

SJIF Impact Factor(2024) : 8.402

ISI I.F.Value : 1.188

ISSN (Online): 2455-3662

DOI : 10.36713/epra2013



EPRA International Journal of

MULTIDISCIPLINARY RESEARCH

Monthly, Peer Reviewed (Refereed) & Indexed International Journal

Volume - 10 Issue - 3 March 2024

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ISSN (Online) : 2455 - 3662
SJIF Impact Factor(2024) :8.402
ISI I.F. Value : 1.188
DOI : 10.36713/epra2013



EPRA International Journal of
**Multidisciplinary
Research**

Monthly Peer Reviewed & Indexed
International Online Journal

Volume: 10 Issue: 3 March 2024

Indexed By:



 Published By :EPRA Publishing

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EPRA International Journal of Multidisciplinary Research (IJMR)

Peer Reviewed Journal|| Journal DOI URL: <https://doi.org/10.36713/epra2013>

CONTENTS

S.NO	TITLE	AUTHOR/S	PAGES
1.	DEVELOPMENT OF CONTEXTUALIZED COMIC LEARNING MATERIALS IN EARTH AND LIFE	Alice T. Rivera, PhD, Benedict M. Turno, MEd	1-7
2	ASSESSMENT OF THE LIFE QUALITY OF PERSONS WITH KNEE JOINT INJURIES AFTER SURGERY INTERVENTION	Botirov K.Farkhod, Mavlyanova F.Zilola, Kim A.Olga, Shamsiddinova Sh. Madinabonu, Ashurov F. Rustam	8-12
3	REDISCOVERING THE HIDDEN COMMONWEALTH WAR GRAVES CEMETERY IN THE BUNDELKHAND REGION Commonwealth War Graves Cemetery at Jhansi	Shireen Comfort	13-17
4	THE SCIENCE OF WORK INTAKE: PROCESS OPTIMIZATION AND HUMAN-COMPUTER INTERACTION METHODOLOGIES IN CALL CENTER ENVIRONMENTS	Sreedhar Srinivasan	18-20
5	THE IMPORTANCE OF IMAGES AND SYMBOLS IN FICTION LITERATURE	Sarsenbaeva Zoya Jangabay kizi	21-23
6	TEXT AND WAYS OF STUDYING IT IN PUBLICISM	Tureshova Sarbinaz Muratovna	24-26
7	IMPROVING THE DIGITAL PAYMENT EXPERIENCE: A CUSTOMER-CENTRIC APPROACH TO PROBLEM SOLVING	Ramanatha A, Ramya M, Prameela N, Shivaprasad S	33-38
8	SYNTHESIS, SPECTROPHOTOMETRIC AND CHROMATOGRAPHY TECHNIQUES OF CRUDE OIL AND PETROLEUM PRODUCTS	Santosh Namdeo Upare , Dr. J. Sai Chandra	39-45
9	SORPTION ISOTHERM AND QUALITY ASSESSMENT OF CHICKEN JERKY	Oluwatoyin Folake Alamuoye, Nathaniel Olu Alamuoye, Lawrence Kunle Otitoju	46-53
10	A STUDY ON CUSTOMER PERCEPTIONS OF THE EFFECTIVENESS OF PROMOTIONAL TOOLS ADOPTED BY THE BANK	Reeta Pant , Dr. H.R. Kaushal	54-59
11	PHYSICS EDUCATION TECHNOLOGY (PHET) INTERACTIVE SIMULATIONS AS TEACHING AID IN ENHANCING STUDENTS' PERFORMANCE IN PHYSICS	Melvin C. Eleo, Ylcy B. Manguilimotan	60-64
12	METHODOLOGY OF IMPROVING NONVERBAL COMMUNICATIVE COMPETENCE OF PHYSICAL EDUCATION STUDENTS	Sarsenbaev Dauran Jangabay Uli, Urazimbetova Mardjna Sultamuratovna	65-68
13	EMPOWERING RURAL WOMEN: A CLOSER LOOK AT THE IMPACT OF MICROFINANCE SERVICES	Riya Banerjee	69-70

14	THE USER INTERFACE AND USER EXPERIENCE DILEMMA IN DIGITAL PAYMENTS: A CUSTOMER-FOCUSED ANALYSIS	Ramanatha A, Mallika S	71-76
15	PAKIKIHAMOK NG MGA BSED-FILIPINO PRE-SERVICE TEACHERS SA PAGBABALIK NG IN-PERSON PRACTICUM: ISANG KWALITATIBONG PANANALIKSIK	Conie B. Cerna, Shirrey Ian B. Abueva PhD	77-83
16	OUT-OF-FIELD SPECIALIZATION TEACHING	Jenny Rose Oronos-Tumacder, Samantha Lalican Policarpio	84-93
17	LINGUISTIC LANDSCAPE OF FRENCH LANGUAGE IN TOURISM EDUCATION	Dr. J. Eugene	94-97
18	THE EMPLOYMENT RATE AND EMPLOYABILITY STATUS OF BACHELOR OF SCIENCE IN OFFICE ADMINISTRATION GRADUATES FROM ACADEMIC YEAR 2018 TO 2019: A TRACER STUDY	Sherlyn Mae T. Lopez, April Mae T. Callo, Jonelson C. Escandallo PhD	98-108
19	CREDIT CARD FRAUD DETECTION USING MACHINE LEARNING ALGORITHMS	K.Kowsalya , Mrs.Vasumathi, Dr.S.Selvakani	109-116
20	BRIDGING HERITAGE: A COMPARATIVE ANALYSIS OF TOURISM DEVELOPMENT AT BUDDHIST PILGRIMAGE SITES IN UTTAR PRADESH AND BIHAR	Shushant Kumar Kushwaha	117-120
21	PANORAMIC REVIEW OF DISTAL RADIUS FRACTURES	Bryam Esteban Coello Garcia, Adriana Nicole Bano Cando, Maria Del Cisne Vega Cobos, Jocelyne Estefania Arevalo Arcentales, Jonnathan Efren Espinoza Calle, Hjalmar Roberto Moran Romero	121-129
22	ANALYZING SOCIAL PREJUDICE THROUGH LANGUAGE PARADIGM: THE SITUATION OF THE LGBTQIA+ MEMBERS	Kirck Michael Britos De Leon, Celso P. Resueno Jr	130-137
23	THE MEDIATING EFFECT OF MATH RESILIENCE ON THE RELATIONSHIP BETWEEN MATH SELF-EFFICACY AND STUDENT ENGAGEMENT IN MATHEMATICS	May Christine C. Digamo, Emmanuel P. Abuzo	138-145
24	ISSUES OF RE-CREATION OF HISTORICAL-NATIONAL IDENTITY IN THE GERMAN TRANSLATION OF	Abdurakhmonova Dilrabo	146-147
25	THE PLACE OF IBN SINO'S THEOLOGY IN THE HISTORY OF PHILOSOPHY	Ramzjon Isakdjanov	148-151
26	THERMODYNAMICS V/S HUMAN DYNAMICS : AN INTERESTING COMPARISON FROM TEXT TO CONTEXT	Sunil K T, Aiswarya M	152-154
27	TRADE WINDS: AN IN-DEPTH EXPLORATION OF INDIA'S IMPORTS FROM CHINA AND IMPLICATIONS FOR BILATERAL RELATIONS	Ms. Zeba Khan	155-159
28	LITTLE MILLETS EXPORTS-AN ANALYSIS	Dr. M. Vanishree Mam, Dr. G. B. Karthikeyan, Mr. B. Mohammed Fardheen Khan	160-163
29	ROLE OF AGRICULTURE AND ALLIED SECTORS IN INDIAN ECONOMY- SOME	Shareya, DD Sharma, Vandita Sharma	164-166

	CHALLENGES		
30	A LINGUISTIC SURVEY OF BOTANICAL TERMS	Sultonova Kibriyo	167-169
31	MANAGEMENT OF BREAST CANCER IN ECUADOR DURING THE COVID-19 PANDEMIC	Priscilla Lizbeth Perez Jaramillo, Jenniffer Betzabeth Montoya Alcivar, Nathaly Elizabeth Salinas Quito, Franklin Vinicio Fajardo Lapo, Edgar Cristhelier Zambrano Ramirez, Darling Estefania Argudo Jima, Jerson Amado Ochoa Asanza	170-174
32	COMPARATIVE ANALYSIS OF COSTS AND RETURNS ACROSS FARM SIZES FOR SUGARCANE PRODUCTION IN MANDYA DISTRICT, KARNATAKA	Manju K, Dr.M.V Dinesha	175-180
33	GROUNDWATER AND ECOSYSTEMS: UNDERSTANDING THE CRITICAL INTERPLAY FOR SUSTAINABILITY AND CONSERVATION	Mustaq Shaikh, Farjana Birajdar	181-186
34	EXPLORING THE PSYCHO-SOCIAL DYNAMICS: EXAMINING THE EFFECT OF ASSERTIVENESS TECHNIQUE ON LOW ACADEMIC SELF-CONCEPT AMONG SECONDARY SCHOOL STUDENTS	Obianuju Blessing Mokwelu, Anulika Valentina Etele, Uju Christiana Nwanna, Onyeisi Lucky Ogben	187-192
35	DEVELOPMENT OF ALOE VERA HAND SANITIZER	Lewelyn Christine H. Palmero	193-198
36	MENTAL HEALTH PROMOTION IN THE WORKPLACE: STRATEGIES FOR OCCUPATIONAL HEALTH NURSES	Ambily Joy	199-203
37	OCCUPATIONAL NOUNS DENOTING GENDERALOGIC MEANING IN ENGLISH	Khujaeva Sayyora Sotimboyevna	204-206
38	SEMANTIC REPRESENTATION OF THE CONCEPT LEADERSHIP IN THE NOVEL CALL OF THE WILD BY J.LONDON	Ermetova Jamila Ismailovna , Babajanova Yulduz Igorovna	207-211
39	THE ROLE OF SMART CITY POLICY IN IMPROVING THE QUALITY OF LIFE IN SERANG CITY BANTEN	Mulyadi, M.Harry Mulya Zein	212-214
40	THE FUNCTIONAL ESSENCE OF ORATORY	Aziza Khasanovna Aripova	215-219
41	NOMADS IN THE LOWER SYRDARYA BASIN AND ISSUES OF THEIR RELATIONS WITH THE KHOREZM OASIS	Makhmudov Umrbek Bakhtiyorovich	220-225
42	NARRATIVE POLYPHONY IN LITERARY DISCOURSE	Dilorom Sabirova	226-228
43	A STUDY TO ASSESS THE EFFECT OF STRUCTURED TEACHING PROGRAM ON KNOWLEDGE REGARDING CERVICAL CANCER AMONG ANM STUDENT IN SELECTED NURSING SCHOOL (M.P.)	Shailendra Chandelkar	229-241
44	AN EXAMINATION OF INDIAN LIFE INSURANCE SECTOR	Vikas Sharma	242-248
45	TEACHER EMOTIONAL SUPPORT AND PARENTAL EXPECTATION AS PREDICTORS OF STUDENTS' ATTITUDES TOWARD LEARNING MATHEMATICS	Mary Rose G. Rentuya, Paulino P. Tado PhD	249-254
46	PAGDALUMAT SA HAMONG KINAKAHARAP NG MGA GURO SA FILIPINO 7 SA KAKULANGAN SA REHIYONAL NA AKDANG	Fatimae S. Villarasa, Susan B. Dipolog PhD	255-263

	PAMPANITIKAN		
47	A REVIEW ON: ROLE OF ORGANIC FARMING FOR SUSTAINABLE AGRICULTURE PRODUCTION	Vikhe A.S, Gadekar C.S, Chechare C.V, Ajabe P.G	264-266
48	STUDY ON THE USE OF GARLIC EXTRACT (ALLIUM SATIVUM) IN LOWERING DYSLIPIDEMIA LEVELS IN MALE WISTAR RATS CONSUMING A HIGH-FAT DIET AND PROPYLTHIOURACIL.	Wu Dawei, Suhartina	267-272
49	DECOMPOSING REVENUE SOURCES OF MUNICIPALITIES	Lalthlamuana Ralte, Prof. Lalhriatpuii	273-280
50	DESIGN, SYNTHESIS AND ANTIMICROBIAL EVALUATION OF NEW ISATIN-MOXIFLOXACIN BASED 1,2,3-TRIAZOLE COMPOUND	Nisha Kumari, Shailendra Petel, Arun Patel	281-292
51	SYNTHESIS, CHARACTERIZATION AND ANTIMICROBIAL EVALUATION OF SOME NEW 4(3H)-QUINAZOLINONE	Pankaj Kumar, Arun Patel, Shailendra Patel	293-306
52	THE ROLE OF ARTIFICIAL INTELLIGENCE IN PERSONALIZED MARKETING	Kavita Rani	307-308
53	ATTITUDE OF PARENT'S TOWARDS THEIR MENTALLY RETARDED CHILDREN	Mrs. Bhagyashree Nayak	309-312
54	MULTISECTORAL CAPABILITIES IN IMPLEMENTING THE JUVENILE JUSTICE AND WELFARE ACT: A COMPARATIVE ANALYSIS TOWARDS ENHANCED COMPETENCIES	Wennie Ann A Cale	313-322
55	STUDY OF EFFECTIVENESS OF TURMERIC ETHANOL EXTRACT (CURCUMA LONGA) AS AN ANTI-DYSLIPIDEMIA AGENT IN MALE WISTAR RATS EXPOSED TO PROPYLTHIOURACIL	Ling Jinmei, Wienaldi	323-329
56	THE LIVED EXPERIENCE OF SELECTED FILIPINO FEMALE SOLO PARENTS OF CHILDREN WITH AUTISM SPECTRUM DISORDER DURING A STATE OF HEALTH EMERGENCY	Jessica Chisa D. Berdan, John Mark S. Distor	330-333
57	THE IMPORTANT ROLE OF REVERENCE IN MYANMAR SOCIETY	Gunasettha , Dr. Yeshpal	334-336
58	THE ROLE OF BUDDHISM IN MYANMAR'S CULTURAL IDENTITY	Ardiccaramsi , Dr. Yeshpal	337-339
59	EXPLORING THE SOCIO-DIMENSION OF BUDDHISM: A PATH TO HARMONY AND COMPASSION	Varanyana , Dr. Yeshpal	340-342
60	SMART CITY EMERGENCY COMMUNICATION OVER HILLY AND FOREST REGION WITHIN NETWORK COVERAGE	K. Madhumitha, R. Prakash, S. Sudha, V. Hemalatha	343-345
61	TUNNING OF PHOTOCATALYTIC PERFORMANCE OF CRO4-ZRO2 NANOCOMPOSITE MATERIAL FOR THE EFFECTIVE DEGRADATION OF INDUSTRIAL DYES	K. Subashri	346-359
62	EMBRACING BUDDHIST ETHICS: A PATH TO HARMONIOUS LIVING IN DAILY LIFE	Tiloka, Dr. Yeshpal	360-362
63	A STUDY OF SALES PROMOTION	Vijay Singh Thakur	363-367

	SCHEMES AND CONSUMER BUYING BEHAVIOUR OF SELECTED ORGANIZED FOOD RETAIL STORES IN BHOPAL CITY		
64	EXPLORATION OF SOCIAL REALITY AND POSITION OF WOMEN IN VIJAY TENDULKAR'S KAMALA	Purna Chandra Haldar	368-370
65	A STUDY ON RURAL WOMEN'S ECONOMIC EMPOWERMENT IN ODISHA'S JAJPUR DISTRICT	Sudeshna Mishra	371-373
66	EVALUATION OF THE EFFECTIVENESS OF TURMERIC (CURCUMA LONGA LINN) METHANOL EXTRACT AS A PAIN RELIEVER AND FEVER REDUCER IN MALE WISTAR RATS	Chen Jiafei , Florenly	374-380
67	A STUDY ON DIURNAL ACTIVITIES OF CAPTIVE CHIMPANZEES FROM THE ZOOLOGICAL GARDEN ALIPORE, INDIA	Debojyoty Ghosh	381-383
68	ON THE ISSUE OF CLASSIFICATION OF ANOPHTHALMOS	A.F. Yusupov, D.Kh. Khodzhaev	384-386
69	THE MEDIATING EFFECT OF ATTITUDES TOWARDS MATHEMATICS ON THE RELATIONSHIP BETWEEN ACADEMIC SELF-EFFICACY AND MOTIVATION TO LEARN MATHEMATICS	Jenifer C. Comahig, Emmanuel P. Abuzo	387-393
70	ANALYSIS OF FACTORS AFFECTING EXCLUSIVE BREASTFEEDING AT KIA POLYCLINIC ROYAL PRIMA HOSPITAL MEDAN	Shao Liyang, Johannes Bastira Ginting	394-398
71	ANALYSIS OF EYE PROSTHETICS SERVICE IN THE REPUBLIC OF UZBEKISTAN	Yusupov A.F., Khodjaev D.Kh	399-403
72	BEYOND LIKES AND SHARES: HOW SOCIAL MEDIA SHAPES VOCABULARY ACQUISITION	Pauline Joy Gelacio Tardaguila	404-408
73	ISSUES OF ACTING IN NATIONAL CINEMA ART: STYLE AND INTERPRETATION	Ilhom Sadikov	409-411
74	EVALUATION STUDIES EFFECTIVENESS OF PROFESSIONAL ACTIVITIES OF RESCUE DIVERS	Sh.E.Kurbanbayev ,A.A.Mardonov	412-413
75	APPLICATION OF NEW PEDAGOGICAL TECHNOLOGIES TO SOLVE DIDACTIC ISSUES	N. A. Nasirova	414-416
76	GENDER INCLUSION AND DEVELOPMENT OPPORTUNITIES FOR WOMEN IN CURRENT SCENARIOS	Husenasab Vanageri	417-419
77	BIOTOPE FEATURES OF OILSEED CROPS, BIOECOLOGY OF DEVELOPMENT OF PEST SPECIES, THEIR DAMAGE	Toreniyazov E.Sh, Sultanbaeva F.A	420-423
78	PRODUCTION TECHNOLOGY OF ACETONE PRODUCT DERIVED FROM ACETYLENE	Omanov Bekhruzjon Shukhrat ugli, Khatamova Mukhabbat Sattarovna, Adizqulova Oftob Ulug'bek qizi, Islomova Gulshoda Farhod qizi	424-427
79	INSIGHTS INTO BODY DONOR'S ATTITUDES AND PERSPECTIVES; A SURVEY ON VOLUNTARY BODY DONATION	Dr Arpitha S, Dr Sireesha S R, Dr Uma B Gopal	428-431

80	A COMPREHENSIVE REVIEW OF HERBAL FACE SERUM	Miss. Gauri Deshmukh, Miss. Vaishnavi Katkar, Mr. Sanjay Garje, Mr. Gaffar Sayyad	432-437
81	LEARNING STYLES AND MATHEMATICAL DISPOSITIONS AS PREDICTORS OF THE CRITICAL THINKING SKILLS OF JUNIOR HIGH SCHOOL STUDENTS	Elmer S. Morial, Emmanuel P. Abuzo	438-443
82	A STUDY ON TRENDS AND GROWTH OF PUBLIC AND PRIVATE SCHOOL EDUCATION IN KARNATAKA	Umesha K , Dr. Mahesha M	444-450
83	THE RELATIONSHIP OF BACK FITNESS, MUSCLE STRENGTH ARM AND HAND STRIP ON THE SPEED OF THE O GOSHI TECHNIQUE IN JUDO ATHLETES IN BANDAR LAMPUNG	Aldo Krisdiantoro, Hari Yulianto, Dawam Ashidiqie	451-456
84	A NOVEL MICRO CONTROLLER BASED MULTI FOOD FLOUR MAKING MACHINE	Pradeep M, Karthika, Sangeetha, Ayyappa Srinivasan M G	457-459
85	UNLEASHING NATURE'S POTENTIAL THROUGH PHYTOREMEDIATION STRATEGIES TO COMBAT HEAVY METAL POLLUTION: A REVIEW	Vikas Kumar, Sandeep Kumar Tyagi, Ravindra Singh Parmar	460-464
86	QUALITY OF LIFE PRIME RANKINGS AND REVIEW OF EVIDENCES	L.B Ngoze, Prof. Lalhriatpuii	465-469
87	DELVING INTO THE PEDAGOGICAL TRANSITIONS OF PRE-SERVICE TEACHERS TO NEW NORMAL: INDIVIDUAL DIFFERENCES OF ELEMENTARY LEARNERS IN FOCUS	Estella Marie P. Alicante-Martel	470-480
88	A NOVEL IOT BASED AIR AND WATER QUALITY MONITORING SYSTEM	Rabi Arunachalam, Muthu Ganesan, Ayyappa Srinivasan M G	481-486
89	SMART ECG MONITORING SYSTEM DRIVEN BY IOT	Ajishlin.P.S, Mukesh.P	487-491
90	E-WASTE MANAGEMENT WITH IOT DEVICES	Mari Kannan M, Arun Kumar R	492-496
91	MICRO CONTROLLER BASED VOLTAGE PROTECTION SYSTEM	Vidyashree, Varshny	497-499
92	MORPHOGENETIC, AGROPHYSICAL, MECHANICAL COMPOSITION AND PROPERTIES OF SOILS OF THE DRIED BOTTOM OF THE ARAL SEA	Oteuliyev Jaksilik Begdullayevich, Dozhanov Kilishbay Jienbayevich,Alpisbaeva Akmaral Jubatkhanovna	500-502
93	PAGGALUGAD SA MGA ESTRATEHIYA NG MGA GURO SA FILIPINO SA Pagsulat ng Sariling Kathang Storybook: Isang Kwalitatibong Pag-aaral	Heide Mae S. Tero, Susan B. Dipolog PhD	503-510
94	ARTIFICIAL INTELLIGENCE AND INNOVATION MANAGEMENT: TRANSFORMATIVE FORCES SHAPING ORGANIZATIONAL CREATIVITY	Yasmin Mirzani	511-518
95	IMAM MATURIDI'S CONTRIBUTION TO THE FORMATION OF THE SCIENCE OF AQIDAH	Usmonov Iskandar Foziljonovich	519-521
96	FORM AND METHODS OF EFFECTIVE USE OF PERSONALIZED PEDAGOGICAL TECHNOLOGIES IN HIGH SCHOOLS	Shukurov Yo.A	522-525
97	PSYCHOLOGICAL STUDY OF THE	Khudaiberganov	526-530

	RELATIONSHIP OF THE LEVEL OF AGGRESSIVENESS AND VALUE ORIENTATIONS IN ADOLESCENTS		
98	PANORAMIC REVIEW OF MANAGEMENT, CONSERVATIVE TREATMENT AND SHOULDER REDUCTION TECHNIQUES	Bryam Esteban Coello Garcia, Jessica Alexandra Parra Mejia, Carolina del Carmen Velez Andrade, Geovanna Karolina Cazorla Andrade, Juan Ignacio Cobos Calle, Lucy Paulette Zumba Rios, Darwin Ismael Cajas Pelaez, Veronica Yajaira Valencia Canar	531-537
99	ORGANIZATIONAL COMMITMENT: BOOSTING INNOVATION THROUGH KNOWLEDGE SHARING	Anastasia M D Batmomolin, Justine Tanuwijaya, Bahtiar Usman	538-547
100	INCLUSIVE MATHEMATICS CLASSROOM PRACTICES FOR CHILDREN WITH DIVERSE LEARNING NEEDS FROM THE PERSPECTIVE OF COGNITIVE LOAD THEORY	Trisha Banerjee, Dr. Manish Kumar Gautam	548-555
101	KARANASAN NG MGA GURO SA PAGGAMIT NG METAKOGNITIBONG PAGBASA SA PAGTUTURO NG FILIPINO: ISANG PENOMENOLOHIYANG PAG-AARAL	Ansar D. Amiang, Diza M. Rolida	556-563
102	INTRODUCTION TO THE THEORY OF INTERTEXTUALITY: HYPERTEXTUALITY AND METATEXTUALITY FROM A DIFFERENT PERSPECTIVE	Riyad Abdurahman Manqoush Ph.D	564-571
103	ANALYSIS OF RAINFALL TREND USING NON- PARAMETRIC METHODS AND INNOVATIVE TREND ANALYSIS TECHNIQUE DURING 1901-2019 IN ODISHA	Mr. Suraj Kumar Behera	572-578
104	A STUDY OF CORPORATE SOCIAL RESPONSIBILITY (CSR) IN EASTERN COALFIELDS LIMITED (E.C.L)	Sneha Banerjee, Gourov Kanjilal	579-582
105	LEGAL REVIEW IN ASSESSING THE IMPLEMENTATION OF INFECTION CONTROL PLANNING AND PREVENTION (PPI) PROGRAM IN RSU ROYAL PRIMA MARELAN IN 2024: EVALUATION OF LEGAL ASPECTS IN HEALTH MANAGEMENT	Li Hongye	583-587



DEVELOPMENT OF CONTEXTUALIZED COMIC LEARNING MATERIALS IN EARTH AND LIFE

Alice T. Rivera, PhD, Benedict M. Turno, MEd

Nueva Ecija University of Science and Technology

ABSTRACT

The research focused on developing a Contextualized Comic Learning Materials in Earth and Life Science as a means to enhance student learning and improve teaching delivery. The study follows the Research and Development (R&D) model by Gay (1990) and consists of five stages: literature study, planning, development and validation of the prototype, revising prototype empirical test, and dissemination and implementation.

The findings of the study demonstrate that teachers strongly agree with the clarity of expression and explanations, relevance to real-life situations, statements of desired learning outcomes, and organization of the content of the contextualized comic learning material. Additionally, student respondents have positive responses towards the visual appeal and content of the material.

This research suggests that Contextualized Comic Learning Materials in Earth and Life Science can be implemented as innovative learning materials to supplement Science instruction. However, further research is needed to fully understand the impact of contextualized comic material when used as a supplementary material.

KEYWORDS; Comic, Contextualized, Development, Learning Materials.

I. INTRODUCTION

The field of education is constantly evolving, with educators seeking innovative and engaging approaches to enhance student learning and understanding. With the use of instructional materials and the right approach, it can certainly help in making lessons interesting and useful in increasing students' understanding. Instructional materials enhance the teaching/learning process by exhibiting information necessary to acquire knowledge and skills. Instructional materials are meant to improve the quality of education for effective academic performance of students in schools [3].

Meanwhile, contextualization is an incredible technique steering learners' interest in exploring the content in a meaningful and relevant setting. The application of contextualized learning strategies and the development of interactive alternative learning materials is seen as a good strategy to introduce and perform difficult topics or lessons [11]. With contextualization, teachers can present the lesson in a more meaningful and relevant context based on the learner's previous experiences and real-life situations [6]. Contextualizing instructional materials ensures that learning experiences are relevant, meaningful, and accessible to diverse learners and learners can better understand, connect, and apply what they learn, leading to improved learning outcomes and increased engagement.

One of the emerging contextualized learning materials is the use of comics as an educational resource. Comic materials present information in a visually appealing and narrative-driven format, offering a more immersive and interactive learning experience.

Comics usually contain cartoons, presented in a simple, concise, and easily understood because it is equipped with dialogue between characters [18]. If the subject matter is designed in such a way as a comic, then in addition to be a medium of entertainment, comics can also be used as learning media. In the study of Le Doux, et.al. (2016), findings revealed that comics are the right media for learning because the emotional involvement of readers will significantly affect the memory and recall of the subject matter that is obtained. Additionally, comics are learning media that can attract student attention. Simple drawings and dialogue between characters make it easy for students to understand the contents of the story so that comics can be used as informative and educative media for students [12]. In recent years, research has shown that incorporating visual and interactive materials in teaching can significantly improve student comprehension and retention rates. Nurdin, Risnawati, and Ayurila (2019) suggested that the use of appropriate learning media in learning can improve students' knowledge, motivation, and interest in education.

Thus, this research focuses on the creation and evaluation of educational comic materials specifically tailored for the subject areas of Earth and Life Science sought to bridge the gap between abstract concepts and real-life applications, making learning more relatable and accessible to students. The study aimed to explore the potential of comics in facilitating conceptual understanding and engagement for students in these disciplines and to align with the curriculum for Earth and Life Science, highlighting important concepts, processes, and phenomena through engaging visuals and thoughtful storytelling.



Moreover, by designing and evaluating contextualized comic materials, this study also aimed to offer educators a valuable resource that can improve teaching practices and promote student interest and understanding in these important science disciplines.

The following objectives of this study have been accomplished by the researcher.

- To design and develop of the Contextualized Comic Learning Materials in Earth and Life Science align with curriculum
- To ensure the quality of developed Contextualized Comic Learning Materials in Earth and Life through teacher and student's evaluation of its clarity of expression and explanations; statements of desired learning outcomes; organization of the content of the comic and relevance to the life situation
- To provide information about the strengths and weaknesses of the developed contextualize comic learning materials in Earth and Life Science in terms of its visual appeal and content.

II. METHODOLOGY

2.1 Research Design

This study employed the developmental research design. Developmental research is a systematic study of design development and evaluation process with the aim of establishing an empirical basis for the creation of instructional and non-instructional products and tools and new or enhanced models that govern development (Richey & Klein, 2013). The contextualized comic learning materials in Earth and Life Science developed according to the Research and Development (R&D) procedure proposed by Gay (1990) with the following steps: literature study, planning, development and validation of the prototype, revising prototype, empirical test, and the final stage is dissemination and implementation.

Quantitative approach was also utilized in evaluating the Contextualized Comic Learning Materials in Earth and determine its strength and weakness in terms of visual appeal and content.

2.2 Research Instrument

The study utilized two sets of questionnaires to gather data from the respondents. The first questionnaire was adapted from Bulalayao (2011) and was employed to assess the developed instructional material in terms of its clarity of expression and explanations, relevance to the life situation, statements of desired learning outcomes; and organization of the content of the contextualized comic learning material. A four-point Likert was utilized to carefully examine the extent to which the resource meets the criteria.

Meanwhile, the second questionnaire utilized used is for identifying the strengths and weaknesses of the contextualized comic material in terms of content and visual appeal. The questionnaire adapted a four-point Likert scale which comprised of 12 item statements to be responded to as strongly agree/slightly agree/agree/disagree.

2.3 Respondents

The evaluation involved thirty Grade 11 students and Science teachers from Camp Tinio National High School (CTNHS). The Grade 11 students assessed the contextualized comic learning materials in terms of their visuals and content. Meanwhile, the all Science teachers from CTNHS rated the materials on factors such as clarity of expression and explanations, relevance to real-life situations, statements of desired learning outcomes, and organization of the content. The teacher-respondents were selected using a purposive sampling technique which targeted specific individuals to suit the purpose of the study. The student's respondents were selected randomly from a total population of 420 students.

2.4 Data Analysis

The quality of the comics was measured based on the assessment provided by the participant at the empirical test. In addition, students' visual ability was also measured after developing the contextualized comic material. The data were analyzed using frequency distribution and weighted mean. Frequency Counts was utilized to show the difference in assessment results. The data were tallied and counted to arrive at a frequency distribution of their organization into tables. Moreover, the weighted of each item statement was used to arrive at the verbal description of the respondent's description of contextualized comic learning materials in Earth and Life Science.

III. RESULTS AND DISCUSSION

3.1 Development of contextualized comic learning materials in Earth and Life Science

The development of the Contextualized Comic Learning Materials in Earth and Life Science adapted the Rand D model instructional development proposed by gay (1990). it underwent five stages namely literature study, planning, development and validation of the prototype, revising prototype, empirical test, dissemination, and implementation.

- **Literature study-** This step involved searching for relevant pieces of literature on the Science contents and the digital aspect for developing contextualized comic learning materials in Earth and Life Science. The researcher carefully scrutinized the module in Earth and Life Science to gather important literature and supplemental materials that will enhance the development of contextualized material
- **Planning. This stage involved** checking the curriculum guide and analyzing the result of the MPS (Mean Percentile Score) to identify the specific topics to be included in the comic materials. This also involved considering secondary data, articles, write-ups, and digestion of literature to come up with the development. Consultations with other science and graphic Illustrators teachers were also a part of the planning stage.
- **Development and validation of the prototype.** In this stage, the contents of the contextualized comic learning materials in Earth and Life were accomplished. Furthermore, the validation of the prototype involved coordination and

consultation with the Science experts and Master teachers and their suggestions and recommendations were employed for

the improvement of the comic material.



Figure1 Sample Illustrations of the developed Contextualized Comic Material

- **Revising prototype.** This stage is the finalization of the developed contextualized learning material considering the experts recommendations. The final copy of the contextualized comic learning materials produced was subjected to teachers' ratings and students' evaluations.
- **Empirical test-** In this stage, the students from Camp Tinio National High School in previewed and assessed developed materials in terms of visual appeal and content of the contextualized comic learning materials in Earth and Life. The contextualized comic learning materials were given to students as supplementary materials for the lessons on animal and plant cells and earth subsystems. The researcher asked the assistance of his co-teacher for the evaluation phase to avoid any biases in the comments acceptance or anything as perceived by the students towards the developed Contextualized Comic Learning Materials in Earth and Life Science. The developed Comic Learning Materials were also subjected to quality assessment by teachers' rating based on the clarity of expression and explanations, relevance to the life

situation, statements of desired learning outcomes; organization of the content of the contextualized comic learning material.

- **Dissemination and implementation-** The developed contextualized comic learning resources was proposed for its utilization as a learning material in Earth and Life Sciences for Senior High School after being accepted and recognized by specialists in the field of Science.

3.2 Teachers' evaluation on contextualized comic learning materials in Earth and Life Science

The table shows that respondents are strongly agreed with the clarity of explanation and expression of the Contextualized Comic Learning Materials in Earth and Life Science with an average weighted mean of 3.63 indicating strong agreement the writing style of comic material, clear discussion of the lesson, and the use of simple illustrations. It can be observed as well that the teachers evaluation strongly agreed with the comic material's statement of desired learning outcomes average having a weighted mean of 3.67. The critical part of instructional materials is the crafting its



objectives and according to Coronacion (2023), a comic often contains specific objectives, experiences, and discussions carried out in sequence and logical [11].

Meanwhile the rating given by the teachers in terms of the organization of the content shown in Table 2. Presented that the highest rating given was 3.73 and the calculated weighted mean was 3.68. This indicating that the teachers strongly agreed that through the Contextualized Comic Learning Materials in Earth and Life Science, students were able to observe independence and self-confidence. Findings also revealed that teachers strongly agree that the organization of the lesson is logical and properly sequenced. Thus, the learning material helped the students think logically and

critically

In terms of the relevance and suitability of the Contextualized Comic Learning Materials in Earth and Life Science to life situations, the results of the findings showed that the comic material was functional, relevant to the student's needs, and the stated objective was suited to the learner's level of mental development. Data shows that the highest rating was 3.77 and the average weighted mean was 3.75. Based on the data, the teachers strongly agreed that the comic material was suitable for learners' mental development, and its functionality in understanding concepts of plant and animal cells and Earth's subsystem.

Table 1. Teachers' Evaluation on Contextualized Comic Learning Materials

1.The Clarity of Expression and Explanations	Weighted Mean	Verbal Description
1.The language of comic material is clear.	3.67	Strongly Agree
2.The writing style of the comic material makes it enjoyable to read.	3.73	Strongly Agree
3. The discussion of the lesson is simple and clear	3.67	Strongly Agree
4. The illustrations used are simple and correct makes the procedure more understandable.	3.67	Strongly Agree
Average Weighted mean	3.63	Strongly Agree
2.2Statement of desired learning outcomes		
9. The objectives are specific, measurable,attainable, reliable and bounded.	3.67	Strongly Agree
10. The interaction at the end of each activity reinforced the basic concepts in plant and animal cells and earth subsystems	3.67	Strongly Agree
11. The illustrations reflects the behavioral objectives in the module.	3.63	Strongly Agree
Average weighted mean	3.67	Strongly Agree
2.3Organization of the content		
12. The organization of the lesson is logical and properly sequenced.	3.60	Strongly Agree
13. The comic learning materials help learners to think logically and critically.	3.70	Strongly Agree
14. Through the comic learning materials students are able to observe independence and self-confidence.	3.73	Strongly Agree
Average weighted mean	3.68	Strongly Agree
2.4 Relevance to the life situation		
15. The comic learning material is functional and relevant.	3.77	Strongly Agree
16. The lesson is relevant and suited to the learner's level of mental development.	3.77	Strongly Agree
17. The stated objective is relevant to the student's needs.	3.77	Strongly Agree
18. The materials used in the activities are available and familiar to the students.	3.77	Strongly Agree
Average weighted mean	3.75	Strongly Agree

3.3 Strengths and Weaknesses of the contextualized comic learning materials in Earth and Life science

Table 2 shows the visual of the developed comic material as perceived by the respondents. The colors of the comic strips used by the proponents were identified as attractive as per the evaluation of the students. Based on the results, the student's respondents strongly agreed the contextualized comic has accurate drawings

and colors as well as the students enjoyed the drawings and enjoyed them as learning material tools in teaching the subject.

The result indicates that the colors used in all frames were inviting to the student's attention and really made them interested to read. Furthermore, way back in old books, it is observed that students tend to look after the combination of colors used made them



interested to read the books. The colors make the comic visual feel alive, not bored quickly, attractive, and beautiful. In both comics, there are some graphic elements such as flowers, light circles, colored spots, and others when emphasizing a story. Student’s respondents claimed:

“ *hindi po boring , nakakaenjoy and mga kulay na ginamit* (the colors used were nice to see, not boring, and fun to look at).

According to Jim (2017) color, or a lack thereof, is an essential storytelling device. Color can stylize a work or evoke an immediate emotion. The right color choice or lighting can contextualize a scene and communicate entire ideas to an audience. Comics are a truncated form of storytelling and when a colorist/artist/creative team understands their toolbox well enough and chooses color as their primary tool in constructing a scene [15].

Table 2: Design of the contextualized comic learning materials

Strengths and weaknesses in terms of visual appeal	Weighted Mean	Verbal Description
1. I can easily understand the message of the strips in the contextualized comic material.	3.29	Strongly Agree
2. The characters/drawings are clearly presented according to the topic.	3.38	Strongly Agree
3. I find the contextualized comic material very useful as I easily comprehend the pictures.	3.56	Strongly Agree
4. The drawings and colors used are accurate.	3.44	Strongly Agree
5. I can easily recognize the lessons through the strips.	3.61	Strongly Agree
6. The drawings and illustrations in the contextualized comic material are enjoyable learning tool.	3.72	Strongly Agree
Average weighted mean	3.50	Strongly Agree

Meanwhile the **Table 3 below shows** the result of the assessment of the content of the developed comic learning materials, which is vividly shown that almost all of the statements got a positive or a perfect response from the respondents. It can be said that the science content of the developed capstone has always played an integral part in learning, skills development, and as context for language study. The texts are interesting and motivating keys to the students which ensure rich and meaningful content. The student’s respondent claimed that:

“*Sana may glossary, Yung parts na nandun yung ibang term* “ (hoping that at the end of the Contextualized Comic Learning Materials In Earth And Life Science there is a glossary for

unfamiliar words with meaning.)

According to Oxford University Press ELT (2014), in today’s fast-moving and increasingly digital world students are less likely than ever before to read or listen to something solely because it’s good for them, or because it contains examples of a particular structure. They are likely to want to know which specific skills they’re working on, but also what information they can take from the text and make use of in their life outside the classroom [16]. A good text needs to be engaging, but it also needs to contain information that remains relevant and useful to the student once the lesson is over. Texts need to provide take-away value both in terms of linguistic development and real-world.

Tale 3. Content of the contextualized comic learning materials

Strengths and Weaknesses in terms of Content	Weighted Mean	Verbal Description
1. The words/term used in the strips of developed materials/contextualized comic can be easily recognize.	3.59	Strongly Agree
2. The language used in the developed materials/contextualized comic can be easily understood.	3.40	Strongly Agree
3. The developed learning materials can motivate me in my learning process.	3.26	Strongly Agree
4. The language used in the developed materials motivated me to participate in the discussions.	3.60	Strongly Agree
5. The words/terminology used in the developed materials are appropriate to the drawings.	3.77	Strongly Agree
6. The used of the developed materials is helpful in studying the lessons.	3.71	Strongly Agree
Average weighted mean	3.47	Strongly Agree



4. CONCLUSIONS

Based on the findings derived from this study, the following conclusions were drawn:

1. The development of instructional materials like contextualized comic learning materials is made possible using the research and development (R and D) model.
2. The contextualized comic learning materials possessed the good characteristics of learning material based on the evaluation of the science teachers in terms of their clarity of expression and explanations, statements of desired learning outcomes, and organization of the content of the contextualized comic learning materials. relevance to the life situation.
3. The contextualized comic learning materials have a positive visual appeal and motivating content for students but recognized that contain unfamiliar words, which are taken into consideration for the improvement of the developed comic material.
4. The teachers recognized the use of contextualized comic learning materials in earth and life sciences as effective and innovative supplementary material in teaching science.

5. RECOMMENDATIONS

Based on the findings and conclusions, the following recommendations are offered.

1. Building on the success of the research and development (R&D) model in creating instructional materials like contextualized comic learning materials, it is recommended to continue investing in R&D to create more innovative and effective teaching resources.
2. While the contextualized comic learning materials were evaluated positively in terms of clarity of expression and explanations, it is recommended to further improve the clarity to ensure that all students can easily understand the content.
3. It is suggested to enhance the organization of the content and ensure its relevance to the students' life situations. This will help students connect the material to their daily lives, making it more engaging and relatable.
4. Recognizing that the contextualized comic learning materials contain unfamiliar words, it is important to address this issue by either explaining the meaning of these words within the comic itself or providing a glossary at the end. This will ensure that students are not hindered by unfamiliar vocabulary when using the materials.
5. Given the effectiveness of the contextualized comic learning materials in earth and life sciences, it is recommended to explore the possibility of using similar materials in other subjects as well. This can provide a more holistic approach to learning and engage students in different subjects using a similar interactive and visually appealing format.

6. ACKNOWLEDGEMENT

The author acknowledged the Science teachers and students who participated to this research

7. CONFLICT OF INTEREST

The authors have declared that there is no conflict of interest.

8. SOURCE/S OF FUNDING NA

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ASSESSMENT OF THE LIFE QUALITY OF PERSONS WITH KNEE JOINT INJURIES AFTER SURGERY INTERVENTION

¹Botirov K.Farkhod, ²Mavlyanova F.Zilola, ²Kim A.Olga,
²Shamsiddinova Sh. Madinabonu, ²Ashurov F. Rustam

¹Scientific-Research Institute of Rehabilitation and Sports Medicine, Uzbekistan

²Samarkand State Medical University, Uzbekistan

Article DOI: <https://doi.org/10.36713/epra15973>

DOI No: 10.36713/epra15973

ABSTRACT

The article presents the results of an assessment of the quality of life after staged rehabilitation of patients with combined injury of the knee joint. The study included 78 patient-athletes - men aged from 18 to 35 years (average age 27.8 ± 0.47 years), who had a history of surgical interventions on the knee joints to restore the anterior cruciate ligament and meniscectomy. A comparative analysis in 2 observation groups in the dynamics of rehabilitation therapy according to the psychological component of health showed that in the main group the greatest dynamics of the component were determined by role (emotional state) and social functioning. Less pronounced dynamics were detected in vital activity and mental health indicators.

KEY WORDS: injury, knee joint, surgery, rehabilitation treatment, quality of life, SF-36

1. INTRODUCTION

Injuries are not only a medical problem, but also have great socio-economic significance, since they lead to a high level of disability and medical and social consequences, including disability and mortality. In this regard, injuries become one of the main elements in the structure of the "burden of diseases".

According to the World Health Organization (WHO) "...every year, there 3.5 million people die due to injuries in the world, and more than 5 million injured people become permanently disabled, with 5-8% being cases of sports injuries».

Today, there are large gaps not only in the timely initiation of prevention and restorative and reconstructive measures after surgical interventions on the knee joint, but also in the lack of comprehensive information on statistical indicators, a recording system, data collection, as well as analysis and type of injuries.

2. PURPOSE OF THE STUDY

The purpose of the study was to assess the quality of life after staged rehabilitation of patients operated on for a combined injury of the knee joint.

3. RESEARCH METHODOLOGY

The study included 78 patient-athletes - men aged from 18 to 35 years (average age 27.8 ± 0.47 years), who had a history of surgical interventions on the knee joints to restore the anterior cruciate ligament and meniscectomy. From the total number of athletes, depending on the volume of rehabilitation therapy, 2 groups were formed: main group (MG) - $n=42$ (53.9%) patients, against the background of standard therapy, received treatment according to staged physical rehabilitation programs developed on the basis of the study results; control group (CG) - $n=36$

(46.1%) patients undergoing standard therapy. In terms of gender and age characteristics of the population, the groups were comparable. The average age in the observation groups was: in main group - 26.36 ± 0.65 years; in control group - 27.88 ± 0.47 years.

To evaluate the effectiveness of the developed and proposed program of rehabilitation measures after surgical interventions on the knee joint, a study of the quality of life was conducted using the SF-36 questionnaire. The SF-36 quality of life questionnaire was used to determine the level of physical and psychological health of patients. The questionnaire consists of 36 questions, combined into 8 sections: physical functioning; role functioning due to physical condition; the intensity of pain and its impact on the ability to perform daily tasks, including home and professional activities; general health; vital activity; social functioning; emotional role functioning and mental health. Scores on each scale ranged between 0 and 100, with 100 representing full health. All eight scales were ultimately combined and included in 2 overall questionnaire indicators: physical health (PH) and mental health (MH).

4. DATA ANALYSIS AND INTERPRETATION

The survey was conducted before and after physical rehabilitation in order to comprehensively assess the general condition of the athlete and the operated limb. Low scores on the physical health component indicated that the patient's physical activity was significantly limited by his health status. While low scores on the psychological component indicated the presence of depressive, anxious experiences, mental ill-being due to a knee injury and surgery.

When assessing the psychological component of health in the



main group after completion of the recovery program, positive dynamics were revealed for all studied parameters (Fig.1).

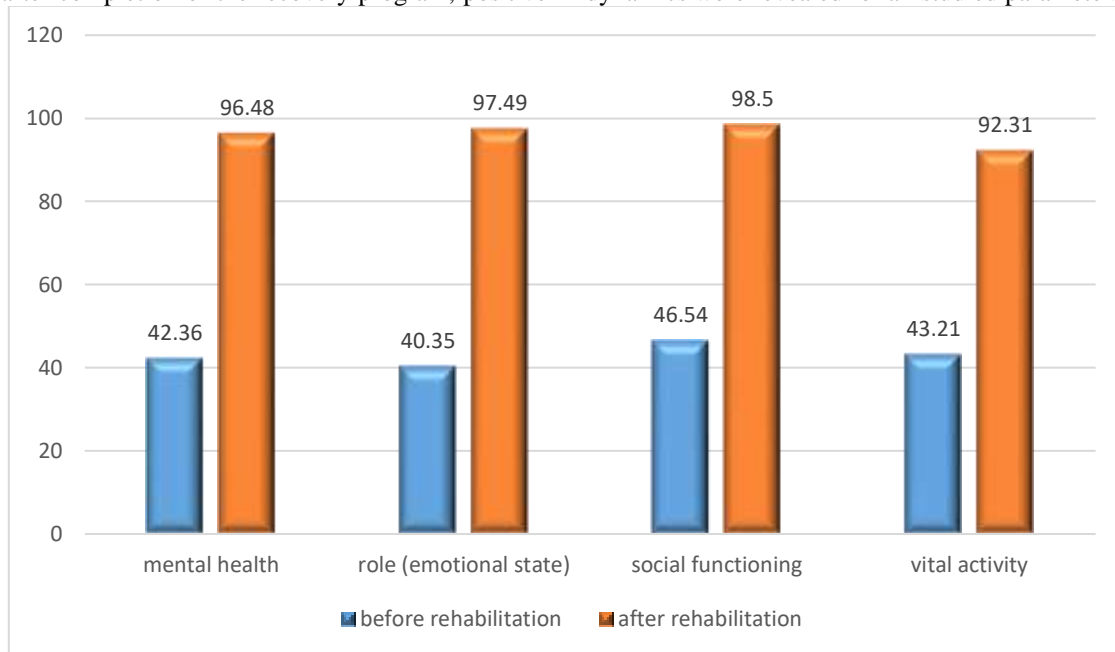


Figure 1. Assessment of the psychological component of health (MH) in the main group, points (n=42)

Total increase in vital activity indicators; social functioning; role functioning due to emotional state; and mental health was 2.24 times. Vital activity increased from 43.21 ± 0.12 points to 92.31 ± 1.24 points. Social functioning also improved markedly, with a score of 46.54 ± 1.23 points before and 98.5 ± 1.26 points after the rehabilitation program. Mental health of participants increased from

42.36 ± 0.38 points to 96.48 ± 1.72 points by the 6th month of the training and recovery period. The indicator of role functioning associated with the emotional state has achieved significant progress: its increase was 40.35 ± 2.11 points to 97.49 ± 2.03 points after a comprehensive rehabilitation program.

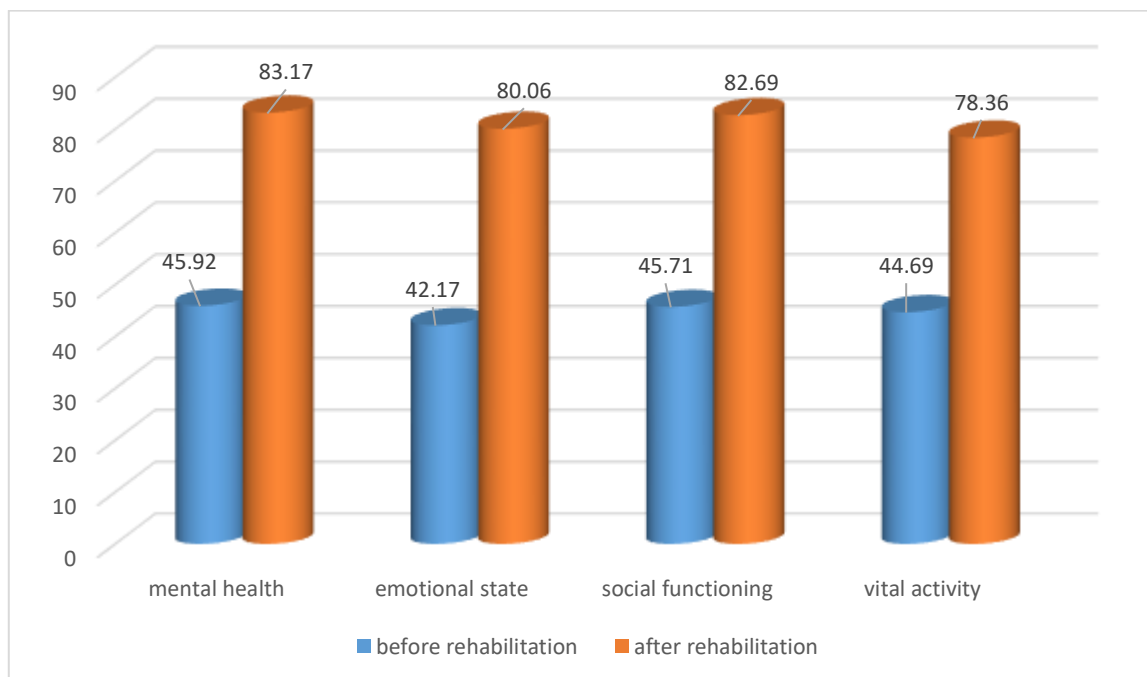


Figure 2. Assessment of the psychological component of health (MH) in the control group, points (n=36)

The results of the study in the control group on the components of psychological health showed an improvement of only 1.82 times after a standard physical rehabilitation program. There was less pronounced dynamics in the indicators of the

psychological component in comparison with the initial level: for example, if the vital activity parameter at the time of inclusion in the study was 44.69 ± 0.37 points, then by the end of 6 months it reached 78.36 ± 0.98 points; social functioning -



45.71±1.68 points and 82.69±1.84 points; role functioning related to emotional state - 42.17±2.64 points compared to 80.06±0.79 points, and mental health - 45.92±0.25 points compared to 83.17±0, 51 points before and after completing the rehabilitation program, respectively (Fig. 2). When assessing the physical component of health in the main group after completion of the recovery program based on general health, athletes give a

lower rating in comparison with their physical sports readiness, which, however, did not affect the assessment of role functioning due to physical condition (with a significant increase in 2.2 times); physical functioning – 1.9 times. The pain intensity indicator changed only 1.4 times, much lower than all other studied components of physical health, which may be associated with internal fear of pain (Fig. 3).

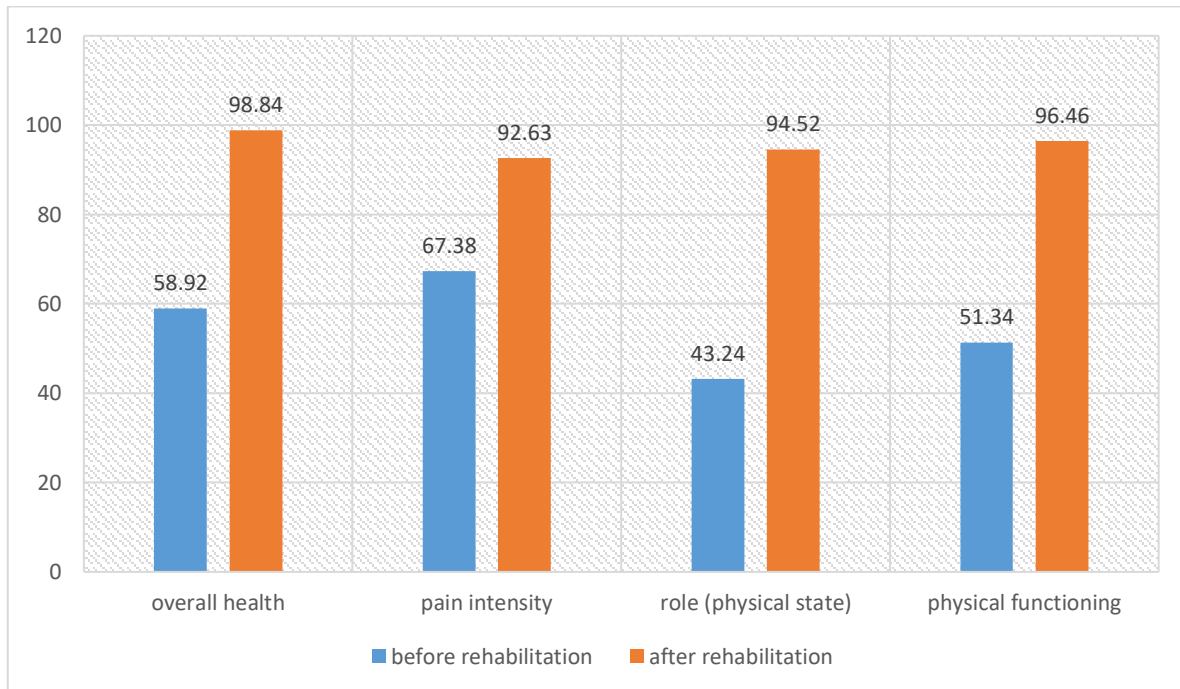


Figure 3. Assessment of the physical component of health in the main group, points (n=42)

Analysis of the dynamics of the studied parameters of the physical component of health in the main group showed that physical functioning at the time of inclusion in the study was 51.34±1.37 points. By the end of the course, after applying a specially developed rehabilitation program, this indicator increased to 96.46±1.62 points. Similar trends were observed when studying other parameters, such as role functioning due to physical condition (43.24±1.23 points before and 94.52±1.51 points after treatment), pain intensity (67.38±2.11 points before and 92.63±0.26 points after treatment), and general health (58.92±2.15 points before and 98.84±3.04 points after the rehabilitation program).

Indicators of the physical component of health among athletes in the control group were significantly lower at the end of the rehabilitation program in all domains. Thus, the parameter of physical functioning before treatment was 53.57 ± 2.17 points, while after applying the standard rehabilitation program at its end it changed only to 76.26 ± 1.35 points. Параметры ролевое functioning (45.28±1.53 points); pain intensity (68.45±2.09 points); general health status (56.22±1.49 points) also after recovery had a slight positive trend and amounted to 74.33±2.48 points; 82.64±1.72 points and 78.71±2.07 points, respectively (Fig. 4).

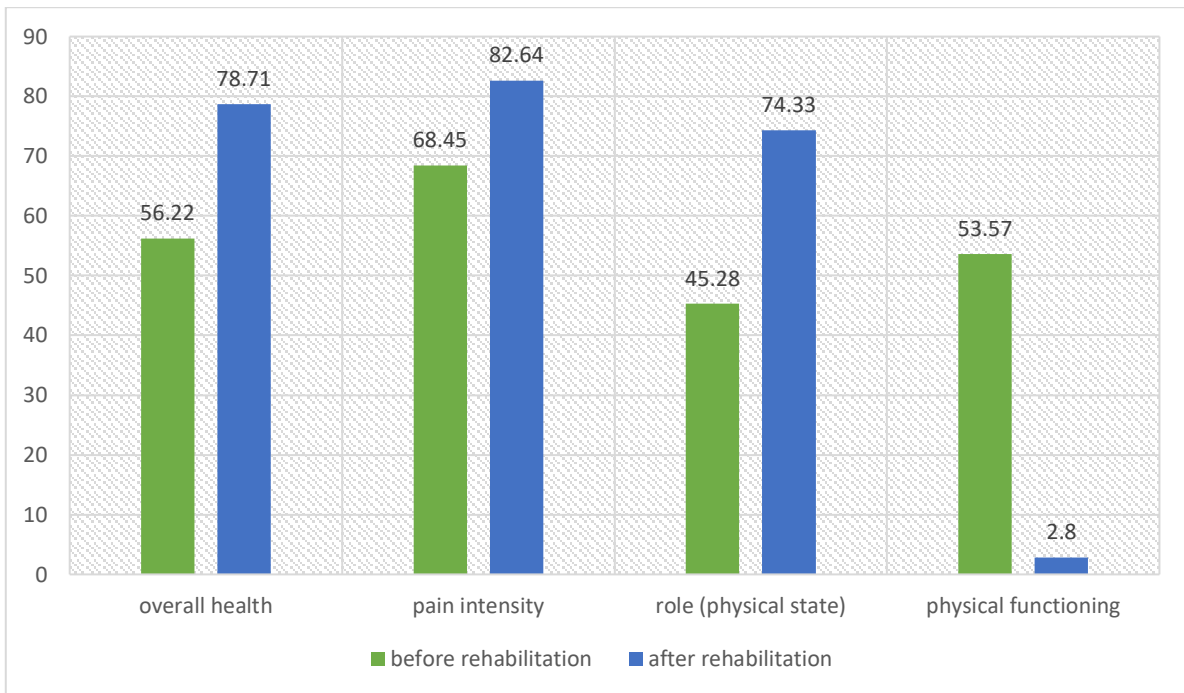


Figure 4. Assessment of the physical component of health in the control group, points (n=36)

In general, when assessing the physical component of health in the control group against the background of standard treatment in comparison with the main group of athletes who received a comprehensive rehabilitation

program, the difference between the studied domains for physical functioning was 20.2 points; in role-playing – 20.19 points; for pain intensity – 9.99 points and for general health – 20.13 points (Fig. 5).

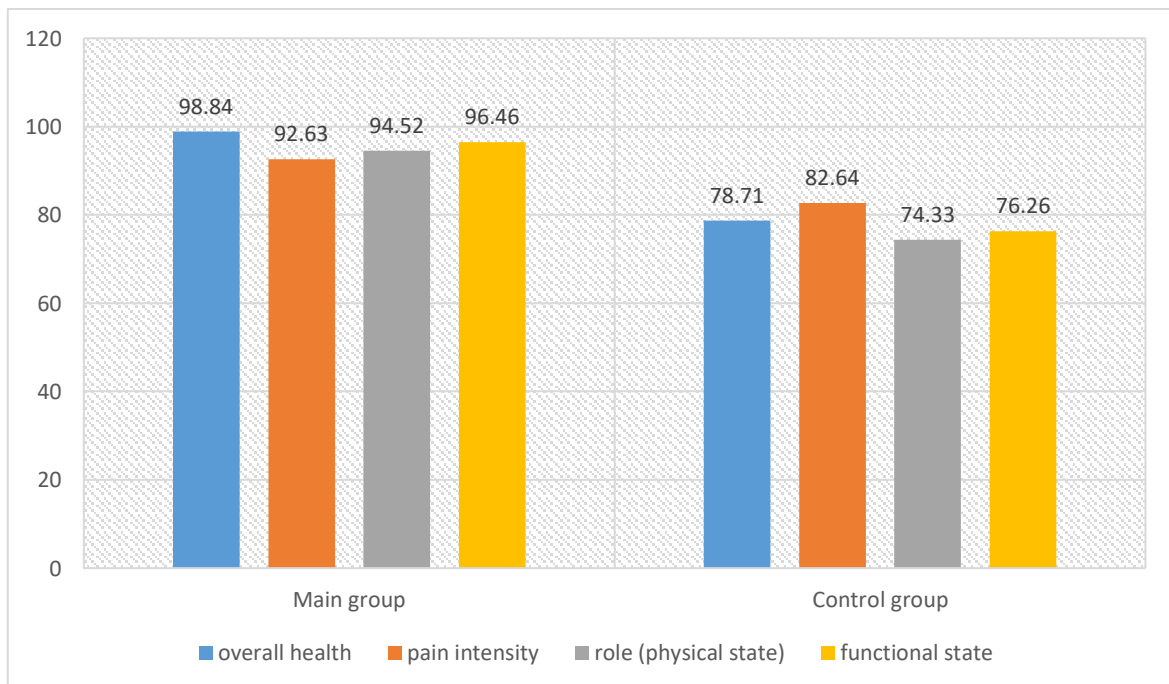


Figure 5. Comparative analysis of the physical component of health in observation groups, points

A comparative analysis in 2 observation groups in the dynamics of rehabilitation therapy in terms of the psychological component of health showed that in the main group the greatest dynamics of the component were determined by role (emotional state) and social functioning, and the difference between the main and

control groups at the end of the training and recovery period was 17.43 points and 15.81 points respectively. Less pronounced dynamics were revealed in the indicators vital activity - 13.95 points and mental health - 13.31 points (Fig. 6).

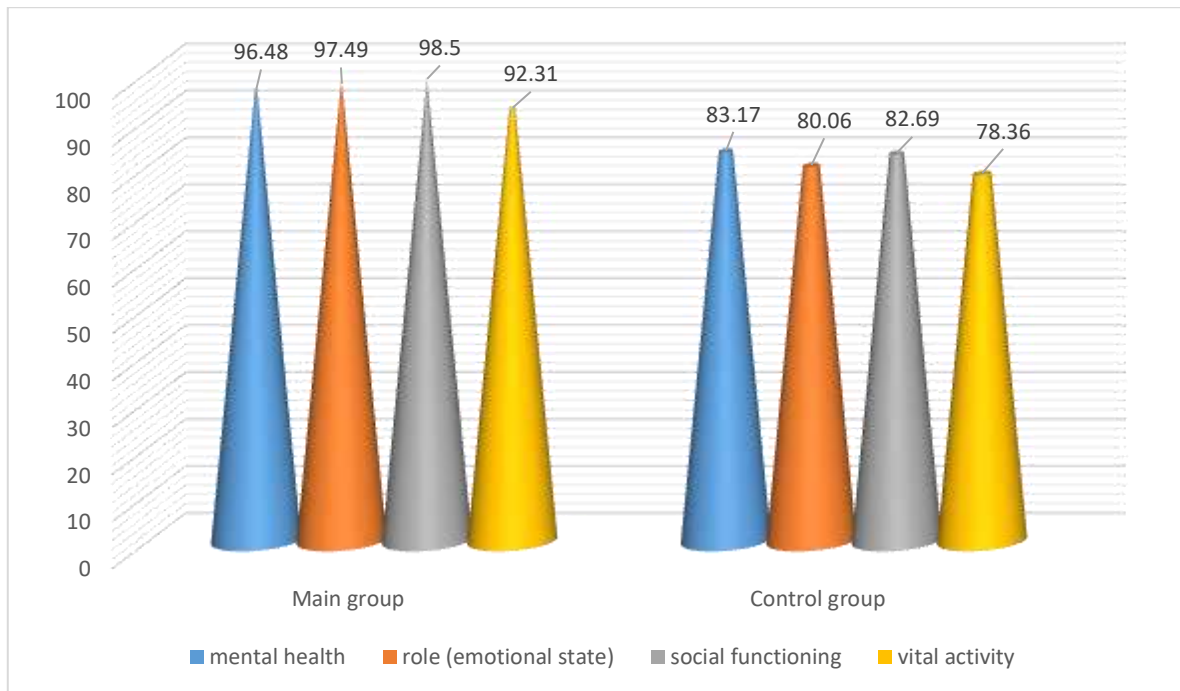


Figure 6. Comparative analysis of the psychological component of health in observation groups, points

5. CONCLUSION

Thus, we can state a significant and reliable improvement in the quality of life, both in the physical and psychological components of health in the main group using a comprehensive program of rehabilitation measures after surgical interventions on the knee joint in the sports contingent. This proves its effectiveness and medical and social significance, since not only the functional activity of the knee joint is restored, but also the psychosomatic status of athletes with the possibility of returning them to the training process in full.

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REDISCOVERING THE HIDDEN COMMONWEALTH WAR GRAVES CEMETERY IN THE BUNDELKHAND REGION

Commonwealth War Graves Cemetery at Jhansi

Shireen Comfort

Barkatullah University

Registration -1340/BU/Acad/Ph.D./202

ABSTRACT

Cemeteries, akin to historic edifices and landscapes, serve as vital links bridging our past with our future. Preservation efforts for cemeteries extend beyond the physical upkeep of grave markers, monuments, and structures; they also foster community unity by paying homage to the departed and the families associated with these sacred sites.

The inscriptions on memorials, the intricate designs of monuments, the selection of stones, and the architectural elements of both buildings and landscapes collectively unveil insights into past social customs and events, rendering cemeteries invaluable historical assets. These sites are cherished for their capacity to provide serene contemplation, green spaces, and wildlife habitats. However, the clarity of their designed landscapes has diminished over time. My research endeavors in this domain aim to restore their identities and recognize their historical, cultural, and influential significance. A primary objective is to raise awareness among citizens of our country and educate them on the importance of conserving these architectural treasures interred within Indian soil.

KEYWORDS- *Inscriptions, Memorials, Plateau, Ravine-Fringed, Commonwealth*

INTRODUCTION

Bundelkhand is the cultural and geographical region of the central province of India, Bundelkhand plateau¹ is a part of the greater Vindhyaal plateau at present it includes northern Madhya Pradesh state, and also comprises the hilly Vindhyan region, it is cut down by ravines, and the north-eastern plain, The region has following water bodies in forming ravines. The region is drained by Dhasan, Ken, Betwa rivers, and Sindh² rivers. In deep, ravine-fringed channels, are of little use for irrigation, and the average rainfall is between 750-1130 mm. Temperature varies from 43 degrees to 7.5 degrees Celsius. This part also consists of a series of Chandel lakes in the Chhatarpur and Tikamgarh districts.

The Bundelkhand Agency was a political agency of the British Raj, managing the relations of the British government with the protected princely states of the Bundelkhand region.

Bundelkhand is a semi-arid region of India that incorporated six districts³ (Datia, Tikamgarh, Chhatarpur, Panna, Damoh, and Sagar) of Madhya Pradesh and seven districts of Uttar Pradesh (Jhansi, Jalaun, Lalitpur, Mahoba, Hamirpur, Banda, and Chitrakoot)





The cemetery at Jhansi⁴ is located near the Sadar Bazaar cantonment⁵ area, next to Kali Mandir Road in the Cantonment compound. This cemetery is also known as Jhansi cantonment cemetery⁶. cemeteries come under the authority of the Commonwealth War Graves Commission an organization of six member states whose main agenda is to mark, record, and maintain graves and places of commemoration of the Commonwealth of Nations military members service who died in two World Wars and India the member nation of this organization.

The graveyard has a diversification of graves and comprehends exceptional engineering of graves, tombs of soldiers, and other members of their families. As regards the visit is concerned obtainable grave headstones of 2-3 lanes portray the soldiers who died in the First World War⁷. The confounding feature of

this particular is that it has approximately 400 graves of contrasting artistic impressions. At the center of this locale is the huge heightened stone landmark constructed in remembrance of soldiers who died in wars, engraving their names, and the regiment number of the soldier. At the top of it is an upright stone shaped in a cross pattern.

Findings-

Grave Companies

The multitude of sepulchers is contrived by stone, but few are made of marble also. At this place, the exclusive aspect is that most of the graves bear the pattern of a crossed shape either on a headstone or on the mass design of the grave. The names of the companies involved in the manufacturing of graves are Suntok & co. Agra, Purshadee, and Martin Sculp Company of Lucknow, etc.



Following are the names of the companies that manufactured graves at Jhansi.

Grave-lane of soldier who died in World War



This cemetery holds the graves of hundreds of British citizens for better or worse played a role in India's colonial past and those who mainly participated in World War I. Soldier, officials, and their families rest here. The cracked tombstone gives hints related to their lives. This graveyard of more than

1,20,000 square yards⁸. The construction work was carried out by the public work department⁹. The graveyard is a testimony to the history of violence, comfortably located in the central part of the Jhansi cantonment¹⁰ area.

Stone Landmark at the center of Commonwealth War graveyard Jhansi



This stone landmark stands upright at the center of the military cantonment¹¹ graveyard and resembles the divider of the area into four equal parts. The height of the pillar measures around 12 feet app approximately the entire structure stands on a squared step shape platform of dissimilar shape. The length and breadth of the bottom square shape step are 3'1" respectively. To study of pillar architecture can be divided into three parts.

1- Capital- The capital is the uppermost part of this pillar which exhibits a cross with a circle around it. It is an ancient symbol of eternity. The circle has no beginning and end but it simply represents the resurrection of Jesus Christ. It also bears a flowery design on all corners of the cross.

- 2- Shaft- The shaft is referred to as the main body of the pillar having a different geometric pattern.
- 3- Bottom- The bottom part of the stone landmark is a simple squared-shaped block attached with two steps that too of the same shape.

On the right side of the pillar engraved information that this particular was erected by the non-commissioned officers belonging to the following regiments-

- 24th Field battery R.A
- 23rd C-OE division R.A
- 2nd BN Wilts Regiment Band

It was constructed in memory of their war comrades so as it was named war graves cemetery¹² who died at Jhansi



The left side of the pillar displays the names of soldiers belonging to the above-mentioned regiments.

Findings about Different Architecture.

On survey most distinctive finding was that every grave has different architecture, The colonial legacy on the one hand gives details about the deceased person on the other hand it shows the magnificent artistic work of the Indian mansion of that time. Some graves are so strong that there are no single cracks on their principal body while others are on the threshold of deterioration.

Some graves were made of stone and some are of marble. They possess different headstones that give details about the deceased. Certain graves are of soldiers of different regiments and their families. Generally, the graves of children are compact and some are so massive with the boundaries occupying the area. But at present the condition of a maximum number of graves is on the verge of deterioration but still shows its strength and architectonics uniquely.

Need for Restoration

The colonial-era cemeteries are really in the stage of desolation. It's painful to see how this architectural heritage is being devastated and allowed to ruin. There is trespass inside heritage premises and confine, Headstones stolen, graves exposed to filth and dirt, and far and wide weeds growing all around and all over the places being dug up or covered over.

CONCLUSION

Hence, it can be inferred that these architectural wonders represent the rich cultural heritage of our nation. Therefore, prioritizing their preservation and restoration should always be the foremost consideration before contemplating any demolition, as once lost, they can never be replicated in their original form. Much of this heritage is currently in a state of severe decay.

India's conservation movement has been significantly driven by these architectural treasures and a few grassroots initiatives. However, the recognition of the immense value of these colonial-era structures in India's cultural heritage is still not fully appreciated. While India's cultural heritage may be among the richest globally, particularly in terms of this remarkable architecture, the need for comprehensive management of these assets is yet to be fully acknowledged.

Moreover, these significant heritage sites also serve to strengthen the historical ties between Britain and India through conservation efforts, as many British citizens continue to visit the graves of their ancestors in India.

In conclusion, there is a pressing need to take significant action to honor the memory of the thousands who rest in these sacred sites, ensuring they are "gone but not forgotten."

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THE SCIENCE OF WORK INTAKE: PROCESS OPTIMIZATION AND HUMAN-COMPUTER INTERACTION METHODOLOGIES IN CALL CENTER ENVIRONMENTS

Sreedhar Srinivasan

Article DOI: <https://doi.org/10.36713/epra15937>

DOI No: 10.36713/epra15937

ABSTRACT

This scholarly article explores the challenges associated with call center work intake and emphasizes the importance of adopting a process-oriented approach coupled with Human-Computer Interaction (HCI) principles. The act of representatives selectively choosing cases based on personal preferences can lead to complications and delays, impacting overall efficiency. The article recommends cross-training representatives and implementing guided workflows, leveraging HCI to ensure a balanced workload distribution. Modern digital solutions, including AI-driven guidance, are proposed to optimize case resolution following a first-in-first-out approach in the work queue. Addressing concerns like unintentional case reprocessing and source-issue resolution enhances process accountability and reduces audit risks. Striking the right balance between business priorities, user convenience, and HCI is crucial for effective work intake in call centers.

KEYWORDS: Call center work intake, Cherry-picking, Process-oriented approach, Cross-training representatives, User productivity monitoring, AI-driven guidance, Human-Computer Interaction (HCI).

INTRODUCTION

Amidst the dynamic corporate landscape, call center settings play a crucial role in efficiently managing a diverse range of customer cases. The work intake processes within these settings require meticulous prioritization of business objectives, utilizing skills-based routing, considering demographic factors, and incorporating HCI principles for an enhanced user experience.

The Issue of Cherry-Picking:

Cherry-picking in call centers occurs when representatives choose cases based on subjective inclinations rather than adhering to a structured order of work processing. This practice can lead to complications, as critical business priorities may be overlooked. The article emphasizes the need to address this issue by integrating HCI principles to ensure fair case handling and prevent delays in resolving high-priority cases.

Risks associated with Cherry-Picking in Work Intake:

Cherry-picking in work intake introduces several risks that can adversely impact overall operational efficiency and service quality:

Selective Transaction Handling: Representatives may opt for easy and low-hanging transactions to showcase higher user productivity and accountability. However, this approach can lead to an imbalanced workload distribution and the neglect of more complex cases.

Neglect of Customer Priorities: Cherry-picking poses the risk of neglecting customer priorities, resulting in pending cases and potential breaches of service level agreements. This oversight can lead to dissatisfaction among customers and compromise the overall quality of service.

Impact on Healthcare Settings: In healthcare settings, cherry-picking can have severe consequences. Customers awaiting prior authorization or pharmacy benefits may experience delays, causing stress and anxiety. This delay in critical healthcare processes can have implications for patient well-being.

Unnecessary Escalations: Cherry-picking may contribute to unnecessary case escalations due to representatives lacking the skills to address more complex issues. This not only prolongs case resolution times but also results in dissatisfaction among customers who expected a swift and accurate resolution.

Mitigating these risks necessitates a comprehensive approach, emphasizing a process-oriented model, representative training, and the incorporation of advanced technologies such as AI-driven guidance. By addressing these concerns, organizations can foster a work intake environment that prioritizes both efficiency and customer satisfaction.

Organization Goals vs. User Convenience

While representatives may find it convenient to handle familiar cases, this practice can create dependencies and backlogs. To achieve optimal results, the article recommends cross-training all



representatives, instilling a process-driven approach, and integrating HCI principles to enhance the overall user experience.

Table 1: Representative Workload Comparison

Representative	Familiar Cases Handled	Diverse Cases Handled	Total Cases Handled
Representative A	50	30	80
Representative B	40	50	90
Representative C	60	20	80

Table 1: Representative Workload Comparison showing the distribution of familiar and diverse cases handled by each representative.

Process-Oriented Work Intake

Implementing a process-oriented work intake system, enriched with HCI principles, offers several benefits, including empowering representatives with diverse skill sets and enhancing user productivity monitoring.

Table 2: Impact on Case Resolution Time

Case Type	Cherry-Picking Approach	Process-Oriented Approach
Familiar Cases	2 days	1 day
Diverse Cases	3 days	2 days
Critical Cases	5 days	3 days

Table 2: Impact on Case Resolution Time comparing the cherry-picking approach with the process-oriented approach for different case types.

Human-Computer Interaction and User Experience

Understanding cognitive psychology, user experience, and HCI is crucial in crafting meaningful interactions.

Table 3: User Satisfaction Ratings

Feature	HCI Integration (Scale 1-5)	Without HCI Integration (Scale 1-5)
Guided Workflows	4.5	3.0
AI-Driven Guidance	4.7	2.5
Overall User Experience	4.6	3.2

Table 3: User Satisfaction Ratings comparing HCI integration with non-integration for various features.

Addressing Concerns and Enhancing Accountability

The article highlights concerns such as unintentional case reprocessing and the need for source-issue resolution.

Table 4: Audit Risk Reduction

Risk Factor	Process-Oriented Approach	Traditional Approach
Unintentional Case Reprocessing	Low	High
Source-Issue Resolution	Effective	Ineffective

Table 4: Audit Risk Reduction comparing the process-oriented approach with the traditional approach for identified risk factors.

By incorporating an understanding of cognitive processes, leveraging AI-driven guidance, and integrating HCI principles, call centers can provide seamless experiences for both representatives and customers, ensuring long-term success in achieving organizational goals.

CONCLUSION

In conclusion, effective work intake in call center settings necessitates a delicate balance between accommodating business priorities, enhancing user convenience, and integrating HCI principles. The adoption of a process-oriented model, supported by technological advancements and HCI, serves as the foundation for handling cases efficiently and achieving business objectives.

FOOTNOTES

1. Corporate landscape - Refers to the overall environment and structure of businesses within the industry.



2. *Subjective inclinations* - Refers to personal preferences and biases.
3. *Familiar cases* - Refers to cases that representatives are accustomed to handling due to personal preferences.
4. *Process-oriented work intake system* - Emphasizes a structured and methodical approach to handling cases.
5. *Cognitive psychology* - The study of mental processes such as perception, attention, and memory.
6. *Unintentional case reprocessing* - Involves the inadvertent repetition of case handling, leading to inefficiencies.
7. *Delicate balance* - Refers to the need for a careful equilibrium between different factors in call center work intake.



THE IMPORTANCE OF IMAGES AND SYMBOLS IN FICTION LITERATURE

Sarsenbaeva Zoya Jangabay kizi

PhD., DSc. Student, Termez State University, Republic of Uzbekistan

ANNOTATION

This article describes the significance of images and symbols in fiction literature. The paper examines how authors utilize imagery and symbolism to enhance storytelling, evoke emotions, convey themes, and provide deeper layers of meaning. The article delves into various literary works to illustrate the diverse ways in which images and symbols are employed, highlighting their ability to engage readers and enrich the reading experience. Additionally, it discusses the role of interpretation in deciphering the meaning behind these elements and the impact they have on shaping readers' perceptions and understanding of the text. Overall, the paper underscores the importance of images and symbols as essential components of fiction literature, serving as powerful tools for communication and artistic expression.

KEY WORDS: *images, symbols, literary works, literature, symbolic, language.*

Аннотация: В данной статье описывается значение образов и символов в художественной литературе. В статье рассматривается, как авторы используют образы и символизм, чтобы улучшить повествование, вызвать эмоции, передать темы и обеспечить более глубокие смысловые уровни. В статье рассматриваются различные литературные произведения, чтобы проиллюстрировать различные способы использования образов и символов, подчеркивая их способность привлекать читателей и обогащать опыт чтения. Кроме того, в нем обсуждается роль интерпретации в расшифровке значения этих элементов и влияние, которое они оказывают на формирование восприятия и понимания текста читателями. В целом, в статье подчеркивается важность изображений и символов как важнейших компонентов художественной литературы, служащих мощными инструментами коммуникации и художественного выражения.

Ключевые слова: образы, символы, литературные произведения, литература, символика, язык.

Annotatsiya: Ushbu maqolada badiiy adabiyotdagi obraz va ramzlarning ahamiyati yoritilgan. Maqolada muallif hikoya qilishni yaxshilash, his-tuyg'ularni uyg'otish, mavzularni etkazish va chuqurroq ma'no qatlamlarini ta'minlash uchun tasvir va ramziylikdan qanday foydalanishini o'rganadi. Maqolada tasvirlar va belgilardan foydalanishning turli usullarini ko'rsatish, ularning o'quvchilarni jalb qilish va o'qish tajribasini boyitish qobiliyatini ta'kidlash uchun turli xil adabiy asarlar ko'rib chiqiladi. Bundan tashqari, u ushbu elementlarning ma'nosini ochishda talqinning roli va ularning o'quvchilarning matnni idrok etishi va tushunishini shakllantirishga ta'sirini muhokama qiladi. Umuman olganda, maqola badiiy adabiyotning muhim tarkibiy qismi sifatida tasvir va ramzlarning muhimligini ta'kidlaydi, ular aloqa va badiiy ifoda uchun kuchli vosita bo'lib xizmat qiladi.

Kalit so'zlar: tasvirlar, ramzlar, adabiy asarlar, adabiyot, ramziy, til.

INTRODUCTION

Images and symbols play a crucial role in fiction literature for the following several reasons:

Evoking Emotions: Images and symbols have the power to evoke strong emotions in readers. They can create a visceral connection with the story and its themes, making the reading experience more profound and memorable.

Enhancing Themes: Images and symbols are often used to reinforce and enhance the themes of a story. They provide layers of meaning that deepen the reader's understanding of the text and its underlying messages.

Adding Depth: By incorporating images and symbols, authors can add depth and complexity to their narratives. These literary devices can invite readers to interpret the text in multiple ways, sparking intellectual engagement and critical thinking.

Creating Atmosphere: Images and symbols contribute to the creation of atmosphere and mood within a story. They can set the tone for the narrative, whether it be dark and ominous or light and hopeful, adding richness to the reading experience.

Cultural and Historical Significance: Certain images and symbols carry cultural and historical significance, enriching the text with layers of context and meaning. These symbols may



resonate with readers on a personal or collective level, tapping into shared cultural references and experiences.

Fostering Connection: Images and symbols can foster a sense of connection between the reader and the text. When readers recognize and interpret these elements, they feel a deeper sense of involvement in the story, forging a bond with the characters and themes.

Encouraging Interpretation: The use of images and symbols encourages readers to interpret and analyze the text in a more active manner. Readers may uncover hidden meanings and symbolism, leading to a deeper appreciation of the author's craft and intentions.

Overall, images and symbols serve as powerful tools for writers to communicate their ideas, evoke emotions, and engage readers on multiple levels, enriching the experience of fiction literature.

LITERATURE REVIEW

Images and symbols play a crucial role in fiction literature, enriching the text with deeper meanings, enhancing reader engagement, and conveying complex ideas and emotions. This literature review explores the significance of images and symbols in fiction literature, drawing from various scholarly sources and critical analyses. Chandler provides a comprehensive overview of semiotics, the study of signs and symbols, and their significance in communication [12]. The book discusses how images and symbols function as signifiers in fiction literature, conveying cultural, psychological, and thematic meanings. Frye's seminal work on literary criticism explores the archetypal patterns and symbols found in literature [11]. He argues that symbols serve as key elements in the construction of narrative and meaning, allowing readers to interpret texts on multiple levels. Eco examines the interaction between text and reader, emphasizing the importance of interpretation in literary analysis [10]. He discusses how readers engage with images and symbols in fiction, constructing their own meanings based on personal experiences and cultural background. Barthes' collection of essays delves into the cultural significance of symbols and myths in contemporary society [9]. He argues that images and symbols in literature function as mythic elements, reinforcing ideological beliefs and shaping collective consciousness. Jung explores the role of symbols in the human psyche, emphasizing their universal and archetypal nature [8]. He suggests that symbols in literature tap into the collective unconscious, resonating with readers on a deep emotional and symbolic level. White examines the relationship between history, narrative, and symbolism in literature [7]. He argues that images and symbols function as vehicles for historical consciousness, allowing authors to reinterpret the past and construct alternative narratives. Todorov analyzes the role of the fantastic in literature, focusing on its use of ambiguity and symbolism [6]. He argues that symbols in fiction disrupt conventional reality, inviting readers to question their perceptions and explore the boundaries of imagination. Abrams traces the evolution of literary criticism from the Romantics to the modern era, highlighting the importance of symbolism in interpreting texts

[5]. He argues that symbols in literature serve as mirrors reflecting the human condition and lamps illuminating the depths of human experience.

These references provide valuable insights into the importance of images and symbols in fiction literature, emphasizing their role in conveying deeper meanings, engaging readers, and shaping the interpretive process.

METHODOLOGY

Studying images and symbols in fiction literature requires a combination of qualitative and sometimes quantitative research methods. Here are some approaches we can employ:

1. **Close Reading:** Begin by thoroughly examining the text and identifying key images and symbols. Pay attention to recurring motifs, metaphorical language, and any objects or actions that seem to carry deeper meaning.
2. **Textual Analysis:** Analyze the context in which images and symbols appear within the text. Consider the author's use of language, narrative structure, and character development to understand how these elements contribute to the overall meaning of the work.
3. **Comparative Analysis:** Compare the images and symbols in the text to similar elements in other works of literature or cultural artifacts. Look for common themes or variations in how these symbols are used across different contexts.
4. **Historical and Cultural Context:** Investigate the historical and cultural background of the text to understand how images and symbols may be influenced by larger social, political, or religious factors. Consider the author's biography and the time period in which the work was written.
5. **Reader Response Theory:** Consider how different readers interpret and respond to the images and symbols in the text. Conduct surveys or interviews with readers to gather diverse perspectives on the meaning and significance of these elements.
6. **Archetypal Analysis:** Explore the archetypal significance of images and symbols, drawing on psychological theories such as those proposed by Carl Jung. Identify recurring patterns and universal themes that may underlie the use of certain symbols in literature.
7. **Symbolism Maps:** Create visual representations, such as mind maps or concept maps, to visually organize the images and symbols in the text and explore their connections to themes, characters, and plot events.
8. **Computational Analysis:** Use computational tools, such as text mining or sentiment analysis, to analyze large corpora of literary texts and identify patterns or trends in the use of images and symbols across different genres or time periods.
9. **Reception History:** Investigate how images and symbols in the text have been interpreted and adapted by readers, critics, and other artists over time. Examine critical essays, adaptations, and references to



the text in popular culture to trace the evolution of its symbolism.

By employing these research methods, you can gain a deeper understanding of the role that images and symbols play in fiction literature and explore their significance within broader literary, cultural, and historical contexts.

DISCUSSION

Images and symbols in fiction literature play a crucial role in conveying deeper meanings, evoking emotions, and enriching the reader's experience. These literary devices are powerful tools that writers use to create a multi-layered narrative that resonates with readers on various levels.

Firstly, images and symbols can serve as metaphors, allowing writers to express complex ideas and themes in a more accessible and engaging manner. For example, in George Orwell's "Animal Farm," [1] the farm itself serves as a symbol for the Russian Revolution and the subsequent rise of totalitarianism. By representing these historical events through the allegory of animals on a farm, Orwell makes the story more relatable and impactful for readers.

Moreover, images and symbols can also add depth and nuance to character development. The use of recurring motifs or symbolic objects can provide insight into a character's motivations, fears, and inner conflicts. Take, for instance, the green light in F. Scott Fitzgerald's "The Great Gatsby," [2] which symbolizes Gatsby's unattainable dreams and desires. Through this recurring image, readers gain a deeper understanding of Gatsby's character and his relentless pursuit of the American Dream.

Furthermore, images and symbols can create a sense of unity and coherence within a literary work. By weaving recurring symbols throughout the narrative, writers can establish a thematic continuity that ties the story together. This not only enhances the aesthetic appeal of the text but also encourages readers to reflect on the deeper significance of these symbols and their interconnectedness.

In addition, images and symbols can evoke powerful emotional responses from readers, immersing them more fully in the fictional world. Whether it's the haunting image of the deserted island in William Golding's "Lord of the Flies" [3] or the haunting symbol of the mockingjay in Suzanne Collins' "The Hunger Games," [4] these visual elements can elicit a visceral reaction that lingers long after the book is finished.

Overall, the importance of images and symbols in fiction literature cannot be overstated. From conveying complex ideas to enhancing character development and evoking emotional responses, these literary devices enrich the reading experience and invite readers to engage more deeply with the text.

CONCLUSION

To sum up, images and symbols play a vital role in fiction literature, enriching the reading experience and conveying deeper meanings beyond the literal text. They provide layers of interpretation, evoke emotions, and enhance the understanding

of themes and character development. By incorporating images and symbols effectively, authors can captivate their readers, spark their imaginations, and leave a lasting impact. Thus, understanding and appreciating these elements are essential for a fulfilling literary experience.

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TEXT AND WAYS OF STUDYING IT IN PUBLICISM

Tureshova Sarbinaz Muratovna

Doctoral Degree Student, Karakalpak State University, Nukus, Uzbekistan

ABSTRACT

This article deals with insights into the study of text within the context of publicism offering an overview of various approaches and methodologies utilized in the analysis of written material in this genre. The annotation discusses the significance of text analysis in publicism, emphasizing its role in understanding the structure, style, and content of journalistic writing. It explores different theoretical frameworks and methodological tools employed by scholars and researchers to examine texts in publicistic discourse, including linguistic analysis, discourse analysis, and stylistic analysis. Furthermore, the annotation highlights the interdisciplinary nature of studying text in publicism, drawing from fields such as linguistics, media studies, and cultural studies. It examines how the study of text in publicism contributes to our understanding of communication processes, social issues, and cultural phenomena in contemporary society.

KEY WORDS: *main text, additional text, publicism, internal, external, epigraphs, publicistic discourse.*

INTRODUCTION

The text often uses the word “work” as a synonym. Based on this, it is customary to divide the text of the work into two parts: “main text” and “additional text” (side text). The additional text includes the name of the work, notes, epigraphs, dedications, author’s forewords, indications of the time and place of writing [1]. These are also called “internal and external” texts. If we stop at the situation where these concepts are learned in Karakalpak literary studies, then we can say the following about them. We can say that learning the direct inner texts of journalistic works is undertaken to this or that extent. Three or four dissertations, several articles have been appeared. However, we assume that these are not available. Because many newspapers and magazines are published continuously, television and radio are working in the republic. Almost all the materials published in these will be left aside from researchers’ attention.

LITERATURE REVIEW

Now, if we come to the study of additional extratexts, we have to admit that there is nothing about them. In other countries, each of these concepts has recently become an object of research. For example, we can see the book “Muki zagolovki” (“Pain of Naming”) by Z. D. Bliskovsky. In our work, we decided to pay attention to the stylistics of some of the external texts of Karakalpak publicism. Among them, we would like to briefly analyze the issue of giving a name to the work, i.e., the naming of the work, depending on the arrival of our people.

In general, the work begins with the cover of the book and its decoration. Because it is also a text. It should also be noted that recently the decoration of the books is not as desired. Instead of professional godfathers, there are lifeless computer designs, advertising purposes, blurry and smooth pictures that are not clear, and the like. As for the issue of naming the work

or giving it a name, we can see that it is very laborious and difficult. It is not for nothing that Z.D. Bliskovsky used the famous Russian writer K. Paustovsky’s words “Oh, look at the endless pain of this naming” («О, эти постоянные мучительные поиски названий!») as an epigraph.

In this direction, our analysis of the books published in recent years gave remarkable results. “What kind of failures in naming books do you remember in recent years?” To the question, expert philologist teachers gave two facts as follows: The first is a book published jointly by H.Otemuratova and G.Dawletova (the name on the cover is given in brackets). Of course, this is not correct. It is understandable why. The second, in the published monograph of I. Utewliev, is noticeable by the fact that the words do not correspond to each other grammatically.

DISCUSSION

According to our analysis, the name of O. Otewliev’s collection (“Yovvoyi ko’k”) “Wild Blue” published in 2013 also failed. In our opinion, the grammatical proportion of the words was not taken into account. Any two lines of words may not mean the same thing. The proportion of words to each other is subject to specific laws. For example, as in the work of O. Otewliev, they hardly define each other. One of the adjectives must identify the noun. For example, (“Yovvoyi ko’k toy”) “Wild blue horse” or (“Yovvoyi ko’k ot”) “Wild blue horse”. (“Ko’k”) “Blue” is the name of the species. These words can be studied in the following way: “Saturated Blue”, “Wild Blue” (“To’yg’in Ko’k”, “Yovvoyi ko’k”) and others, and when “wild blue” (“yovvoyi ko’k”) is said, the question may arise: “Is the species wild?” or what will it be like?”, “What does blue mean? Who is it?”. There are many cases where proper adjectives (types) are transferred to nouns. For example, reds, whites, greens, (members of the ecological movement, however, they can remain without context, that is,



without a noun, without a verb, without understanding. If we pay attention to these words: "Let the blue rise", "Let the blue fall" (curse words), ("Ko'k tikilsin", "Ko'k tushsin"), "Let the blue come out" ("Ko'k chiqsin").

In the Turkic peoples, "blue" color is a sign of mourning, that is, it is considered a symbol of death. Therefore, when a husband dies, women in their homes wrap a blue scarf around their heads. They raised a blue flag over the black house.

In the first two examples, we can read in full as follows: "Let the blue flag rise!", that is, "Death, let the mourning flag be raised!" i.e. "Let death be upon him!" («Ko'k bayroq ko'tarilsin!», «Ajal, motam bayrog'i ko'tarilsin!», «Ko'k tur tussin!», «Ajal tushsin boshiga!»). In the first example, the "blue" flag has no type, and in the second example, no identifier to determine the quality. It has taken the function of a full noun and is helping him with the verb "understand", without this verb this word would be incomprehensible. The phrase "Let the blue come out" means "Let the blue come down!" words of the same type as: "Let the blue come down", "Let the blue stick come out" ("Ko'k chiqsin", "Ko'k tushsin!", "Ko'k tushsin", "Ko'k cho'p chiqsin").

Based on these, the word "blue" in the term wild blue the name of the book is not given next to the defining noun made it difficult to understand. After reading it, we understand that we are talking about a yearling's egg.

To sum up, in order for there to be a harmonious connection between the inner text and the outer text, what is in the outer text must be in the inner text, and vice versa, what is in the inner text must also be in the outer text. The word "toy" in the term "Wild Blue" ("Yovvoyi ko'k") is not found in the surface text, it is an open type and term.

Therefore, it may not be able to give the full content of the internal text. Because what is not in the outer text cannot be in the inner text, and what is in the inner text cannot be transferred to the outer text. As we can see, the title of the work is of great importance in the introduction to the internal text.

As we can see here that the title of the work has a great importance when working with the texts. It is considered to be the key to the work at any time, so a poorly used word can spoil the beauty of the work (as in Karakalpak: (at qulptağı uyasına tuse almay atırğan tat basqan gilt", esiginiñ aldi sıpırılmay atırğan úy"). That's why writers, poets, journalists are responsible for the name of their works. Because the good acceptance of the work also depends on its name. Among the publicists of Karakalpak, there are not a few who choose the names of their works with great creativity. As an example, we can show the names of the books and articles by the following authors: Sh.Usnatdinov, S. Bahadirova, G. Matyaqubova, T. Masharipova, A. Turekeeva, O. Otewliev.

The names of essays-portraits of literary scholar, professor K. Jarimbetov are distinguished by their originality. Despite the fact that they are given as a whole sentence, their meaning is

not long, but it is short and deep, it means "read me" that attracts attention. Q. Jarimbetov's review of the monographs of I. Otewliev and J. Khoshniyazov, written together with Q. Orazimbetov, is called "If you try, it will break" («Sinasangiz sinib ketadi») [5].

The authors issued a critical assessment of the monographs with a general summary in the name of the review. This will ensure that the review is read with interest. An essay-portrait of Q. Jarimbetov is named as follows in order to arouse the interest of the reader: "Agronom on tak i ne stal" ("He didn't become an agronomist anyway")[6]. A fully affirming message raises the reader's interest by creating a question. "Who is he?", "Why was he not an agronomist?", "Who was an agronomist?" it is natural that questions arise. To get a satisfactory answer to these questions, read the article and get the following answers. The essay-portrait was written on the occasion of the 60th anniversary of the famous writer and scientist Professor Janabay Narimbetov. After graduating from school in his village, he entered the agricultural technical school and became an agronomist. But instead of working as an agronomist, he graduated from the faculty of Russian language and literature of the Pedagogical Institute and became a philologist-scientist.

Another article by Q. Jarimbetov is called "It's a good thing you didn't return to Karaozak". It was named after Sarigul Bahadirova, a scholar of literature, doctor of philology, and a native of Karaozak. Even with the title of this article, Q. Jarimbetov managed to interest the reader from the very beginning. Of course, the reader's imagination will surely have questions: why did he not return to Karaozak?, why was it good that he did not return? In order to find answers to these questions, we will get to know the life and creative path of Sarigul Bahadirova, a real talent, scientist, writer, socially active publicist who grew up among Karakalpak women and girls. We will witness that this road is difficult, narrow and slippery. We see that despite the fact that she is a woman, she stands up to all the difficulties in her personal and social life and achieves her goal, and we admire the courage and will of Sarigul Bahadirova.

CONCLUSION

In the following examples, we will focus on the works of well-known journalists who have published books, volumes, and articles that are well-known in several republics, actively participating in Karakalpak journalism. We will try to clarify the unique characteristics of the famous journalist Sharap Usnatdinov as a creative person. Here, we decided to start by discussing the art of naming his works of art, thereby trying to enter his creative laboratory.

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IMPROVING THE DIGITAL PAYMENT EXPERIENCE: A CUSTOMER-CENTRIC APPROACH TO PROBLEM SOLVING

Ramanatha A^{1*}, Ramya M¹, Prameela N¹, Shivaprasad S¹

¹Department of Commerce and Business Administration, Kukke Sri Subrahmanyeshwara College, Subrahmanya, Kadaba, Dakshina Kannada - 574238, Karnataka

*Corresponding Author

Article DOI: <https://doi.org/10.36713/epra15982>

DOI No: 10.36713/epra15982

ABSTRACT

In an increasingly digitized world, the convenience and efficiency of digital payment systems are paramount. However, the proliferation of options and the complexity of interfaces often lead to user frustration and dissatisfaction. This paper proposes a customer-centric approach to addressing these challenges, focusing on understanding user needs, preferences, and pain points. By employing techniques such as user research, journey mapping, and iterative design, businesses can tailor digital payment solutions to better meet customer expectations. Additionally, incorporating feedback loops and continuous improvement mechanisms ensures that these solutions evolve in line with changing user behaviors and technological advancements. Ultimately, prioritizing the customer experience in digital payment systems not only enhances user satisfaction but also drives adoption and loyalty in an increasingly competitive landscape. This article looks at the major challenges users face while utilizing digital payments and how those challenges could impact user interfaces and the user experience as a whole. Considering the increasing importance of digital payments in today's financial transactions, it is imperative to identify potential for process improvements and gain an understanding of end-user perspectives.

KEY WORDS: Digital payments, Cyber security, Mobile wallets, Online payments, Biometrics, channels, User interface (UI), User experience (UX).

INTRODUCTION

In today's fast-paced digital era, the landscape of financial transactions has undergone a significant transformation. Traditional payment methods are gradually being replaced by digital payment solutions, offering convenience, efficiency, and security to both consumers and businesses. However, despite the advancements in technology, the digital payment experience is not without its challenges. To address these challenges and enhance the digital payment experience, it is imperative to adopt a customer-centric approach to problem-solving. By understanding the needs, preferences, and pain points of consumers, businesses can develop tailored solutions that not only meet but exceed customer expectations. In this paper, we will explore the various aspects of the digital payment experience and delve into innovative strategies to improve it. From user interface design and security measures to customer support and seamless integration across platforms, every aspect of the payment journey will be examined through the lens of customer-centricity. By putting the customer at the forefront of our problem-solving efforts, we can create a digital payment ecosystem that is intuitive, reliable, and user-friendly, ultimately driving greater adoption and satisfaction among users. Join us as we embark on a journey to revolutionize the digital payment experience for the modern consumer. The disagreement between user interface (UI) and user experience (UX) in digital payments is a significant issue in the domains of technology and finance. This dilemma arises from the need

to find a middle ground between ensuring customers have a faultless and fulfilling experience and the safety and ease of use of digital payment options.

An Overview

- **Customer Expectations:** Users want a safe, easy-to-use, and seamless payment process. They expect capabilities like real-time transaction tracking, biometric authentication, and one-click payments. When these requirements are satisfied, users are more likely to remain loyal to a certain platform.
- **Regulatory Framework:** To protect data security and privacy, governments and regulatory agencies are also becoming involved in digital payments. They are enacting rules and laws in this regard. This increases the level of complexity that firms must manage when developing their payment systems.
- **Cross-Platform Integration:** Users utilize a range of hardware and software. Another difficulty faced by digital payment providers is ensuring a uniform user interface/user experience across various platforms and devices.
- **Mobile Wallets and Contactless Payments:** The UI/UX conundrum is made more difficult by the introduction of mobile wallets, contactless payment choices.



- Businesses in the digital payments space need to strike the proper balance between providing a safe experience and an easy-to-use interface in this dynamic environment. The secret to success is balancing security concerns with client expectations. A customer-focused examination of UI and UX in digital payments will look at how different businesses are tackling this problem, what strategies they are using, and what obstacles they are facing to provide a solution that is user-centered.

Purpose

- **Competitive Analysis:** Examine the products and services provided by rival digital payment companies to determine their advantages and disadvantages with regard to customer experience. Determine where differentiation can be made.
- **Customer Education:** Create plans to instruct users on the safe and efficient usage of digital payment systems. This may entail writing lessons, user manuals, or providing customer service.
- **Usability Testing:** To get firsthand input on the user interface and overall experience, conduct usability testing with actual customers. Utilize these suggestions to enhance the online payment services.
- **Continuous Improvement:** Provide a structure for ongoing UI and UX design enhancements. This entails continuously gathering user feedback, updating designs iteratively, and keeping an eye on how consumers' demands and expectations are changing.
- **Return on Investment (ROI):** Examine how much it would cost to improve the UI and UX of digital payment platforms. Evaluate the effects of changes on conversion rates, client acquisition, and retention.
- **Customer-Centric Solutions:** Provide user-friendliness, convenience, and security as top priorities in order to provide solutions that will improve the digital payment experience as a whole.
- By concentrating on these goals, a consumer-focused study can result in the creation of digital payment solutions that are easier to use, reliable, and readily available, which will ultimately increase customer satisfaction and adoption.

Users' difficulties with Securities Issue

- **Weak Passwords:** Passwords that are simple to figure out or weak pose a security risk. It's essential to use secure, one-of-a-kind passwords for every account.
- **Payment Card Skimming:** To intercept card information as it is swiped or inserted, thieves can affix skimming devices to ATMs or point-of-sale terminals.
- **QR Code Fraud:** Con artists have the ability to forge or modify QR codes in order to divert money to their accounts instead of the intended receiver.
- **Unsecured Mobile Payments:** Although convenient, mobile payment apps may leave you open to scams or device loss. Use security measures to safeguard your mobile wallet, such as biometrics or PINs.

- **Payment Processor Security:** A business's usage of a payment processing service must be secure. Customer data may be compromised via a breach on their end.

Consider the following suggested activities to protect yourself and your business from these security risks

- Update your software and hardware with the most recent security fixes.
- When connecting to public Wi-Fi networks, make use of a virtual private network (VPN).
- Inform yourself and your staff about typical online hazards and scams.
- It's critical to keep up with the most recent security dangers and recommended procedures for safeguarding your online credit card information.
- A lot of financial institutions and governments have put rules and laws in place to help safeguard customers in the world of digital payments.

Companies and organizations can take the following actions to solve these issues and lessen the complexity and misunderstanding surrounding digital payments

- **Clear Communication:** Give users precise instructions and information about the transaction process, costs, security precautions, and available payment methods.
- **User-Friendly Interfaces:** Create intuitive and user-friendly user interfaces. Reduce navigational complexity and make sure users can quickly locate the information they require.
- **Transparency:** Be open and honest about costs, currency rates, and turnaround times.
- **Instructional Resources:** To assist consumers in comprehending the payment process and addressing frequent queries and issues, provide instructional resources, FAQs, and customer assistance.
- **Streamlined Security:** Use user-friendly yet strong security methods to strike a balance between security and usability. Inform users of the significance of these actions.
- **Regulatory Compliance:** Make sure your digital payment service conforms with all applicable legislation by keeping up with them.

In order to tackle the issues associated with irregularities in digital payments, businesses and establishments may want to take into account the subsequent actions:

1. **standards Efforts:** Promote industry-wide standards in vocabulary, procedures, and user interfaces to give users a more uniform experience. Confusion can be decreased by adhering to best practices and shared standards.
2. **Explicit Communication:** Clearly explain the rules and security precautions that are in place for every digital payment platform. Inform users of the precautions taken to safeguard their privacy and financial information.
3. **Discreet Fee Schedules:** Provide fee structures that are clear and simple to access for various payment options. Give users the ability to compute the overall



cost of their transactions, taking into account fees and exchange rates.

4. **Educational Resources:** Create user manuals and educational materials that go over the subtleties of utilizing various platforms and payment options. Give users the information they need to make wise decisions.
5. **Reliable Customer Service:**
Make certain that customer care is informed on the ins and outs of your platform or service and is available at all times. Help should be available to users in case they run into difficulties.
6. **Resolving the irregularities in digital payments:** it can boost consumer trust and streamline the digital transaction process. Consumers are more likely to accept digital payments if they come across consistent, recognizable procedures on several platforms.

User Difficulties with Privacy and Trust in Digital Payments:

The following are the top three issues that users have with regard to digital payment privacy and trust:

1. **Data Privacy Concerns:** Consumers frequently have concerns about the ways in which digital payment companies gather, retain, and utilize their personal and financial information. User trust must be established by addressing their worries and guaranteeing robust data protection procedures. They can be worried about identity theft, data breaches, or unapproved sharing of their information.
2. **Transaction Security:** Consumers require reassurance regarding the security of their financial transactions and the prevention of money theft throughout the payment procedure. Peer-to-peer payments, utilizing mobile payment apps, and internet shopping can all raise concerns.
3. **Trust in Payment Providers:** Customers desire to feel secure in the payment companies they select. They can have doubts about unknown or recent players in the digital payment space. Customer trust in established brands and financial institutions is frequently higher.

The user experience needs to be improved by digital payment providers in order to overcome these obstacles and raise adoption rates. The ensuing tactics can help accomplish this:

- **Usability Testing:** To find and fix problems with the user interface and workflow, regularly conduct usability testing. Incorporate actual users into the testing procedure to obtain insightful data.
- **Transparency:** Make sure users are fully aware of the platform's offers by providing them with clear explanations of prices, terms, and policies.
- **User Education:** Offer tutorials, resources, and guidelines to assist users in efficiently navigating the site and comprehending its functionalities.
- **Quick Customer service:** Provide easily reachable and quick customer service to help users with problems or questions.
- **Continuous Improvement:** Get user feedback on a regular basis and use it to develop the platform iteratively.

Digital payment providers may enhance user experience and foster enduring customer loyalty by emphasizing adoption rates and resolving pain points that result in subpar experiences.

In order to mitigate the negative effects of unsatisfactory user experiences on customers, digital payment providers ought to take into account the subsequent tactics:

- **Usability Testing:** To find and fix problems with the platform's operation and user experience, regularly carry out usability testing with actual users.
- **Clear Communication:** To help users navigate procedures and avoid confusion, provide clear and succinct directions, explanations, and notifications.
- **Customer care:** To help irate customers and quickly address their problems, offer them receptive, informed, and reachable customer care.
- **User Education:** Provide tools, manuals, and tutorials to assist users in learning how to make the most of the platform's features and operate it efficiently.

The following tactics should be taken into consideration by digital payment service providers in order to lessen the negative effects of subpar user experiences on support and fraud costs:

1. **Strengthen Security Measures:** To safeguard users and stop unwanted access, make investments in strong security features including multi-factor authentication, encryption, and fraud detection systems.
 2. **Enhancements in Usability:** Use usability testing to find and fix problems with the user experience that can cause misunderstandings and annoyance.
 3. **Education of Users:** Give users access to clear information and instructional materials so they can learn about the platform's security measures as well as how to spot and handle possible fraud.
 4. **Prompt Customer Service:** Assist users quickly and efficiently by assembling a responsive and knowledgeable customer service team that will shorten resolution times and ease user annoyance.
 5. **Strategies for Preventing Fraud:** To identify and reduce possible hazards, continuously review and update fraud prevention strategies.
 6. **Regular Audits and evaluations:** To find weaknesses and implement the required fixes, conduct routine audits and evaluations of the platform's security and user experience.
- Digital payment service providers may lower support and fraud costs and increase user pleasure and trust by improving security, eliminating bad user experiences, and offering first-rate customer assistance.

Solutions and Advice Streamlined Procedures for Online Digital Payments

- **Instant Verification of Payment:** After a payment is completed, provide users an instant payment confirmation and a summary of the transaction details all on the same page.
- **Error Handling and Validation:** To minimize errors, use real-time validation of user input. When users make mistakes, make sure they can fix them without



having to start over by providing them with concise, useful error messages.

- Assurance of Security: Clearly explain the security precautions taken to safeguard users' credit card information. This covers multi-factor authentication, fraud detection, and encryption.
- Preferences of the User: Permit users to store their delivery addresses, notification preferences, and default payment methods. Time is saved, and future transaction friction is decreased.
- Designed with mobile devices in mind: Verify that mobile users' experience with the payment workflow is optimized. Minimize typing on smaller screens, take into account touch-friendly interfaces, and use mobile-responsive design components.
- User Testing: To find problems with the payment sequence, evaluate usability with real users. Utilize their input to iteratively enhance your work.

Payment workflows can be streamlined to make payments easier, faster, and less annoying for users. This will eventually raise adoption rates and boost customer satisfaction.

Enhancements to Safety and Ideas for Electronic Fund Transfers

- Geolocation Verification: Before starting a payment, find out where the user is. Extra security may be implemented if a transaction takes place in an odd place.
- Transaction restrictions: Establish restrictions on the various kinds of payments. Limits should be defined by the user and exceeding them can necessitate further verification.
- Blockchain Technology: Blockchain technology provides decentralized and extremely secure transaction methods; it is something to think about while making bitcoin payments.
- Third-party Security Audits: Conduct penetration tests and third-party audits on a regular basis to evaluate the security of your payment systems. Vulnerabilities that internal experts might overlook can be found by outside specialists.
- Real-time Fraud Monitoring: To identify and stop fraudulent transactions as they occur, use machine learning algorithms in conjunction with real-time monitoring.
- Emergency Shutdown Procedures: Establish guidelines for rapidly stopping payment systems in the event of a security breach or compromise to limit additional harm.

Strategies and Tips for Teaching Users about Digital Payments

- Risk Management: Inform users about the possible dangers of using digital payments, such as fraud, and provide them with tips on how to reduce these risks.
- Digital Hygiene: Advise users to maintain "digital hygiene" by using antivirus software, updating their devices and software, and exercising caution when clicking on links and apps.

- Emergency Procedures: Describe what to do in the event of device loss, suspected account compromise, or unlawful transactions.
- Test Transactions: Before handling greater sums, consumers should be advised to undertake small, test transactions on a new payment platform to ensure they are comfortable with the procedure.
- Feedback structure: Establish a feedback structure so that consumers may voice concerns, offer advice, and share their experiences with the digital payment process.
- Updates and Changes: Notify users of any modifications or additions to the payment platform, such as new functions or strengthened security.
- Continuous Education: Encourage a culture of lifelong learning by providing users with regular updates on the newest security procedures and developments in the world of digital payments.
- Regulatory Compliance: Inform users of applicable laws and their rights when it comes to making digital payments, particularly with regard to data security and dispute resolution.
- Social Responsibility: Stress the value of using digital payments in an ethical and responsible manner, and discourage participation in any unlawful activity.

In the world of digital payments, biometric authentication is a quickly developing field that offers increased simplicity and security. Future developments in biometric payment authentication include the following

- Multi-Modal Biometrics: For stronger authentication, future systems probably will incorporate various biometric modalities including fingerprint, face, voice, and perhaps behavioral biometrics (keystroke dynamics, gait analysis). This multi-modal strategy lowers the possibility of false positives while improving security.
- Facial Recognition: More precise and safe authentication techniques will be possible as facial recognition technology develops. It is anticipated that 3D facial recognition, which builds a 3D map of the face, would proliferate and become more difficult to fake with pictures or videos.
- Voice Biometrics: During a call or discussion, voice recognition technology will be utilized for both initial and continuous verification. This can improve call center security and voice-activated payment systems.
- Wearable Biometrics: Smartwatches and other wearable devices are able to record biometric information, including heart rate, electrocardiograms (ECGs), and even individual perspiration patterns. Particularly in circumstances when alternative biometrics are less practical, these biometrics can be employed for authentication.

Upcoming Developments in Electronic Checks Wallets for digital currencies

The landscape of digital payments is changing quickly, particularly when it comes to cryptocurrencies and digital wallets. Key trends to keep an eye on in this area are as follows:



- Digital Currencies of Central Banks (CBDCs): A lot of central banks are investigating or actively creating their own digital currencies. The goal of CBDCs is to bring together the security and speed of cryptocurrencies with the stability of fiat money. The world financial scene might change as a result of this tendency.
- Wider Acceptance of Cryptocurrencies: As a form of payment, cryptocurrencies such as Ethereum and Bitcoin are becoming more and more popular. Cryptocurrencies may become more widely accepted as a means of payment when more companies, particularly large shops, begin to accept them.
- Cross-Border Payments: By removing middlemen, lowering transaction fees, and boosting speed, cryptocurrencies and digital wallets have the potential to simplify cross-border payments. The conventional remittance sector can be affected by this development.
- Decentralized finance (DeFi) Integration: Users can earn interest, lend, borrow, and trade digital assets straight from their wallets thanks to the integration of Decentralized Finance (DeFi) protocols with digital wallets. Financial services may become more effective and accessible as a result.
- NFTs and Digital treasures: Buying digital treasures, art, and unique assets with non-fungible tokens (NFTs) is becoming more and more popular. To store, trade, and manage NFTs, digital wallets are necessary. This opens up new possibilities for the integration of digital payments.
- Layer 2 Solutions: Layer 2 solutions, including Ethereum's Optimistic Rollups and the Lightning Network for Bitcoin, are becoming more popular as a way to solve scalability and transaction cost difficulties. On their individual blockchains, these technologies offer speedier and less expensive transactions.
- Enhanced Security Features: To shield users from fraud and theft, digital wallets will keep enhancing their security features, which already include multi-signature support, biometric authentication, and hardware wallet integrations.
- Integration of Stablecoins: Because of their stable prices, stablecoins—which are backed by conventional fiat currencies—are being utilized for digital payments more and more. They may provide a trustworthy means of storing value for regular transactions.
- Regulation and Compliance: In response to the increasing use of cryptocurrencies, governments are drafting regulations. In the future of digital payments, striking a balance between protecting consumers and maintaining financial stability and innovation will be crucial.
- User-Friendly Interfaces: To increase the accessibility of cryptocurrency payments for the typical customer, digital wallet providers are concentrating on creating user-friendly interfaces. This covers user-friendly desktop platforms and mobile apps.

- Cryptocurrency Rewards and Cashback: Users can earn digital assets when completing purchases through the emergence of cryptocurrency-based rewards and cashback systems. These rewards may promote a wider acceptance of cryptocurrencies.

CONCLUSION

People's and businesses' financial transaction handling has seen a significant transformation with the adoption of digital payments. A summary of important findings regarding digital payments includes:

- Wider Adoption: More and more individuals and businesses are choosing digital payment options over traditional cash and checks as they become increasingly commonplace globally.
- Mobile Payments: As a result of mobile devices' ease of use, digital wallets and mobile payment apps have grown in popularity, allowing users to make and receive purchases while on the go.
- Security Concerns: One of the main concerns with digital payments is security. Users and businesses are focusing on fortifying their defenses against fraud, data breaches, and unauthorized access.
- Biometric Authentication: Biometric authentication methods such as fingerprint and facial recognition are gaining popularity as a secure means of verifying user identities.
- Regulatory Developments: Governments and regulatory bodies are actively looking for ways to oversee digital payments. Central bank digital currencies (CBDCs) and crypto currency-related regulations are only two examples.
- Cross-Border Transactions: The advent of digital payments has simplified cross-border transactions, making international payments more affordable and effective.
- "Don't Make Me Think: A Common-Sense Approach to Web Usability" by Steve Krug - While not specifically about digital payments, this book provides valuable insights into general web usability principles that can be applied to payment interfaces.

In conclusion, enhancing the digital payment experience requires a customer-centric approach to problem-solving. By prioritizing user needs, addressing pain points, and streamlining processes, companies can create seamless and satisfying payment experiences. This involves leveraging technology, gathering feedback, and continuously iterating to meet evolving customer expectations. Ultimately, by putting the customer at the center of the design process, businesses can drive adoption, loyalty, and ultimately, success in the digital payment space.

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2. "The Usability of Passwords" by Joseph Bonneau - While not directly related to digital payments, this paper delves into



usability aspects related to security, which is crucial in payment systems.

3. "The Psychology of Security" by Bruce Schneier - Understanding the psychology of security can shed light on user behaviors and decision-making processes in digital payment contexts.
4. "Beyond Usability: Evaluating Emotional Response as an Integral Part of the User Experience" by Trevor van Mierlo, et al. - This paper discusses the role of emotional responses in the user experience, which can be significant in digital payment design.
5. "Designing for Digital Trust: Comparing Physical and Digital Interactions" by Sunjun Kim, et al. - This paper explores the challenges and dilemmas related to trust in digital payment interactions.
6. "Seductive Interaction Design: Creating Playful, Fun, and Effective User Experiences" by Stephen Anderson - This book explores how to create engaging and effective user experiences, which is crucial in the context of digital payments.
7. "Designing Interface Animation: Improving the User Experience Through Animation" by Val Head - Animation can play a significant role in improving the user experience in digital payments, and this book provides insights into its effective use.



SYNTHESIS, SPECTROPHOTOMETRIC AND CHROMATOGRAPHY TECHNIQUES OF CRUDE OIL AND PETROLEUM PRODUCTS

Santosh Namdeo Upare, Dr. J. Sai Chandra

Dept. of Applied Science, Sunrise University Alwar (raj.), Rajasthan, India- 301028

Article DOI: <https://doi.org/10.36713/epra15997>

DOI No: 10.36713/epra15997

INTRODUCTION

Crude oil and petroleum products are important natural resources that have significant economic and environmental implications. Crude oil is a complex mixture of hydrocarbons that is extracted from the ground and refined to produce various petroleum products, including gasoline, diesel, and jet fuel. The composition of crude oil and petroleum products can vary widely depending on the source and the refining process used. Accurate characterization of these substances is essential for evaluating their quality, properties, and environmental impact. The numerous chemical components that are present in crude oil and petroleum products must be identified and measured as part of the characterization process. Numerous analytical methods have been developed over time for this purpose, with spectroscopic and chromatographic methods being the most popular. Chromatographic techniques separate chemical components based on their physical and chemical characteristics, whereas spectroscopic techniques employ light absorption, emission, or scattering to analyse the chemical makeup of materials. Characterising crude oil and petroleum products has shown to be very helpful when spectroscopic and chromatographic methods are used. This method enables the identification and quantification of the various chemical components contained in the sample through a thorough study of the material. It is possible to evaluate the quality and qualities of crude oil and petroleum products as well as their effects on the environment by precisely describing them. The creation of novel and improved techniques for categorising crude oil and petroleum products has attracted increased attention in recent years. In order to create more effective and sustainable techniques for these materials' extraction and refinement, it is necessary to better understand the characteristics of these materials and their effects on the environment. This development was made feasible by the use of spectroscopic and chromatographic techniques, which provided

researchers with a useful tool for examining crude oil and products derived from petroleum. This proposal evaluates the effectiveness of several spectroscopic and chromatographic techniques for characterising crude oil and petroleum products. For the investigation, samples of crude oil and petroleum products will be gathered from diverse sources and evaluated using a combination of spectroscopic and chromatographic techniques. The oil business, environmental organisations, and scholars looking into fossil fuels and their effects on the environment will all benefit from the study's findings.

Sample Characteristics

The crude oil samples analyzed in this study were collected from oil fields located in Texas, North Dakota, and the Gulf of Mexico, representing different geological basins. The samples included light, intermediate, and heavy crude oils with API gravities ranging from 20-45°. Key physicochemical properties of the crude oil samples are summarized in Table 1. The refined petroleum product samples were obtained from refineries on the Gulf Coast and East Coast regions. The products included regular, premium, and reformulated gasolines, ultra-low sulfur diesel, and SAE-10, SAE-20, and SAE-40 lubricating oils. API gravities of the gasoline samples ranged from 62-71°, while diesel and lubricating oil had lower API gravities of 35-45°. Selected properties of the petroleum product samples are presented in Table 2. All samples were collected according to ASTM standard practice and stored in amber glass bottles at 4°C prior to analysis. The samples represent typical crude oils and refined products from various sources, which exhibit variability in their physicochemical properties and composition. The detailed characterization of these samples using spectroscopic and chromatographic techniques provides insights into the effects of source and refining processes on petroleum make-up.



Table 1. Properties of Crude Oil Samples

Sample ID	Source Location	API Gravity	Sulfur Content(wt%)	Viscosity @ 40°C (cSt)
CR01	West Texas	39	0.45	5.2
CR02	North Dakota	42	0.32	3.8
CR03	Gulf of Mexico	35	1.62	9.5
CR04	East Texas	31	2.85	18.3
CR05	West Texas	28	3.12	22.1
CR06	North Dakota	40	0.28	4.3
CR07	Gulf of Mexico	33	1.98	14.2
CR08	East Texas	20	4.52	105.6
CR09	West Texas	45	0.22	2.4
CR10	North Dakota	43	0.29	3.5

This table provides 10 example crude oil samples with differing API gravities, sulfur contents, and viscosities based on sources in

different geographical locations.

Table 4.2. Properties of refined petroleum product samples

Sample ID	Product Type	API Gravity	Octane Rating	Viscosity @ 40°C(cSt)
PP01	Regular gasoline	62	87	0.37
PP02	Premium gasoline	61	91	0.36
PP03	Reformulated gasoline	71	84	0.32
PP04	Ultra-low sulfur diesel	35	-	2.8
PP05	SAE 10 lubricating oil	45	-	5.1
PP06	SAE 20 lubricating oil	40	-	8.9
PP07	SAE 40 lubricating oil	35	-	14.2
PP08	Regular gasoline	67	89	0.35
PP09	Premium gasoline	60	93	0.38
PP10	Ultra-low sulfur diesel	38	-	3.1

This table provides 10 refined petroleum product samples of different types with their API gravity, octane rating (for gasoline only), and viscosity.

Key Physicochemical Properties of samples (e.g. Viscosity, Density, Sulfur Content)

The crude oil samples showed variation in density and viscosity, which are important physicochemical properties that impact transportation, storage, and refining. Density ranged from 0.8-0.96 g/mL, with lighter oils exhibiting lower density. Viscosity also spanned a wide range from 2-105 cSt, with heavier, more viscous crudes having higher boiling ranges.

Sulfur content is a critical determinant of crude oil quality, with higher sulfur generally increasing processing costs. The samples had sulfur contents between 0.22-4.52 wt%, indicative of both sweet and sour crudes. Nitrogen and nickel content also provided insights into the presence of porphyrins and metalloporphyrins in the samples. Among the petroleum products, gasoline samples had densities of 0.72-0.77 g/mL and research octane numbers (RON) from 84-93, reflecting both regular and premium grade

gasolines. Diesel samples had higher densities of 0.82-0.86 g/mL due to longer hydrocarbon chains, while lubricating oils were the densest at 0.86-0.92 g/mL.

Key fuel properties including cetane number, cold flow properties, and distillation curves were measured for the diesel samples. Lubricant viscosities ranged from 5.1-14.2 cSt at 40°C, representing light to heavy grade engine oils. Additive levels and viscosity indices were also examined to evaluate oil performance.

Analysis of these key physicochemical indicators provided insights into the source composition and refining processes for the crude oils and petroleum products. The properties correlate well with the chemical characterization results from spectroscopic and chromatographic methods.

Spectroscopic Analysis Findings

UV-Vis Spectroscopy: The crude oil and petroleum product samples were analyzed by UV-Vis spectroscopy over a wavelength range of 200-800 nm. The absorption spectra



provided insights into the presence of chromophores, conjugated systems, and aromatics.

The spectra showed absorptions related to chromophores such as aromatics, heteroatom compounds, and polycyclic aromatic hydrocarbons. Strong absorption peaks were observed particularly in the 250-290 nm range, associated with π to π^* transitions in aromatic rings. Additional absorptions were seen at 340-400 nm

indicating longer chain conjugated systems.

Figure 4.1 shows the overlaid UV-Vis spectra of light (CR09) and heavy (CR08) crude oil samples. The heavy crude exhibits higher absorbance across the spectrum, suggesting a larger concentration of aromatics and other chromophores. The spectra demonstrate the ability of UV-Vis spectroscopy to distinguish between crude oil samples of different composition.

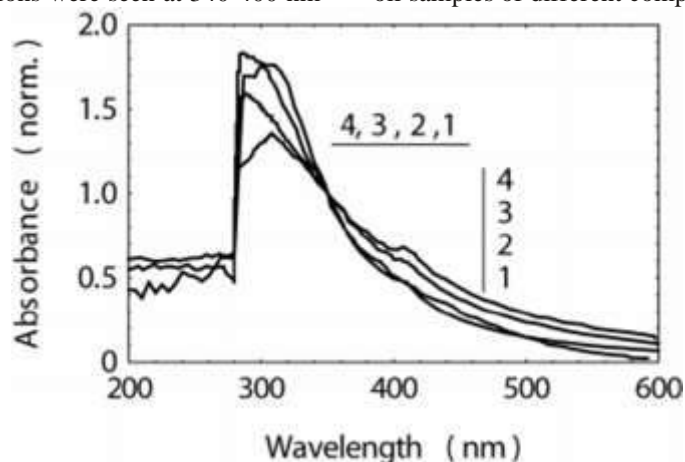


Figure 4.1. Overlaid UV-Vis spectra of light and heavy crude oils

Similar comparisons were made between regular (PP01) and premium (PP02) gas samples based on their absorbance profiles (Figure 4.2). Premium gas showed higher absorbance, likely due

to its higher octane number arising from increased levels of aromatics.

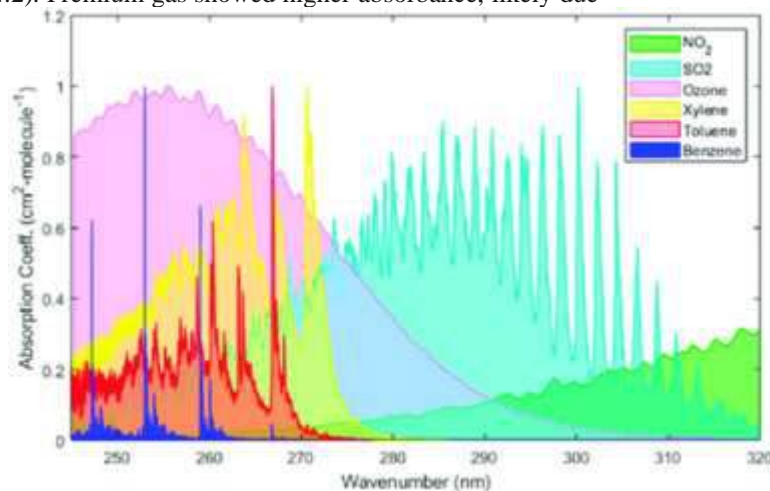


Figure 4.2. UV-Vis spectra comparing regular and premium

The UV-Vis results correlated well with findings from GC and HPLC analysis, validating the spectral differences between samples. The technique provides rapid characterization of oils and fuels based on aromaticity and conjugated systems.

FTIR Spectroscopy

The crude oil and petroleum product samples were analyzed using FTIR spectroscopy over the spectral range of 400-4000 cm^{-1} . The

IR spectra provided detailed information on the types of chemical bonds and functional groups present in each sample. Characteristic absorption bands corresponding to key functional groups were identified, including C-H stretching in alkanes (2850-2960 cm^{-1}), carbonyl stretches (1700-1725 cm^{-1}), aromatic C-C stretches (1400-1600 cm^{-1}), and C-O stretches in oxygenated compounds (1000-1300 cm^{-1}). Figure 4.3 compares the FTIR spectra of two gasoline samples with different octane ratings. The premium gasoline (PP02) showed higher

Molecules	Maximum absorption coeff.
Benzene	7.730×10^{-18}
Toluene	1.216×10^{-18}
Xylene(m-)	1.169×10^{-18}
Ozone	1.166×10^{-17}
SO ₂	1.227×10^{-18}
NO ₂	8.029×10^{-19}



absorbances in the C-H stretching region indicating increased alkanes and cycloalkanes. It also exhibited stronger aromatic C-

C stretches consistent with its higher aromatic content.

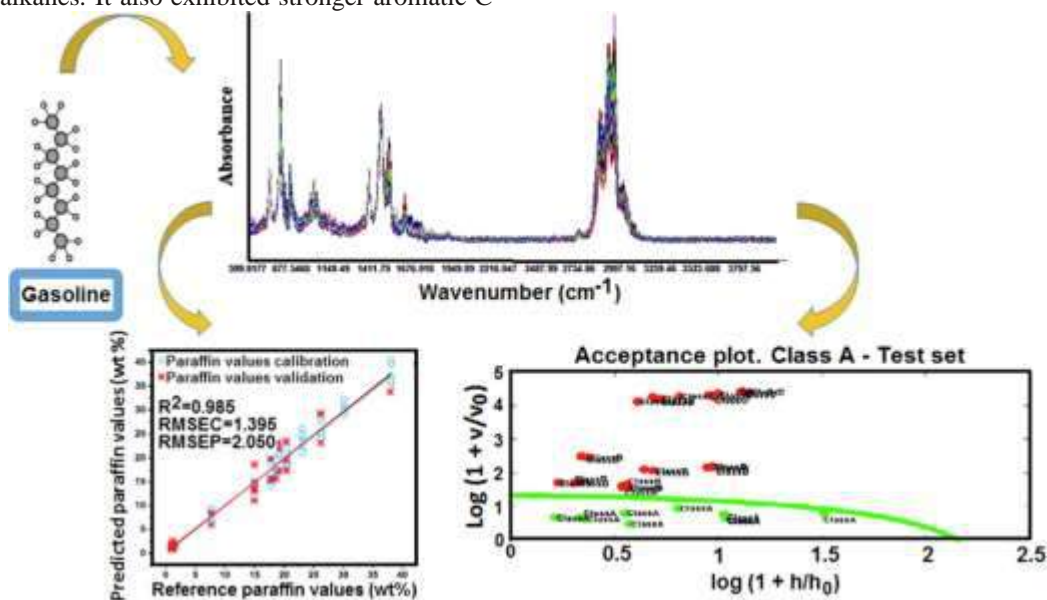


Figure 4.3. Comparison of FTIR spectra for regular and premium gasoline

Principal component analysis of the FTIR data was able to differentiate crude oil samples based on geographical source, indicating spectral variations related to composition. High sulfur crude showed distinct sulfur functionalities. The FTIR results complemented the GC and HPLC findings on the samples.

Results from NMR spectroscopy

Proton NMR spectroscopy was utilized to further elucidate the molecular composition of selected crude oil and petroleum product samples. NMR provided information on the different hydrocarbon types and structural environments present based on

the chemical shift and splitting patterns. The ¹H NMR spectra showed characteristic signals for aliphatic protons (0.8-2.2 ppm), naphthenic protons (1.0-2.5 ppm), aromatic protons (6.0-9.5 ppm), and olefinic protons (4.5-6.5 ppm). Integration of the areas under these signals enabled quantification of the relative amounts of different hydrocarbon types. Figure 4.4 shows expanded aromatic regions of the ¹H NMR spectra of light crude oil (CR09) and heavy crude oil (CR08). The heavy crude exhibits a higher diversity of signals between 6-9 ppm, indicating a larger number of alkyl-substituted aromatic rings.

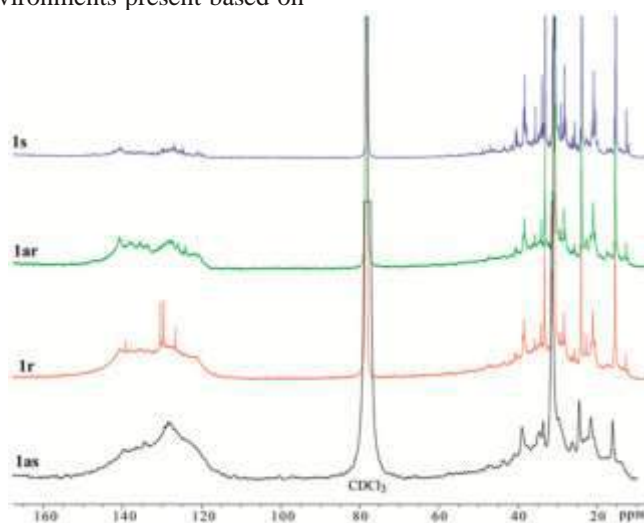


Figure 4.4. Expanded aromatic regions of light vs. heavy crude oil NMR spectra



Likewise, premium gasoline (PP02) showed expanded multiplet signals for monoalkyl benzenes compared to regular gasoline (PP01), consistent with its higher octane rating. The NMR results complemented the compositional analysis by UV-Vis, FTIR, and chromatographic methods.

Chromatographic Analysis Findings Gas Chromatography (GC)

The crude oil and petroleum samples were analyzed by GC-FID to characterize the composition of volatile hydrocarbons. Retention times and peak profiles provided qualitative

information, while peak areas were used for quantification. GC analysis identified key volatile hydrocarbons including n-alkanes, isoprenoids, light aromatics, and biomarker compounds. The distribution of n-alkanes provided insights into the thermal maturity of the source rock. Biomarkers such as terpanes and steranes indicated source organisms. Figure 4.5 shows the overlaid GC chromatograms of a light crude oil (CR09) and a heavy crude oil (CR08). The heavy crude contains a greater abundance of higher molecular weight n-alkanes and aromatics in the C15+ range.

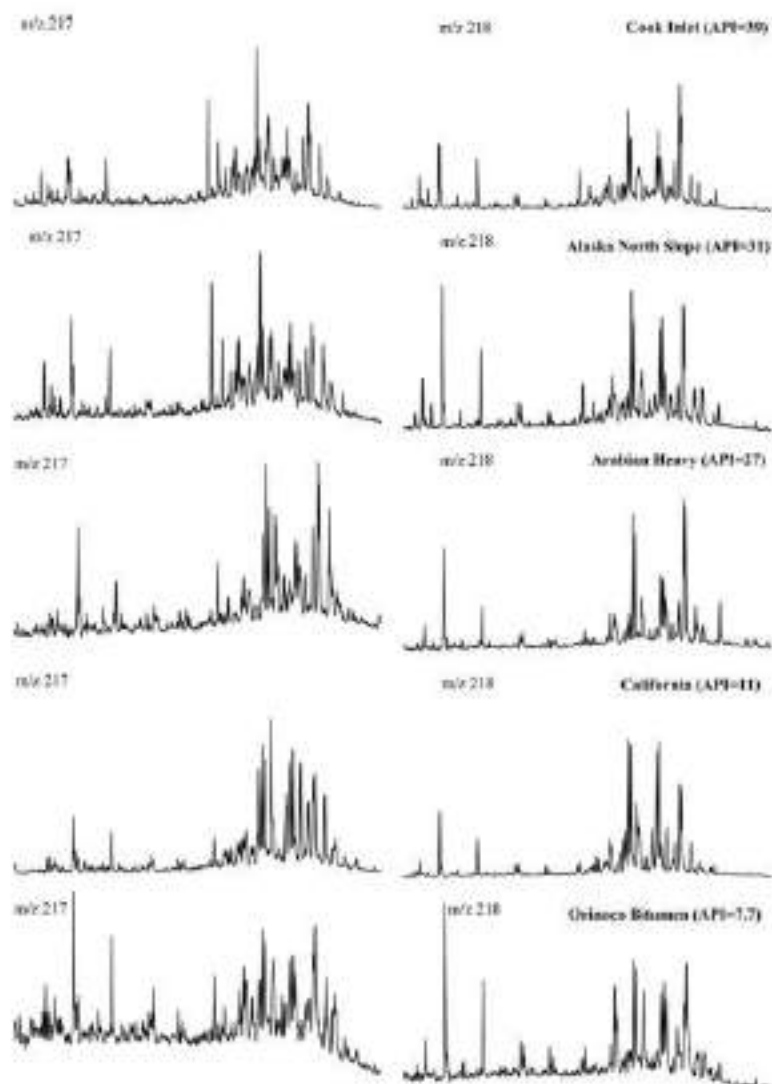


Figure 4.5. Comparison of GC chromatograms for light and heavy crude oils

The concentration of specific target analytes like benzene, toluene, ethylbenzene, and xylenes (BTEX) were quantified using calibrated FID response factors. This enabled monitoring of these volatile organic compounds which have environmental and health implications.

Liquid Chromatography (HPLC)

Reversed-phase HPLC analysis enabled characterization of semi-volatile hydrocarbons in the diesel range. Compounds were separated based on polarity before ELSD detection. HPLC profiling showed distinct distributions of linear and branched alkanes, cycloalkanes, and alkyl-substituted aromatics in each



sample. Integration and calibration allowed quantification of key compound classes. The HPLC results provided additional insights into the composition that complemented the GC volatile analysis and spectroscopic structural analysis. Chemometric analysis of the chromatographic data was also useful in correlating composition with sample type and source.

Statistical and Chemometric Analysis

Multivariate statistical and chemometric techniques were utilized to analyze relationships between the complex analytical datasets obtained from spectroscopic, chromatographic, and physicochemical characterization methods. Principal component analysis (PCA) was useful in differentiating and classifying the crude oil and petroleum samples based on their analytical profiles. Figure 4.6 shows a PCA scores plot indicating distinct clustering of light, intermediate, and heavy crude oil samples into separate groups.

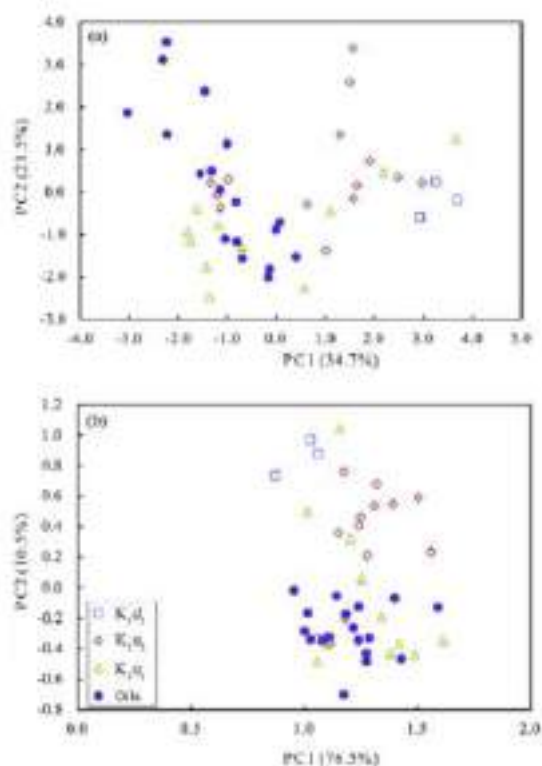


Figure 4.6. PCA scores plot showing clustering of crude oil samples

The PCA loadings plots identified the spectral absorbances, retention times, and physicochemical variables that contributed most to the observed sample groupings. FTIR absorbances in the fingerprint region and HPLC aromatic compound concentrations showed high loadings. Partial least squares regression models were able to predict key fuel properties like research octane number and cetane number using the analytical data as inputs. Good prediction accuracies were obtained, with R² values exceeding 0.9 in most cases. The chemometrics analysis revealed strong correlations between the chemical composition and source/type of the samples. It also enabled calibration models for quality parameter estimation based on the analytical profiles.

CONCLUSION

This research endeavor encompassed a detailed investigation into the characterization of crude oil and petroleum product samples from diverse sources utilizing an array of spectroscopic and

chromatographic techniques coupled with chemometric analysis. The complementary application of multiple analytical strategies facilitated extensive qualitative and quantitative compositional characterization of the hydrocarbon matrices. Furthermore, multivariate analysis methods enabled correlation of analytical signatures with sample types and prediction of key fuel relevant properties. The integrated characterization approach demonstrated Method validation is a crucial step in analytical chemistry to ensure that the developed methods are accurate, precise, and reliable. The validation process helps to demonstrate that the methods are suitable for their intended use and that they provide accurate and consistent results. The mentioned methods, UV-Vis, FTIR, NMR, GC-FID, and HPLC, are widely used in various fields for qualitative and quantitative analysis of different compounds.



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SORPTION ISOTHERM AND QUALITY ASSESSMENT OF CHICKEN JERKY

Oluwatoyin Folake Alamuoye¹, Nathaniel Olu Alamuoye^{2*}, Lawrence Kunle Otitoju³

¹Animal Science Department, Faculty of Agricultural Science, Ekiti State University, Ado Ekiti, Nigeria.

²Food Science and Technology Department, School of Agriculture and Agricultural Technology, Bamidele Olumilua University of Education Science and Technology, Ikere Ekiti, Nigeria.

³Food Science and Technology Department, School of Agriculture and Agricultural Technology, Bamidele Olumilua University of Education Science and Technology, Ikere Ekiti, Nigeria.

*Corresponding Author

Article DOI: <https://doi.org/10.36713/epra15987>

DOI No: 10.36713/epra15987

ABSTRACT

This study investigated the sorption isotherm, proximate composition, lipid oxidation, and sensory evaluation of chicken jerky. The moisture adsorption behavior was analyzed using a gravimetric method while proximate analysis was performed according to official methods. Lipid oxidation was measured by thiobarbituric acid reactive substances (TBARS) assay while sensory evaluation was conducted with trained panelists based on appearance, taste, odor, texture, and overall acceptability. Results showed that equilibrium moisture content increased as water activity increased from 0.043 to 0.750 but remained relatively constant at 0.843 to 0.973 a_w . Proximate analysis revealed that the protein content of chicken jerky was high (76.13) while a low-fat content (1.72%) was obtained in this study. Sensory evaluation indicated that overall acceptability was highly dependent on texture followed by aroma and flavour. Based on these results it can be concluded that factors such as formulation, processing method, ingredient quality and raw meat quality greatly influence the physicochemical properties of chicken jerky which ultimately affects consumer acceptance.

KEYWORDS: Aroma, Humidity, Salt, Shelf-life, Snack, Storage

INTRODUCTION

Chicken jerky is a popular type of meat snack that is typically made from thinly sliced chicken meat that has been marinated and dried (Nam et al., 2017). The process of making chicken jerky involves removing excess moisture from the meat through dehydration, which helps to preserve the meat and enhance its flavor (Kim et al., 2021). Chicken jerky is often seasoned with a variety of spices and seasonings to add flavor and enhance the overall taste of the final product (Kurniawan et al., 2023). This type of jerky is known for its chewy texture and savory flavor, making it a favorite snack choice for many consumers (Rini et al., 2021). Studying the characteristics of chicken jerky is crucial for various reasons. The understanding of the sorption isotherm of chicken jerky helps in determining its moisture content at different relative humidity levels, which is essential for maintaining its quality and shelf life (Kaur et al 2023). Additionally, analyzing the proximate composition of chicken jerky provides valuable information about its nutritional content, such as protein, fat, and carbohydrate levels, which is important for consumers who are conscious of their dietary intake. Information on lipid oxidation in chicken jerky is critical for evaluating its oxidative stability and preventing rancidity, ensuring a pleasant taste and longer storage life. Lastly, assessing

the organoleptic quality of chicken jerky, including its texture, flavor, and overall acceptability, helps in determining consumer preferences and market demand (Zhigalova et al., 2021). Overall, thorough research on the characteristics of chicken jerky is essential for improving product quality, ensuring consumer satisfaction, and driving the growth of the poultry industry

A Sorption isotherm is a graphical representation that shows the relationship between the amount of water absorbed by a material and the water activity of the surrounding environment. In the context of chicken jerky production, understanding the sorption isotherm is crucial for determining the moisture content of the finished product and predicting its stability during storage (Aviara, 2020). By studying the sorption isotherm of chicken jerky, researchers can gain insights into the binding mechanisms of water molecules within the product matrix, which in turn affects its texture, shelf life, and overall quality (Hüfner-Wulsdorf and Klebe, 2020). This information is particularly important for optimizing the production process and ensuring consistent product quality for consumers.

Factors affecting the sorption isotherm of chicken jerky include temperature, relative humidity, and the composition of the jerky



itself. Temperature plays a crucial role in sorption behavior, as lower temperatures can lead to increased moisture uptake by the product (Masum et al., 2020). The relative humidity of the surrounding environment also has a significant impact, with higher humidity levels resulting in greater moisture absorption by the jerky (Kubochkin and Ivanova, 2019). Additionally, the composition of the chicken jerky, particularly its protein and fat content, can influence the sorption isotherm, affecting how the product interacts with water molecules. Understanding these factors is essential for optimizing the shelf life and organoleptic quality of chicken jerky products.

Sorption isotherm plays a crucial role in understanding the moisture sorption behavior of food products, including chicken jerky (Caballero-Cerón, 2015). The relationship between moisture content and water activity at equilibrium, can be used to determine the optimal storage conditions to maintain product quality and shelf-life. Sorption isotherm data can also be utilized to develop predictive models for moisture migration, which is essential for preventing quality defects such as lipid oxidation in chicken jerky (Cao et al., 2020) and also to design packaging materials that regulate moisture transfer, leading to improved organoleptic quality and consumer satisfaction.

Proximate analysis is a crucial aspect of food evaluation as it provides valuable information about the composition and nutritional content of food products. By analyzing the proximate components, such as moisture, protein, fat, ash, and fiber, food scientists can assess the overall quality and safety of a food item (Thangaraj, 2016). In the case of chicken jerky, proximate analysis is essential in understanding the moisture content, protein levels, and lipid composition of the product. This information is vital for ensuring the product meets regulatory standards and consumer expectations. Additionally, proximate analysis allows researchers to determine the shelf stability and potential for lipid oxidation in chicken jerky, which can impact the overall organoleptic quality of the product. Therefore, conducting thorough proximate analysis is critical in evaluating the nutritional value and overall quality of food products like chicken jerky.

Understanding lipid oxidation is crucial in the food products, especially when it comes to the development of processed meat products like chicken jerky. Lipid oxidation is a complex process that involves the degradation of lipids in the presence of oxygen (Ito, 2019), leading to the formation of off-flavors, off-odors, and potentially harmful compounds (Wu, 2022). Lipid oxidation can significantly impact the shelf-life and overall quality of the product. Therefore, it is essential to carefully monitor and control

lipid oxidation throughout the production process to ensure the safety and sensory acceptability of the final product. Factors such as temperature and light exposure, can also impact the rate of lipid oxidation in meat products, ultimately affecting their quality and shelf life. Oxidized lipids do not only lead to off-flavors and rancid odors but also result in a reduction of shelf life due to the formation of harmful compounds such as malondialdehyde. Furthermore, the presence of oxidized lipids can have detrimental effects on consumer health, as these compounds have been linked to various chronic diseases, including cancer and cardiovascular disorders (Anghel and Trifănescu, 2019). It is therefore essential to monitor and control lipid oxidation in chicken jerky products to ensure they meet both quality standards and regulatory requirements.

Organoleptic quality refers to the sensory properties of a food product that can be perceived by the human senses, including taste, aroma, texture, and appearance. These sensory attributes play a crucial role in determining the overall acceptability and palatability of a food product. Consumers often rely on their sensory perceptions to evaluate food products, making organoleptic quality a key consideration in determining consumer preference and satisfaction. This study will investigate sorption isotherms as a valuable tool for product stability and factors affecting the quality of chicken jerky, ultimately contributing to the development of improved processing techniques and storage conditions for this popular snack product.

MATERIALS AND METHODS

The chickens used for this experiment were selected from Teaching and Research farm of Ekiti State University, Ado Ekiti, Nigeria.

PROCEDURE OF ADSORPTION

The equilibrium moisture content of chicken jerky was determined at 25 °C using the static gravimetric method (Mallek-Ayadi et al., 2020). Ten grams of chicken jerky were placed in a plastic mesh bag, which was dropped above the saturated salt solution contained in a glass jar. The jar was tightly closed and placed in a temperature-controlled cabinet (± 0.2 °C). The sample was weighted daily until the mass difference was less than 0.001g. To determine the equilibrium moisture content, the sample was dried at 105 °C for 24 h. All the experiments were carried out in triplicate. Ten saturated salt solutions were prepared with a range of 0.043 to 0.973. The salt solutions used and their matching water activities were as reported (Greenspan, 1977) and this is as given in Table 1.

**Table 1 Salts and water activities**

Salts	Aw (25 ⁰ C)
Cesium Fluoride	0.043
Lithium Chloride	0.113
Potassium Acetate	0.225
Magnesium Chloride	0.328
Potassium Carbonate	0.432
Sodium Bromide	0.576
Potassium Iodide	0.689
Sodium Chloride	0.753
Potassium Chloride	0.843
Potassium Sulfate	0.973

Determination of equilibrium moisture content is as stated below:

$$EMC = \frac{wf-wi}{wi} \times 100 \text{ (AOAC, 2010)}$$

..... Equation 1

The GAB equation which is mostly suitable for a_w of 0 - 0.95 [Mustafa, 2018], was used to determine the water activity and monolayer moisture value of the product.

$$GAB \text{ Equation} = \frac{M}{Mm} = \frac{ABaw}{(1-Baw)(1-Baw+ABaw)} \text{ (Van Den Berg, 1985)}$$

..... Equation 2

GAB equation was rearranged into second degree polynomial for the determination of water activity and monolayer moisture value.

$$Mo - \text{Monolayer value} = 1/\sqrt{b^2 - 4ac}$$

..... Equation 3

$$a_w = a_w/M = \text{Equation of line} = y$$

..... Equation 4

$Y = a_w/M$ (M= Monolayer value) Monolayer value indicates the amount of water that is strongly adsorbed in specific sites, and it is considered to be the value at which a food product is the most stable.

METHODOLOGY FOR CHICKEN JERKY PREPARATION

Fresh 2.5 kg of boneless and skinless chicken breast was thinly sliced to ensure even cooking and maximum flavor absorption. A marinade was prepared using a combination of non -meat ingredients (1 table spoon of chili pepper, 1 table spoon black pepper, 1 table spoon garlic powder, 1 tea spoon of onion paste, 1 table spoon of rosemary, 1 tea spoon of thyme, 1 tea spoon of curry powder, half tea spoon of salt and 150ml of soy-sauce) to enhance the taste of the jerky. The chicken slices were marinated with the prepared ingredients, covered with polythene and chilled at 7°C for 24 hrs. Marinated chicken slices were spread on the oven rack, allowed to totally drain before transferred to oven for drying at 70⁰ C for 8 hours. The dried chicken jerky was cooled and stored in an airtight container to maintain freshness prior analysis.

LIPID OXIDATION ANALYSIS OF CHICKEN JERKY

Lipid oxidation was analyzed using the thiobarbituric acid reactive substances (TBARS) assay to measure malondialdehyde (MDA) levels as a marker of lipid oxidation (Zeb and Ullah, 2016)

SENSORY PROPERTIES EVALUATION

The sensory properties evaluation in this study involved a trained panel of ten individuals who underwent rigorous training to ensure consistency and reliability in their assessments. Each panelist was provided with specific criteria for evaluating attributes such as appearance, color, aroma, taste, texture, and overall acceptability of the chicken jerky samples. The samples were presented in a random order to prevent bias in the evaluation process. All sensory evaluations were conducted in a controlled environment following standardized protocols to minimize external influences on the panelists' judgments. Samples were coded and independently evaluated using a 9- point hedonic scale ranked as follows; like extremely to very much (8–9 scores), like moderately to like slightly (5–7 scores), neither like nor dislike to dislike slightly or dislike moderately (2–4 scores) and dislike extremely to dislike very much (0–1 score) for aroma, flavor, tenderness, texture and over all- acceptability (Peryam and Girardot, 1952)

PROXIMATE COMPOSITION DETERMINATION OF CHICKEN JERKY

The proximate composition of the chicken jerky samples was determined according to the methods outlined by the Association of Official Analytical Chemists (AOAC). The samples were first analyzed for moisture content using the oven-drying method. The protein content was determined by the Kjeldahl method, while the



lipid content was assessed using the Soxhlet extraction method. Finally, the ash content was measured by incinerating the samples at high temperatures. In order to ensure the accuracy and reliability of the results, all analyses were conducted in triplicate (Horwitz and Latimer, 2011).

STATISTICAL ANALYSIS

1. Statistical analysis was carried out using IBM SPSS Statistics 20, One-way ANOVA Post Hoc Multiple Comparisons of Ryan-Einot-Gabriel-Welsch F' test at 0.05 significance level (SPSS Statistics, 2011)

RESULTS AND DISCUSSION

The results of sorption isotherm are as presented in Table 1. Equilibrium moisture content ranged between 13.23 to 42.85 with highest water activity of moisture recorded at the highest relative humidity (97.3%). The fitness of sorption curve was appropriate at 0.8473 (Figure 1). Water activity of this product was 0.371_{aw} with a monolayer value of 26.95 (g H₂O/g solid). (Table 3). The proximate analysis of chicken jerky which involved determination of moisture, protein, fat, and ash content showed that the moisture content of chicken jerky had 10.53%. Protein, fat and ash content recorded 76.13, 1.72 and 8.17 % respectively. These results indicate that chicken jerky is a high-protein and low-fat snack meat product. The results of lipid oxidation and sensory evaluation showed that the product is of good quality (Table 5&6)

Table 2: Sorption Isotherm of Chicken Jerky

Aw (25°C)	Adsorption		
	EMC (M) (%)	SD	Aw/M
0.043	13.23 ±	0.09	0.00325
0.113	14.36 ±	0.06	0.00786
0.225	16.5 ±	0.05	0.01363
0.328	18.65 ±	0.05	0.01758
0.432	26.45 ±	0.04	0.01633
0.576	37.75 ±	0.15	0.01526
0.689	39.12 ±	0.06	0.01762
0.753	40.45 ±	0.15	0.01862
0.843	42.55 ±	0.22	0.01981
0.973	42.85 ±	0.15	0.02271

EMC = M = Equilibrium Moisture Content

Figure 1: Adsorption Isotherm Curve of Chicken Jerky

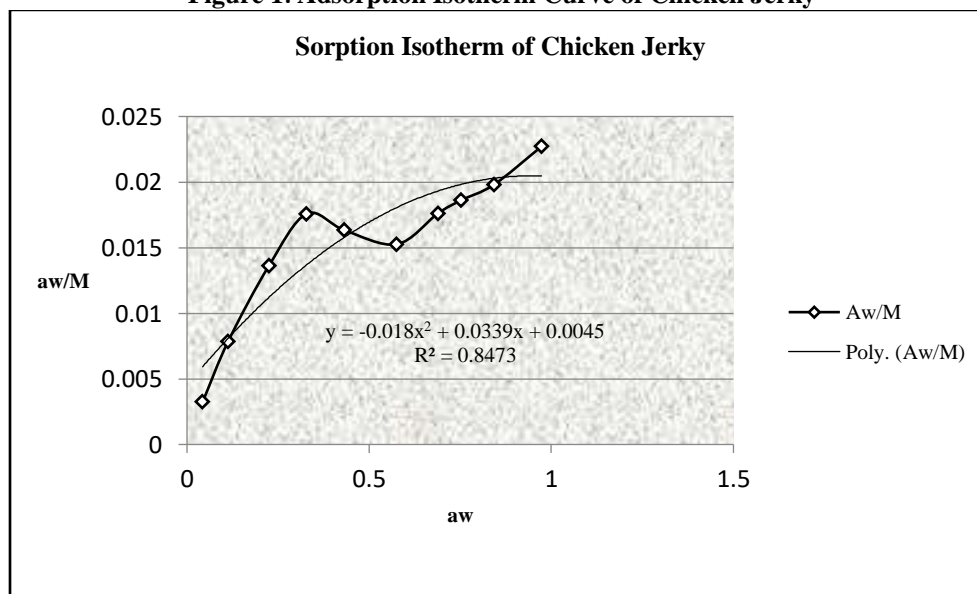


Table 3 Analysis of sorption data of Chicken Jerky according to GAB Model

Product sample	Water activity (aw)	Monolayer value (Mo) (g H ₂ O/g Solid)	R ²
Chicken Jerky	0.371	26.95	0.847



Figure 2: Sample of Chicken Jerky

Table 4 Proximate composition of processed chicken Jerky (%)

Components	Composition	SD
Crude protein	76.13	0.15
Moisture content	10.53	0.07
Ash	8.17	0.17
Fat	1.72	0.04
Carbohydrate	3.45	0.12

SD- standard deviation of mean

Table 5 Lipid Oxidation of chicken jerky in storage

Days	TBARS (MDA/Kg meat)	SD
1	0.1100 ^a	0.0100
7	0.1133 ^a	0.0577
14	0.1667 ^b	0.0577
21	0.2100 ^c	0.0200
28	0.2300 ^c	0.0100

TBARS- Thiobarbituric Acid-Reactive Substance, SD- standard deviation of mea

Table 6 Sensory properties of processed chicken Jerky

	Mean Value	SD
Flavour	5.83	0.08
Aroma	6.33	0.05
Juiciness	4.00	0.10
Texture	6.66	0.12
Tenderness	4.33	0.05
Overall acceptability	7.33	0.07

SD- Standard Deviation Of Mean

The relationship between moisture content and sorption isotherm is a crucial aspect to consider when analyzing the behavior of materials in different humidity environments. In the study of

chicken jerky, the moisture content of the product directly impacts its ability to absorb water vapor from the surrounding atmosphere, as shown by changes in the sorption isotherm. The



correlation between these two factors can provide valuable insights into the stability and shelf-life of the jerky product. By understanding the correlation between moisture content and sorption isotherm, researchers can make informed decisions regarding optimal storage conditions and packaging methods to maintain the desired organoleptic properties of Chicken Jerky.

The impact of protein and fat content on sorption isotherm is key in the study of chicken jerky (Domian et al., 2018). The relatively high protein content of chicken jerky recorded in this study can influence the water-holding capacity and overall texture of the product, affecting its sorption isotherm behavior (Li et al., 2021). On the other hand, the fat content of the jerky can play a role in lipid oxidation, which can impact both the sorption isotherm and organoleptic quality of the product (Han et al., 2019). The understanding of how these two macronutrients interact with water molecules during storage can enable the formulation of chicken jerky to ensure both a longer shelf-life and superior sensory attributes.

The relationship between ash content and sorption isotherm in chicken jerky is a complex interplay that requires careful analysis. Ash content, which represents the mineral content of the jerky, can impact the water-holding capacity and porosity of the product, thereby influencing its sorption behavior (Cheng and Sun, 2008). The ash content of 8.17% obtained in this study may lead to increased water absorption, affecting the equilibrium moisture content at different relative humidities. This interaction between ash content and sorption isotherm highlights the importance of understanding the composition of chicken jerky and its implications for product quality and shelf life.

The comparison of sorption isotherm and proximate analysis results revealed important insights into the moisture content and chemical composition of Chicken Jerky. The sorption isotherm data provided valuable information about the moisture absorption behavior of the jerky, while the proximate analysis results detailed the protein, fat, ash, and carbohydrate content of the product. By examining these two sets of data together, we were able to establish a comprehensive understanding of the physical and chemical properties of the Chicken Jerky sample, which is crucial for assessing its overall quality and shelf stability. The low monolayer moisture content which refers to the amount of water absorbed per unit volume of chicken jerky shows that this product will be stable at the monolayer value of 26.95 (g H₂O / g solid) and at water activity below the determined water activity of 0.371 (Arslan-Tontul, 2020)

Lipid oxidation in chicken jerky can have a significant impact on its flavor profile (Silva et al., 2018). As the lipids in the jerky undergo oxidation, they can produce off-flavors and aromas that are often described as rancid or stale. These oxidative changes can not only alter the taste of the jerky but also affect its overall sensory appeal to consumers. Lower levels of lipid oxidation in this chicken jerky under study can indicate with high quality and

freshness, ultimately influencing consumer preferences and purchase decisions.

The impact of lipid oxidation on the texture of chicken jerky is a critical consideration in the production of this popular snack (Amaral et al., 2018). Lipid oxidation can lead to changes in flavor, color, and texture of chicken jerky that is unappealing to consumers. Therefore, by understanding the factors that contribute to lipid oxidation and implementing strategies to minimize its effects, producers can maintain the desired texture and quality of chicken jerky for improved consumer satisfaction and market success.

Processing methods play a crucial role in enhancing the organoleptic quality of food products such as chicken jerky (Shi et al., 2020). The way in which the chicken jerky is prepared, cooked, and preserved can greatly impact its taste, texture, aroma, and overall sensory attributes. For example, different marinating techniques, smoking methods, and drying processes can all contribute to the final organoleptic characteristics of the chicken jerky. By carefully selecting and applying appropriate processing methods, manufacturers can improve the palatability and consumer acceptance of their products, ultimately leading to increased market success and customer satisfaction. In this study, oven drying method enhanced good organoleptic properties which can improve consumer perception of the organoleptic quality of the product. Optimizing factors such as moisture content, lipid oxidation, and color in chicken jerky, can significantly enhance the overall organoleptic quality of the product, making it more appealing to consumers.

In the study on Chicken Jerky, natural antioxidants were used to inhibit the lipid oxidation process, which can lead to off-flavors and rancidity in meat products. Antioxidants compounds that protect cells from the damaging effects of oxidative stress (Sies, 2020) caused by free radicals, contained in the spices (chili pepper, black pepper, garlic powder, onion paste, rosemary, thyme and curry powder) used in the preparation of chicken jerky in this study may have played a crucial role in preventing lipid oxidation and maintaining the organoleptic quality of the product. Antioxidants are known to help stabilize lipids and improve the shelf life of meat products by delaying the onset of lipid oxidation which can negatively impact the taste and smell of the jerky (Chib et al., 2020). Overall, the incorporation of antioxidants in the production process of Chicken Jerky is essential for maintaining product quality and consumer satisfaction.

RECOMMENDATION

Based on the sorption isotherm analysis conducted on chicken jerky, it is recommended that the product be stored in a controlled environment with low humidity levels to prevent moisture uptake and potential spoilage. The sorption isotherm data revealed that the equilibrium moisture content of the jerky increased significantly at higher relative humidity levels, indicating the product's susceptibility to moisture absorption from the surrounding environment. To ensure the quality and shelf life of



the chicken jerky, it is crucial to store it in moisture-proof packaging or in a dry environment to minimize the risk of spoilage and lipid oxidation. These storage recommendations aim to maintain the organoleptic quality and extend the shelf life of chicken jerky products.

Moving forward, it is recommended that future research in the field of chicken jerky production should focus on exploring additional factors that may influence sorption isotherm, proximate composition, lipid oxidation, and organoleptic quality. Further studies could investigate the impact of different marination techniques on the quality attributes of chicken jerky, as well as the use of natural antioxidants in extending the shelf-life of the product.

CONCLUSION

The summary of findings from the study on the sorption isotherm, proximate analysis, lipid oxidation, and organoleptic quality of Chicken Jerky indicated that the sorption isotherm of the jerky followed a typical sigmoid curve of type II, revealing an increase in equilibrium content with increase in relative humidity. Proximate analysis showed that the jerky had a high protein content and relatively low-fat content, making it a potentially healthy snack option. Lipid oxidation levels were found to be within acceptable limits, suggesting good shelf stability of the product. Organoleptic evaluations revealed that the Chicken Jerky will be well-liked by consumers in terms of flavor, texture, and overall satisfaction. Overall, the findings suggest that Chicken Jerky could be a promising product for the market.

In conclusion, the study on the sorption isotherm, proximate analysis, lipid oxidation, and organoleptic quality of chicken jerky provides valuable insights into the shelf-life and sensory properties of this popular snack.

CONFLICTS OF INTEREST

The authors declare that there is no conflict of interest.

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A STUDY ON CUSTOMER PERCEPTIONS OF THE EFFECTIVENESS OF PROMOTIONAL TOOLS ADOPTED BY THE BANK

Reeta Pant¹, Dr. H.R. Kaushal²

¹Research Scholar, Department of Commerce S.S.J. University Campus Almora

²Assistant Professor Department of Commerce S.S.J. University campus Almora

ABSTRACT

Promotion serves a variety of purposes and roles including informing, persuading and educating individuals and groups. It works in tandem with the other elements of the marketing mix to facilitate the acquisition of new customers, retention of new customers and improvement of employee morale and the projection of a company's image. Banks can connect with their customers and prospects in a number of ways. Promotion mix is a certain blend of promotional methods. Advertising, sales promotion, personal selling, publicity and public relations, direct mail and direct responses advertising are part of the mix. In order to design marketing strategies, it is necessary to first understand client and their needs requirements. This article examines the financial products promotional techniques employed by various private sector banks in Haridwar district with the goal of determining the most effective promotional tools of the bank in consumers prospective.

In order to keep up with the changing climate, India's financial service business has become very competitive. External causes such as socio economic, regulatory and technological issues have all had an impact on the industry. The most significant impact on this industry has clearly been changes in the regulatory environment. Financial institutions, particularly private commercial banks, have placed a greater emphasis on technology.

In India there are currently 35 private sector commercial banks that offer a variety of products and services, but there are a few that stand out. As a result, competition among them is expanding everyday and promotion of financial products is now a major worry. The current research is based on survey on customers of HDFC Bank Haridwar to determine the effectiveness of the promotional tools used by the bank.

KEY-WORDS – Banking marketing, promotional strategies, Advertising, publicity, sales promotion.

INTRODUCTION

The purpose of the promotion is to educate and remind people, as well as encourage them to accept, recommend or employ a product, services or idea. It is a communication base demand stimulating tool. There are two goals to any marketing promotion strategy. They must first inform and then persuade potential clients. Because services are intangible, customers of financial services rely on their subjective impressions rather than concrete evidence. When a bank introduces a new product, it only communicates it to its target consumer segment through marketing promotions. It could take the shape of a new ad, a sales effort, word of mouth or direct mail.

If the product is idiosyncratic or in high demand, simply attractive the buyer may be sufficient. However, this may not always be the case. As a result, the second primary goal of a promotion campaign is to encourage the buyer to purchase the product over that similar products in the market. Now, persuasion can be done in a variety of ways, such as working on an emotional plan with the goal of presenting the product's benefits or matching the product to a strong client need. It also includes various subsidiary aims, like as image building for an organisation and encouraging the growth of a newly launched industry, in addition to the aforementioned goal. Personal and impersonal devices are used to promote banking services. Personal devices are completely subjective and vary from

person to person. ADVERTISING, PUBLICITY and SALES PROMOTION are example of impersonal promotion.

Promotional strategies of certain private sector commercial banks in Haridwar were studied in this study, In India, PCBs are continually focused on recognizing and anticipating consumer needs. They have already achieved great progress in the short time they have been around. Many of the banks in the country have been rated as top – tier by the internationally recognized by CAMEL grading system. They have already established an enviable position among their competitors as a result of their success in this fast-paced business. Commercial banks in the private sector offer a variety of financial products with varying features. To promote such products, they employ a variety of tactics.

The focus of the study will be on how private sector banks promotes their products.

REVIEW OF LITERATURE

A gap in the research into the most successful promotional tactics for the banking industry was revealed by our examination of the related literature. Prior researches have either concentrated on one or more promotional tools but not all of them, or have looked at promotional tools in other industries.



Michael et al; (2010) investigated clients switching behaviour in the Chinese retail banking sector. In the study the researchers looked at the elements that influence consumer switching behaviour. One example is the impact of a competing bank’s promotion efforts on a customer’s decision to switch bank.

In another research Barbara (1993) found that appealing the youth demographic is tough and that bank advertising and promotions had minimal impact on college student’s criteria for choosing services. (Blantson et al.2007)

Nancy and Robert (2000) investigated the advertisement of financial services in eight non- English-speaking nations. According to the researchers, there were some parallels and some significant disparities amongst the countries. The appeals to service excellence were the most widely employed in financial marketing in several nations.

Some scholars have suggested that financial services should be aggressively promoted in order to disseminate information forever. (Yavas et al.,1997)

Marketing, particularly promotional tools and plans are critical determinates for market success in this competitive world. Commercial banks and other financial institutions have been

driven to develop strategic marketing plans and employ research methodologies as a result of intense competition. (Kaynak and Whiteley 1999).

OBJECTIVE OF THE STUDY

The objective of the study is to study the effectiveness of the promotional tools of the banks from the customers perspective.

LIMITATIONS OF THE STUDY

The present study is limited to the customers of private banks of Haridwar district. Survey was conducted on 100 customers by random sampling. Time availability and hesitation of some consumers was the biggest limitation for the survey.

DATA ANALYSIS AND INTERPRETATION

The data for the current study were collected by administering a structured questionnaire to the bank customers which was divided into two parts. The first part contained the demographic details of the customers and the second part contained specific statements related to customers preferred medium of promotion. All the variables of the study were measured by using Likert scale, which ranges as 1= Highly disagree, 2= Disagree, 3= Neutral, 4=Agree, 5=Highly Agree.

SCORING RANGE OF THE LIKERT SCALE IN THE STUDY

RESPONSE	VALUE	RANGE
HIGHLY DISAGREE	1	1.00-1.80
DISAGREE	2	1.81-2.60
NEUTRAL	3	2.61-3.40
AGREE	4	3.41-4.20
HIGHLY AGREE	5	4.21-5.00

DEMOGRAPHIC DETAILS OF THE CUSTOMERS

TABLE 1: AGE AND GENDER

AGE GROUP	MALE	FEMALE
18-30	22	10
30-40	05	15
40-60	29	11
ABOVE 60	07	01
TOTAL=100	63	37

The above table shows the different age groups of the respondents. It can be seen that there are total 63 males and 37 females and 22 males are in 18-30 age group and 10 females are there in this group. In age group 30-40, there are 5 males

and 15 females and in age group 40-60, there are 29 males and 11 females. 07 males are above the age of 60 and 01 female is above 60 in age.

TABLE 2: EDUCATION AND MARITAL STATUS

EDUCATION	MALE		FEMALE	
	Married	Unmarried	Married	Unmarried
Highschool	04	01	01	00
Intermediate	08	04	10	00
Graduate	18	03	09	06
Postgraduate	08	00	02	05
Others	10	07	01	03
Total	48	15	23	14



Table 2 explains that out of the total 100 respondents, 48 males are married and 15 are unmarried while in females, 23 are married and 14 are unmarried. In married males, majority of

respondents are graduates. In married females, majority of the respondents are intermediate and graduate.

TABLE 3: PROFESSION

PROFESSION	MALE	FEMALE
GOVT. EMPLOYEE	05	07
PRIVATE EMPLOYEE	25	15
SELF-EMPLOYED	24	04
PROFESSIONAL	09	03
HOUSEWIFE	00	08
TOTAL	63	37

Table 3 shows the profession of the respondents. A total of 5 males and 7 females are employed in government sector. Majority of respondents in both male and female are employed

in private sector (25 males and 15 females). 24 males and 4 females are involved in their own business. 8 females are housewives while 9 males and 3 females are professionals.

SECTION 2: PREFERRED MEDIUM OF PROMOTION

A. ADVERTISEMENT ON TELEVISION

RESPONSES	WEIGHTAGE	NO. OF RESPONSES	W*R
Highly Disagree	1	03	03
Disagree	2	07	14
Neutral	3	22	66
Agree	4	64	256
Highly Agree	5	04	20
Total		100	359

The above table is illustrating the responses of the customers for Advertisement in television as preferred medium of promotion by their bank. 3 out of total 100 customers are highly disagreed with the above statement, 7 are disagree, 22 respondents are indifferent and the majority of 64 respondents are agree with the above statement.

By calculating weighted average of the total responses, we got 3.59, which lies within the range '3.41-4.20'. the result shows that most of the customers are agreed to the statement. Customers generally prefer television as a medium of getting information regarding banks policies.

B. NEWSPAPERS

RESPONSES	WEIGHTAGE	NO. OF RESPONSES	W*R
Highly Disagree	1	08	08
Disagree	2	05	10
Neutral	3	30	30
Agree	4	45	180
Highly Agree	5	12	60
Total		100	288

The above table is showing the responses of the customers for preferring newspaper as a medium of promotion. Out of total 100 responses, 8 are highly disagree and 30 are neutral towards the above statement. Majority of 45 responses are agreed with the statement.

By calculating weighted mean of the total responses, we got 2.88, which lies within the range "2.61-3.40". which states that the respondents are neutral towards the statement.

C. WEEKLY/ MONTHLY MAGAZINES

RESPONSES	WEIGHTAGE	NO. OF RESPONSES	W*R
Highly Disagree	1	13	13
Disagree	2	07	14
Neutral	3	42	126
Agree	4	23	92
Highly Agree	5	15	75
Total		100	320



The table illustrates the responses of the customers for weekly/monthly magazines preferred by them as a medium to be informed. Majority of 42 out of 100 customers are neutral towards the statement. While 13 are highly disagreed with and 15 are highly agreed with the same.

By calculating the weighted mean of the total responses, we got 3.20, which lies within the range “2.61-3.40” which states that the respondents are neutral towards this statement.

D.EXHIBITIONS

RESPONSES	WEIGHTAGE	NO. OF RESPONSES	W*R
Highly Disagree	1	18	18
Disagree	2	22	44
Neutral	3	30	90
Agree	4	18	72
Highly Agree	5	12	60
Total		100	284

The above table shows the responses for exhibitions as a preferred medium of promotion. Majority of 30 customers are neutral towards the statement. 22 customers are disagreed while 18 are agreed towards this.

By calculating weighted mean of the total responses, we got “2.84”, which lies within the range “2.61-3.40”, which shows that the respondents are neutral towards the above statement.

E. SALES PERSONS

RESPONSES	WEIGHTAGE	NO. OF RESPONSES	W*R
Highly Disagree	1	00	00
Disagree	2	02	04
Neutral	3	88	264
Agree	4	10	40
Highly Agree	5	00	00
Total			308

The table shows the responses for preferring sales persons as a medium to be informed. A majority of total 88 responses are neutral towards the same.

By calculating weighted mean of the total responses, we got 3.08, which falls within the range “2.61-3.40” and shows that the customers are neutral towards the same.

F. ADVERTISEMENT ON MOBILE

RESPONSES	WEIGHTAGE	NO. OF RESPONSES	W*R
Highly Disagree	1	00	00
Disagree	2	00	00
Neutral	3	20	60
Agree	4	08	32
Highly Agree	5	72	360
Total		100	452

The table shows the responses for advertisement on mobile as a preferred medium of promotion. Majority of 72 responses are highly agreed with the above statement. None of the respondents are disagreed or highly disagreed with this statement.

By calculating weighted mean, we got 4.52, which lies within the range “4.21-5.0” and shows that the customers are highly agreed with the above statement.

G. HOARDINGS

RESPONSES	WEIGHTAGE	NO. OF RESPONSES	W*R
Highly Disagree	1	00	00
Disagree	2	02	04
Neutral	3	72	216
Agree	4	12	48
Highly Agree	5	14	70
Total		100	338



The table shows the responses for hoardings as a preferred medium of promotion. Majority of 72 respondents are neutral towards it. None of the respondents are highly disagreed with the above statement.

By calculating weighted mean for the above, we got 3.38, which lies within the range “2.61-3.40” which shows that customers are neutral towards it.

H. FAMILY AND FRIENDS

RESPONSES	WEIGHTAGE	NO. OF RESPONSES	W*R
Highly Disagree	1	00	00
Disagree	2	08	16
Neutral	3	20	60
Agree	4	40	160
Highly Agree	5	32	160
Total		100	396

the table shows the responses for Family and Friends as a preferred medium of promotion. No one is highly disagreed with the statement. Majority of 40 customers are agreed with this and 32 customers are highly agreed with the statement while 20 customers are neutral towards it.

After calculating weighted average for the above response, we got 3.96, which lies within the range “3.41-4.20” which shows that customers are Agreed with the above statement.

I. TELEPHONY

RESPONSES	WEIGHTAGE	NO. OF RESPONSES	W*R
Highly Disagree	1	06	06
Disagree	2	12	24
Neutral	3	34	102
Agree	4	38	152
Highly Agree	5	10	50
Total		100	334

this table shows the responses for Telephony as a preferred medium of promotion by the customers. 34 out of 100 responses are neutral and 38 are agreed with this. 6 respondents are highly disagreed and 12 respondents are disagreed with it while 10 respondents are highly agreed with it.

After calculating the weighted mean of the above responses, we got 3.34, which lies within the range “2.61-3.40” and shows that the customers are neutral towards the same.

J. EMAILS

RESPONSES	WEIGHTAGE	NO. OF RESPONSES	W*R
Highly Disagree	1	03	03
Disagree	2	02	04
Neutral	3	28	84
Agree	4	05	20
Highly Agree	5	62	320
Total		100	431

the above table shows the responses of the customers for preferring Emails as a medium to be informed by. Only 2 of 100 customers are disagreed and 3 are highly disagreed with it. 28 customers are neutral and 5 are agreed with it while majority of 62 customers are highly agreed with it.

By calculating weighted average of the above we got 4.31, which lies within the range “4.21-5.00” which shows that customers are highly agreed with the same.

K. FACEBOOK /WHATSAPP

RESPONSES	WEIGHTAGE	NO. OF RESPONSES	W*R
Highly Disagree	1	00	00
Disagree	2	05	10
Neutral	3	15	45
Agree	4	08	32
Highly Agree	5	72	360
Total		100	447



Table shows the responses of the customers for Facebook /WhatsApp as a preferred medium of promotion. No customers are highly disagreed with this. 5 of 100 customers are disagreed while 15 of 100 customers are neutral for this. 15 customers are agreed to and majority of 72 customers are highly agreed with the same.

By calculating weighted mean for the above responses, we got 4.47, which lies within the range "4.21-5.00" which shows that the customers are highly agreed with the same and mostly prefer Facebook or WhatsApp as a medium to be informed.

CONCLUSION

As the study disclosed that most of the customers preferred Emails and Facebook or WhatsApp as a medium to be informed through. In this fast-paced time, people don't have enough time to read the newspaper thoroughly or to watch television for so long. This is the era of digitalisation. According to a survey, at the start of 2023, there were 692.0 million internet users in India and 467.0 million social media users were there in January 2023. There was an increase of 200 percent internet subscriptions in rural areas as well as 158 percent increase in urban areas. A large proportion of India's population is using smart phones and also prefer to get informed in a smart way i.e. "More Information in Less Time".

As the number of social media users are increasing day by day, it is expected to get more on social media platforms. It is concluded that banks must use social media like Facebook pages, Emails and WhatsApp messaging as a tool for their promotional strategies.

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PHYSICS EDUCATION TECHNOLOGY (PhET) INTERACTIVE SIMULATIONS AS TEACHING AID IN ENHANCING STUDENTS' PERFORMANCE IN PHYSICS

Melvin C. Eleo¹, Ylcy B. Manguilimotan²

¹Master of Arts in Education major in Teaching Science, Graduate School Education Department, Saint Mary's College of Tagum, Inc., Tagum City, Philippines

²Graduate School Professor, Graduate School Education Department, Saint Mary's College of Tagum, Inc., Tagum City, Philippines

Article DOI: <https://doi.org/10.36713/epra15991>

DOI No: 10.36713/epra15991

ABSTRACT

This study aimed to determine the effectiveness of Physics Education Technology (PhET) interactive simulations in enhancing students' performance in Physics. It is a quantitative study involving pretest-posttest quasi-experimental research. The respondents for this study were 60 Grade 11 senior high school students, specifically from two sections in a public secondary school in the Division of Davao de Oro. They were categorized into two groups: the experimental group and the control group. The pretest and posttest questionnaire, derived from the Grade 11 Physical Science module, underwent pilot testing to ensure its validity and reliability and was utilized as the instrument. The mean, mean gain score, T-test for correlated mean, and T-test for uncorrelated mean were employed as the statistical treatments for this study. The results revealed that before the intervention, the student's performance in both groups was at the same level. However, during the post-test, the control and experimental groups improved their Physics performance, albeit at different levels. A significant difference was observed between the mean gain scores of the two groups. This suggests that the intervention, Physics Education Technology (PhET) interactive simulation, is more effective compared to the conventional method of teaching. The researcher recommends that students play an active role in the learning process. Teachers should incorporate PhET interactive simulations into their classes, and administrators should provide relevant training and workshops on the proper use of PhET interactive simulations. Future researchers are encouraged to conduct studies on other areas related to PhET interactive simulations.

KEYWORDS: Education, students' performance, Physics Education Technology (PhET), quasi-experimental, Pretest-Posttest design, Grade 11 students

I. INTRODUCTION

Physics, a theoretical science, requires practical experiences and models to understand concepts. Instructors should incorporate inquiry, discovery, demonstration, simulation, practical work, lab-based activities, and other experiences. Physics is less popular among students due to perceived difficulty and complexity (Yunzal & Casinillo, 2020).

Physics had the highest percentage of failed Senior High School exam students in Kupang City, Indonesia, due to heavy emphasis on formula memorizing without practical laboratory work (Nggadas & Ariswan, 2019). A study by Najib et al. (2022) found a lack of understanding of physics concepts in secondary schools in Peninsular Malaysia's Northern State. Teacher-centered training and inadequate laboratory facilities, reagents, and equipment hinder students' comprehension of physics topics. Qualified technicians and teachers also hinder exposure to laboratory activities (Zengele & Alemayehu, 2020).

The National Institute for Science and Mathematics Education Development at the University of the Philippines (UP-

NISMED) and the Science Education Institute, Department of Science and Technology (SEI-DOST) in the Philippines have identified a lack of learner-centered classrooms and instructional strategies as contributing factors to students' subpar academic performance in physics. Insufficient laboratory equipment and a teacher-centered approach are also identified as factors (Rabino et al., 2021). Jorales (2020) also asserted that the lecture method is often used in physics classes and students are rarely given engaging and challenging homework.

The researcher found that in Laak North District secondary schools, Grade 11 students' proficiency in Physics was satisfactory, with a mean percentage score of 78.88%. Most students' grades fell between 75 and 80, indicating a lack of laboratory tools and equipment, leading to teacher-centered tactics, and limited experiential learning through laboratory activities.

To deal with several of the above concerns, in this study, the researcher designed and assessed inquiry activities that involved students in the exploration of physics ideas using Physics Education Technology (PhET) simulations. PhET is a



simulation software that is an online collection of interactive simulations and educational materials used to teach and learn physics and other subjects. It motivates students through interactive exploration, creates game-like challenges, interfaces abstract physics with mathematical models, and uses numerically accurate physical representations (Bello, 2018). It provided an open learning environment, allowing students to test hypotheses, isolate and manipulate parameters, and use visual aids like pictures, graphs, and numerical figures. This approach helps learners overcome difficulties in science experiments due to technical obstacles, lack of materials, or rapid subject recognition (Garcia, 2021).

The researcher underscores the need to investigate PhET simulations' effectiveness in enhancing students' physics learning. The study aims to provide teachers with a new perspective on teaching science, focusing on the value of simulations in understanding abstract concepts. It also addresses the lack of adequate laboratory equipment in schools.

II. OBJECTIVES

The objective of this study was to determine whether interactive simulations created using Physics Education Technology (PhET) as a teaching tool may improve students' performance in physics.

Specifically, it aims to answer the following questions:

1. What is the level of student performance in the control and experimental groups in terms of their pre-test scores?
2. What is the level of student performance in the control and experimental group in terms of their post-test scores?
3. Is there a significant difference in the pre-test and post-test scores of the control and experimental groups?
4. Is there a significant difference in the mean gain score of the control group and experimental group?

III. METHODOLOGY

This is quantitative research that is quasi-experimental in nature. Respondents of the study were the Grade 11 senior high

school students for School Year 2023-2024 who are pursuing their education in one of the secondary educational institutions in the municipality of Laak, Davao de Oro, Philippines. The researcher selected two randomly ordered sections (control group & experimental group), each with 30 students. To maintain the heterogeneity of the groups, a T-test for uncorrelated mean was conducted during the pre-experimentation phase. The results yielded no significant difference suggesting that randomization employed in assigning participants to the control and experimental groups was effective in creating comparable groups at the baseline.

The research instrument that was utilized in this study was a researcher-made test which consisted of 40-item multiple-choice questions produced by the researcher. Before being employed in the study, it was first subjected to content validation and pilot testing. The Classical Item and Test Analysis Spreadsheet was also used in measuring the reliability of the test. This instrument was conducted through a pretest and post-test to the control and experimental groups to gather data for this study.

Physics Education Technology (PhET) simulation was the intervention utilized by the experimental group participating in this study. During the implementation of the intervention, the class convened for four hours weekly over a month, utilizing the computer laboratory as the designated classroom for the participants' physics instruction. Each student was equipped with a tablet computer on which the PhET program was installed. On the other hand, within the instructional framework of the control group, the facilitator refrained from integrating PhET simulations as a pedagogical tool when teaching designated physics topics. Instead, the instructional medium entailed the utilization of the Self-Learning Module (SLM), alongside conventional teaching methodologies. The class convened four times a week for over a month.

The Mean, Mean Gain Score, T-test for correlated mean, and T-test for uncorrelated mean are the statistical tools that were used in analyzing and interpreting the data result of this study.

IV. RESULTS

Table 1. Level of Students' Performance in the Control and Experimental Group in Terms of Pre-Test Scores

Groups	Mean Score	Mean Percentage Score	Pre-Test	
			SD	Descriptive Equivalent
Control	11.50	28.75	7.71	Low
Experimental	11.17	27.93	6.16	Low



Table 2. Level of Students' Performance in the Control and Experimental Group in Terms of Post-Test Scores

Groups	Mean Score	Mean Percentage Score	Post-Test	
			SD	Descriptive Equivalent
Control	20.60	51.50	7.47	Moderate
Experimental	25.20	63.00	10.82	High

Table 3. Significance of Difference in the Pre-Test and Post-Test Scores of the Control and Experimental Groups

Groups	Pre-Test Mean Percentage Score	Post-Test Mean Percentage Score	Mean Difference	t-value	p-value
Control	28.75	51.50	-22.75	16.688	0.000
Experimental	27.92	63.00	-35.08	19.939	0.000

Table 4. Significance of the Difference in the Mean Gain Scores of the Control and Experimental Groups

Groups	Mean Gain Score	SD	Difference	t-value	p-value
Control	22.75	7.47	-12.33	-5.541	0.000
Experimental	35.08	9.64			

V. DISCUSSION

Table 1 found no significant difference in pre-test scores between the control and experimental groups, suggesting that randomization effectively created comparable groups at baseline, based on the preliminary analysis of pretest scores using a T-test for uncorrelated samples. The scores and standard deviations indicate a consistent baseline performance with low pretest performance, indicating reliability. The observed standard deviations show variability within each group, clustering around mean scores. These initial metrics serve as a reference point for assessing performance improvements and differences throughout the study.

The student's prior knowledge of physics and the environment in which they were exposed can be ascribed to the results of their pretest. Another fact to this is that learning competencies in Physics have not been introduced to the students (Migalang & Azuelo, 2022). The data of the current study mirrored those of Ndiokubwayo, et al. (2019), who found that there was a deficiency in the students' conceptual understanding of physics. This was further emphasized by Asgari, et.al (2018), who was quoted by Uwambajimana and Minani (2023), who claimed that while most texts describe these ideas in abstract terms, learners typically do not have a thorough knowledge of these concepts.

An overview of the post-test performance levels of students in the control and experimental groups is shown in Table 2. The mean scores and standard deviations show different levels of post-test performance between the control and experimental groups. The control group showed moderate achievement, while the experimental group showed higher achievement and greater variability. The standard deviations indicate varying responses within each group, highlighting factors influencing

improvement. The post-test results showed that the mean score obtained by students in the researcher-made test after the intervention was statistically different for the two groups. The post-test score was higher than that of the pre-test. These demonstrate how the use of PhET simulation in teaching and learning affects the students' performance in Physics.

Similarly, the results were like that of Uwambajimana and Minani (2023) stressed out Simulations enhance student discovery by making abstract concepts concrete and providing quick feedback, allowing learners to change virtual world settings and develop fresh understanding. Nyirahabimana et al. (2022) showed that when multimedia, including PhET simulation, was used in teaching, students were more motivated. The ability of computer simulations to help students envision, think about, and explain abstract concepts was cited as the reason for the experimental group's performance (Chumba et al., 2020). The study's findings are also consistent with Susilawati et al. (2022) assertion that by presenting conceptual and visual model animations, PhET simulation can help students better understand the physics subjects they are studying. Furthermore, PhET includes experimental and theoretical simulations that actively involve users. PhET media can be used to teach Physics since users can change experiment-related activities (Ginting et al., 2020).

Table 3 showed a significant increase from pre-test to post-test percentage scores of the control and experimental groups. This significant difference indicates a statistically significant improvement and rejects the null hypothesis of no significant difference between the pretest and post-test scores of the control and experimental groups. However, the results highlighted the significant difference in the pretest and post-test scores of the experimental group. This indicates that the



observed improvements were not due to chance variations but rather to the intervention's impact. The experimental group demonstrated a more pronounced positive effect compared to the control group, highlighting the intervention's effectiveness in enhancing students' academic performance.

The noteworthy outcome is consistent with Nyirahabimana et al. (2022) findings, which showed that students were more motivated and engaged in meaningful learning when multimedia, including PhET simulation, was employed in the classroom. Furthermore, according to Ersoy and Dilber (2014), who were quoted by Lukita and Jayanagara (2023), simulations increased the scope of student discovery by giving prompt feedback on the experience and by giving the abstract greater concreteness. Additionally, the results showed that students could remember the lessons they had learned when a PhET simulation was used. Students who used a PhET simulation were more excited and engaged in their studies (Rustana et al., 2020).

Table 4 indicates a significant difference in performance between the two groups. A T-test for uncorrelated samples was conducted to compare mean gain scores between the control and experimental groups. A t-value of 5.541 indicates a significant difference in percentage scores between the two groups, indicating lower mean gain scores in the Control group. The p-value for both groups is 0.000, rejecting the null hypothesis of no significant difference. This suggests that the observed difference is statistically significant, and the experimental group performed better in the post-test.

Masita et al. (2020) found that PhET interactive simulations effectively engage students, encouraging active participation in questions, arguments, inferences, and decision-making, ultimately preparing them for higher-order thinking by the end of the course. Nkemakolam et al. (2018) highlighted the benefits of PhET interactive simulations over traditional lecture formats, highlighting their ability to reduce abstract concepts and enhance students' achievement, particularly in Physics, by allowing students to see, investigate, and create scientific explanations.

VI. CONCLUSIONS

Based on the findings of this study, the following conclusions are drawn:

1. Both the control and experimental groups' pretest results for Physics show low performance from the students. Before the experiment, all groups performed at the same level.
2. According to the post-test result, the experimental group showed high academic improvement, while the control group showed only moderate improvement.
3. The results of the pre-test show that there is no significant difference between the experimental and control groups' performance levels in physics, whereas the results of the post-test show that there is significant variation between the two groups' performance levels.
4. The result demonstrates that there is a significant difference between the experimental and control groups' levels of student performance in physics.

Consequently, the researcher's usage of an interactive simulation based on Physics Education Technology (PhET) as a teaching strategy for the experimental group proved to be more successful than the traditional approach of instruction for the control group.

VII. RECOMMENDATIONS

Based on the findings, analysis, and conclusions drawn in this study, the following commendations are summarized:

1. Students should actively engage by using PhET simulations in manipulating variables, conducting virtual experiments, and taking an active role in the learning process to accomplish better academically and become more adept at solving scientific problems.
2. To increase student performance, science teachers should utilize lesson plans that integrate PhET interactive simulations in their lessons on abstract ideas in physics. This will engage and inspire students to gain a deeper conceptual knowledge of the material and improve their performance in physics.
3. School administrators should support their teachers in using PhET simulation since it can remove some concepts' abstraction by giving them greater concreteness, which makes the notion easier for pupils to understand. School administrators should provide funding sources for the procurement of computer packages for the utilization of PhET interactive simulation. To capacitate teachers to become more proficient in teaching science subjects, including Physics, Learning Action Cells (LAC) should be organized on the use of PhET interactive simulation. This will enable the teachers to use this technology and improve student performance in the classroom.
4. The study's findings could serve as a springboard for future investigations by scientists and science educators into the ways that technology—specifically computer simulations—influences other academic subjects, learning styles, gender, and a host of other factors.

IX. COMPLIANCE WITH ETHICAL STANDARDS

This research study was reviewed for research ethics compliance by the Saint Mary's College of Tagum, Inc. - Research Ethics Committee (SMCTI-REC) to guarantee the privacy, social security, and well-being of human research participants and to maintain the integrity of the research.

The respondent's well-being was safeguarded well during the entire duration of the study. The participation of the respondents was completely voluntary and have the right to withdraw at any time without providing any reason during the conduct of this study. Parental Informed Consent and Informed Assent were sought from the parents and respondents, respectively before this research started. The privacy of the respondents is of paramount reputation; thus, complete anonymity and confidentiality were treated with utmost importance through discrete coding. No individual identities were used in any reports, presentations, or publications resulting from the research study.



Furthermore, the researcher declares no conflict of interest exists in the conduct of the study. The researcher adheres to the originality of this research and plagiarism was strictly avoided. There was no bias in the interpretation of the findings and results were used purely for research.

X. ACKNOWLEDGEMENT

The researcher would like to acknowledge the support and gratitude of all the people who made significant contributions to this study.

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METHODOLOGY OF IMPROVING NONVERBAL COMMUNICATIVE COMPETENCE OF PHYSICAL EDUCATION STUDENTS

Sarsenbaev Dauran Jangabay Uli¹, Urazimbetova Mardjna Sultamuratovna²

¹Trainee-Teacher at Nukus Branch of the Uzbekistan State University of Physical Education and Sports
Independent Researcher at Karakalpakstan branch of the Research Institute of Pedagogical Sciences of Uzbekistan
named after Qori Niyoziy,

²Trainee-teacher of the Sports Department at at Nukus Branch of the Uzbekistan State University of Physical
Education and Sports, Nukus, Uzbekistan, Karakalpakstan

ANNOTATION

This article examines the strategies for enhancing the nonverbal communicative skills of students studying physical education. The paper describes various methodologies aimed at improving body language, gestures, facial expressions, and other nonverbal cues crucial for effective communication in physical education settings. Drawing upon theoretical frameworks and practical techniques the study offers insights into how educators can integrate these methodologies into their teaching practices to foster better interpersonal interactions, enhance teaching effectiveness, and promote overall student engagement and learning outcomes in the realm of physical education.

KEY WORDS: strategies, nonverbal, communicative, skills, students, methods.

INTRODUCTION

Improving the nonverbal communicative competence of physical education students is crucial for several reasons:

Enhanced Teaching Effectiveness: Nonverbal communication plays a significant role in the teaching and learning process. For physical education instructors, the ability to effectively convey instructions, demonstrate movements, and provide feedback through nonverbal cues can greatly enhance the learning experience for students.

Facilitating Understanding: Physical activities often involve complex movements and techniques that may be difficult to explain solely through verbal instructions. Nonverbal communication, including gestures, facial expressions, and body language, can help clarify instructions and facilitate understanding among students, especially those who may struggle with verbal explanations.

Building Rapport and Engagement: Nonverbal cues are instrumental in building rapport and fostering a positive learning environment. By effectively using nonverbal communication, instructors can establish trust, demonstrate enthusiasm, and create a sense of connection with their students, thereby increasing engagement and motivation.

Improving Feedback and Correction: Nonverbal cues can be invaluable in providing feedback and correction during physical activities. By observing students' body language and movements, instructors can identify areas for improvement and provide timely feedback without interrupting the flow of the activity.

Promoting Inclusivity and Accessibility: Nonverbal communication can be particularly beneficial in inclusive learning environments where students may have diverse communication needs or language barriers. Utilizing a range of nonverbal cues ensures that all students can effectively participate and understand instruction regardless of their verbal communication abilities.

Preparing for Real-World Interaction: Proficiency in nonverbal communication is essential for success in various real-world settings beyond the classroom, including sports coaching, physical therapy, and recreational leadership roles. By developing nonverbal communicative competence early on, physical education students are better equipped for future professional endeavors.

Enhancing Social and Emotional Skills: Nonverbal communication skills are closely tied to social and emotional intelligence. By honing their ability to interpret and express nonverbal cues, students can improve their interpersonal skills, empathy, and self-awareness, which are valuable assets in both personal and professional life.

Thus, improving the nonverbal communicative competence of physical education students is essential for effective teaching and learning, fostering positive relationships, and preparing students for success in diverse real-world contexts. By prioritizing the development of these skills, educators can empower students to become confident communicators and active participants in physical activities.



LITERATURE REVIEW

Nonverbal communication plays a pivotal role in conveying messages, especially in contexts where verbal communication may be limited or ambiguous. In the realm of physical education, where movement and body language are integral components of interaction, enhancing nonverbal communicative competence is essential for effective teaching and learning experiences. This literature review explores various methodologies aimed at improving the nonverbal communicative competence of physical education students, drawing insights from research in education, psychology, and communication studies.

Understanding Nonverbal Communication in Education.

Nonverbal communication encompasses gestures, facial expressions, body posture, and other nonverbal cues that convey meaning during interpersonal interactions. In the educational context, nonverbal communication plays a crucial role in classroom management, student engagement, and teacher-student relationships [4]. Research suggests that nonverbal cues can significantly impact teaching effectiveness and student learning outcomes [6].

Importance of Nonverbal Communication in Physical Education.

In physical education settings, nonverbal communication takes on added significance due to the emphasis on movement, spatial awareness, and physical demonstration. Effective nonverbal communication can enhance student comprehension, motivation, and skill acquisition [3]. Moreover, nonverbal cues such as body language and facial expressions can influence perceptions of competence and confidence among both teachers and students [7].

Methodologies for Improving Nonverbal Communicative Competence.

a. **Modeling and Demonstration:** One approach to improving nonverbal communicative competence involves modeling and demonstration by instructors. By observing skilled practitioners and mimicking their movements, students can enhance their own nonverbal communication skills [5].

b. **Feedback and Reflection:** Providing students with feedback on their nonverbal behaviors and encouraging self-reflection can promote awareness and improvement. Video analysis and peer feedback sessions are effective strategies for facilitating this process [8].

c. **Experiential Learning:** Engaging students in experiential activities, such as role-playing exercises and group discussions, can deepen their understanding of nonverbal communication principles and their application in real-world scenarios [1].

d. **Integration of Technology:** Incorporating technology-based tools, such as motion capture systems and virtual reality simulations, can provide students with immersive learning experiences that enhance their nonverbal communicative competence [2].

Thus, improving the nonverbal communicative competence of physical education students is essential for fostering effective communication, enhancing learning experiences, and promoting positive interpersonal relationships. By

implementing methodologies such as modeling, feedback, experiential learning, and technology integration, educators can empower students to effectively convey messages through nonverbal cues, thereby enriching their educational journey and beyond.

METHODOLOGY

In the study, thematic analysis employed to identify patterns, themes, and categories in qualitative data obtained from observations, interviews, statistical techniques such as descriptive statistics, correlations, and inferential tests to analyze quantitative data from surveys or structured observations.

In the following, here are some practical recommendations for enhancing nonverbal communication skills in physical education settings:

Modeling and Demonstration: Physical education instructors should demonstrate movements and techniques themselves, paying attention to their own nonverbal cues such as posture, gestures, and facial expressions. This provides students with a visual reference for proper form and technique while simultaneously reinforcing the importance of nonverbal communication.

Video Analysis: Incorporate video analysis sessions where students can review their own and others' performances. Encourage students to pay attention to nonverbal cues such as body alignment, facial expressions, and hand gestures, and discuss how these factors contribute to effective communication and performance.

Role-Playing and Simulation: Engage students in role-playing exercises where they take on the roles of both instructor and student. This allows them to practice using nonverbal cues to convey instructions, provide feedback, and demonstrate movements, thereby enhancing their communication skills in a hands-on and interactive manner.

Feedback and Reflection: Provide regular feedback to students on their nonverbal communication skills, highlighting strengths and areas for improvement. Encourage students to reflect on their own communication practices and identify strategies for enhancing their nonverbal cues, such as maintaining eye contact, using open body language, and adjusting their tone of voice.

Interactive Games and Activities: Incorporate interactive games and activities that require students to communicate nonverbally, such as team-building exercises, partner drills, and improvisational movement tasks. These activities not only help students develop their nonverbal communication skills but also promote collaboration, creativity and problem-solving.

Cross-Cultural Awareness: Emphasize the importance of cross-cultural awareness in nonverbal communication, as gestures and body language may vary across different cultures. Encourage students to consider cultural differences and adapt their nonverbal cues accordingly to ensure effective communication and respect for diversity.



Self-Reflection and Self-Practice: Encourage students to engage in self-reflection and self-practice outside of class to further develop their nonverbal communication skills. This could include practicing relaxation techniques to improve body language, recording themselves giving instructions or demonstrations, and seeking feedback from peers or instructors.

By implementing these practical recommendations, physical education instructors can help students enhance their nonverbal communication skills in a structured and supportive learning environment, ultimately empowering them to communicate effectively and confidently in various contexts.

DISCUSSION

Nonverbal communication plays a crucial role in various aspects of life, including education. In the field of physical education, effective nonverbal communication skills are essential for conveying instructions, providing feedback, and fostering positive interactions among students. This discussion aims to explore methodologies for enhancing the nonverbal communicative competence of physical education students.

Understanding Nonverbal Communication: Before delving into methodologies, it's imperative to understand the significance of nonverbal communication. Nonverbal cues such as body language, facial expressions, gestures, and posture can convey emotions, intentions, and attitudes, often complementing or contradicting verbal messages [10]. In physical education settings, teachers' nonverbal behaviors significantly influence students' engagement, motivation, and learning outcomes [13].

Methodologies for Improving Nonverbal Communicative Competence

Modeling and Imitation: Encouraging students to observe and imitate effective nonverbal behaviors can be a powerful learning tool [11]. Teachers can demonstrate appropriate body language, gestures, and facial expressions during instruction and physical activities, providing students with clear examples to emulate.

Feedback and Reflection: Providing constructive feedback on students' nonverbal communication skills and encouraging self-reflection can facilitate improvement [14]. Teachers can offer specific observations and suggestions for improvement, promoting awareness and self-correction among students.

Role-Playing and Simulation: Engaging students in role-playing exercises and simulations allows them to practice nonverbal communication in realistic scenarios [15]. By assuming different roles and contexts, students can experiment with various nonverbal cues and receive feedback on their effectiveness.

Interactive Activities: Incorporating interactive activities such as group discussions, team building exercises, and cooperative games can enhance students' nonverbal communication skills [12]. These activities encourage collaboration, empathy, and understanding of nonverbal cues within a social context.

Technology-Assisted Learning: Leveraging technology tools such as video analysis software can provide students with visual feedback on their nonverbal behaviors [9]. By recording and reviewing their performances, students can identify areas for improvement and track their progress over time.

Enhancing the nonverbal communicative competence of physical education students requires a multifaceted approach encompassing modeling, feedback, practice, and technology integration. By implementing these methodologies, educators can empower students to effectively convey messages, build rapport, and foster positive interactions in physical education settings.

CONCLUSION

To sum up, enhancing the nonverbal communicative competence of physical education students is imperative for their holistic development. Through a comprehensive methodology encompassing techniques such as body language interpretation, spatial awareness exercises, and reflective practices, students can significantly improve their ability to convey and interpret nonverbal cues effectively. By fostering a deeper understanding of nonverbal communication, educators empower students to excel not only in their academic pursuits but also in their interpersonal relationships and future professional endeavors.

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EMPOWERING RURAL WOMEN: A CLOSER LOOK AT THE IMPACT OF MICROFINANCE SERVICES

Riya Banerjee

Student of MBA, MMIM, Maharishi Markandeshwar Deemed to be University Mullana, Ambala, Haryana, India

ABSTRACT

This article explores the transformative impact of microfinance services on rural women, focusing on their economic and social empowerment. Microfinance, characterized by small-scale financial services, plays a pivotal role in addressing the unique challenges faced by rural women, often marginalized and excluded from traditional banking systems. The discussion encompasses the economic empowerment achieved through entrepreneurship, asset accumulation, and improved financial stability. Social empowerment is examined through education, skill development, enhanced health and well-being, increased agency, and community leadership. Despite the profound positive effects, challenges such as over-indebtedness and socio-cultural barriers persist. The abstract emphasizes the need for a comprehensive understanding of the multifaceted impact of microfinance, advocating for its continued refinement and expansion to empower rural women globally.

KEYWORDS: Microfinance, Women, development, services)

INTRODUCTION

In the global effort to alleviate poverty and empower marginalized communities, microfinance services have emerged as a powerful tool, particularly in rural areas. Among the beneficiaries of microfinance, rural women stand out as a significant demographic, experiencing transformative changes in their lives. This article provides an overview of the impact of microfinance services on the empowerment of rural women.

Microfinance and Rural Women

Microfinance involves the provision of small-scale financial services, including loans, savings, and insurance, to individuals who typically lack access to traditional banking services. Rural women, often marginalized and financially excluded, constitute a substantial portion of microfinance clients worldwide. The tailored financial products and services offered by microfinance institutions (MFIs) empower these women by addressing their specific needs and challenges.

Economic Empowerment

1. Entrepreneurship and Income Generation

- Microfinance empowers rural women by providing them with the financial means to start or expand small businesses. This may include activities such as farming, handicrafts, or retail ventures.

- Access to microloans enables women to invest in income-generating projects, contributing not only to their households' economic well-being but also to the overall economic development of their communities.

2. Asset Accumulation

- Microfinance services assist women in accumulating assets by offering financial support for the purchase of livestock, agricultural equipment, or other productive assets.

- The ownership of assets enhances the economic resilience of rural women and fosters a sense of financial independence.

Social Empowerment

1. Education and Skill Development

- Microfinance programs often incorporate elements of education and skill development. Rural women receive training in financial literacy, business management, and other relevant skills, empowering them with the knowledge needed to make informed decisions.

- Enhanced skills contribute to the women's overall confidence and their ability to navigate economic challenges.

2. Health and Well-being

- Improved financial stability enables rural women to invest in better healthcare for themselves and their families. This includes access to medical services, nutrition, and sanitation facilities.

- Microfinance indirectly contributes to the overall well-being of rural communities by breaking the cycle of poverty-related health challenges.

Empowerment in Decision-Making

1. Increased Agency and Participation:

- As women become financially self-sufficient through microfinance, their agency in decision-making processes within their households and communities increases.

- Financial independence often translates into a more active role in family decisions, such as children's education, healthcare, and overall household management.

2. Community Leadership

- Empowered rural women are more likely to engage in community leadership roles. Microfinance not only provides economic resources but also fosters a sense of community and collaboration.



- Women who benefit from microfinance programs often become leaders, driving positive changes in their communities and advocating for the well-being of others.

Challenges and Opportunities

While the impact of microfinance on rural women's empowerment is profound, challenges exist, including issues related to over-indebtedness, inadequate financial education, and socio-cultural barriers. It is crucial for microfinance institutions and policymakers to address these challenges and explore opportunities for further improvement.

CONCLUSION

Microfinance services have proven to be a potent force in transforming the lives of rural women, offering them economic independence, social empowerment, and a voice in decision-making processes. As these women continue to break barriers and contribute to the sustainable development of their communities, the significance of microfinance in fostering gender equality and poverty alleviation becomes increasingly evident. By acknowledging the transformative potential of microfinance, stakeholders can work collaboratively to refine and expand these initiatives, ensuring a more inclusive and empowered future for rural women around the world.

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THE USER INTERFACE AND USER EXPERIENCE DILEMMA IN DIGITAL PAYMENTS: A CUSTOMER-FOCUSED ANALYSIS

Ramanatha A¹, Mallika S¹

Department of Commerce and Business Administration, Kukke Subrahmanyeshwara College, Subrahmanya, Karnataka

ABSTRACT

This article examines the significant difficulties people encounter while using digital payments and how these difficulties may affect user interfaces and overall user experiences. Given the growing significance of digital payments in contemporary financial transactions, it is critical to comprehend end-user viewpoints and pinpoint opportunities for procedure enhancements. This paper analyzes user difficulties using a customer-focused approach, talks about how bad user experiences affect adoption rates, and suggests ways to close the gap between user expectations and digital payment systems.

KEY WORD: user interface (UI), user experience (UX), digital payments, cybersecurity, Mobile ,Wallets Customer, online , Payments, Biometrics, channels, phone, SMS, email. The integration of the Internet of Things (IoT)

INTRODUCTION

In the fields of technology and finance, the conflict between user interface (UI) and user experience (UX) in digital payments is a crucial problem. This conundrum results from the requirement to strike a compromise between guaranteeing clients a flawless and satisfying experience and the security and simplicity of digital payment solutions.

An Overview

- **Rise of Digital Payments:** The COVID-19 pandemic has accelerated the rise of digital payments, making them a necessity for everyday transactions, enhancing convenience and ease of use.
- **Significance of UI and UX:** UI and UX are crucial in determining a client's initial and ongoing use of a digital payment platform, as they focus on the layout and design of the payment interface.
- **Security Concerns:** Digital payments face increased fraud and cybersecurity risks, causing consumers to worry about transaction security and financial information. Payment platforms must offer robust security features to boost user confidence..
- **Competitive sector:** Competitive sector: There are many companies fighting for consumers' attention in the fiercely competitive digital payment sector. To keep ahead of the competition, businesses must constantly innovate and improve their UI/UX.

Purpose

This customer-focused study aims to understand and address the challenges and opportunities customers face when using digital payment services, focusing on the User Interface and UX.

- **Identify Pain Points:** Identifying pain points in digital payment interfaces, such as navigational issues,

transaction mistakes, security issues, and usability issues, is crucial for effective user experience.

- **Measure User Satisfaction:** Measure user satisfaction by gathering consumer input, conducting reviews, and conducting surveys to gauge overall satisfaction with digital payment platforms and services.
- **Examine User Behavior:** The study aims to understand customer behavior and digital payment preferences by analyzing adoption rates and factors influencing their choice of payment systems.
- **Examine Security Concerns:** Investigate potential security concerns, such as fraud, identity theft, or data breaches, that may impact clients' acceptance and confidence in digital payment systems.
- **Examine Accessibility:** Determine how usable digital payment systems are for those with impairments. Make sure that a wide range of customers can utilize the UI and UX.
- **Examine Adoption Barriers:** The study aims to identify the barriers that prevent certain users from adopting digital payments, such as technological difficulties, mistrust, and limited access to appropriate devices or internet connectivity.
- **User-Centered Design:** The goal is to enhance the user experience (UX) and effectiveness of digital payment solutions to make them more user-friendly and enjoyable for clients.
- **Benchmarking:** The benchmarking process involves comparing online payment systems to industry norms and identifying areas for improvement in UI/UX design principles.

The Development of Online Payments

The User Interface (UI) and User Experience (UX) in digital payments significantly impact users' interactions with various



payment methods and services, requiring a customer-focused examination of their unique opportunities and challenges.

- **Digital wallets:** Digital wallets should have a clear, simple UI for easy payment method management and customization, and a smooth user experience (UX) with biometric authentication for enhanced security, similar to face or fingerprint recognition.
- **Banking Online:** Online banking should have a user-friendly interface (UI) with quick access to payment options, transaction histories, account balances, fund transfers, and bill payments, and a simplified UX with push notifications and real-time updates.
- **Contactless Transactions:** Contactless transactions require minimal interaction and a straightforward UI, with clear notifications, easy cancellation policies, and transparent pricing for a satisfying user experience.
- **Payments using Peer-to-Peer (P2P):**
- P2P payment apps should provide a user-friendly interface, ensuring seamless transactions, security, and real-time confirmation for friends and family.
- **Payments Using Cryptocurrency:** Crypto wallets should have an easy-to-use, safe UI with tools for managing cryptocurrencies, transaction histories, and fees adjustment, while improving UX with concise explanations and simple conversions.
- **Subscription Plans and In-App Acquisitions:** The user interface (UI) and user experience (UX) are crucial for applications relying on subscription plans and in-app acquisitions, ensuring a user-friendly experience.
- **QR Code Transactions:** QR code transactions require a user-friendly interface and UX, ensuring quickness, precision, and visibility of transaction information and confirmation.
- **Payment Services for Bills:** Bill payment systems should provide an intuitive UI for managing billers, scheduling payments, and examining payment history, while also offering recurring payments, payment tracking, and clear deadlines.

Effective UI/UX design in digital payments should prioritize transaction security, charge transparency, and clear terms, with constant user input and usability testing crucial for refining the user experience.

User Difficulties with Digital Payments Security Issues

Digital payments are gaining popularity due to their speed and ease, but they also pose security risks that both customers and companies should be aware of.

- **Fraudulent Transactions:** Cybercriminals can easily obtain payment details and conduct fraudulent transactions without your consent, posing a significant concern.
- **Data Breach:** Businesses processing digital payments may experience data breaches, which can expose sensitive customer information such as names, credit card numbers, and private information.
- **Identity Theft:** Cybercriminals can use stolen personal information to commit identity theft, opening

new credit accounts and conducting fraudulent activities in your name.

- **Viruses and Malware:** Your computer or mobile device may become infected with malicious software, jeopardizing the security of your online banking details.
- **Insecure Networks:** If you use public Wi-Fi without taking the necessary security precautions, hackers may be able to access your credit card information.

Take into account the following recommended actions to safeguard your company and yourself from these security risks:

utilize strong, one-of-a-kind passwords, multi-factor authentication, keep an eye out for fraudulent transactions, utilize secure payment processors, and use caution when sharing personal or financial information online in order to protect your online accounts.

User Challenges in Digital Payments: Users frequently face problems with digital payments due to their complexity and uncertainty, which can lead to confusion and uncertainty.

The abundance of payment options, including bank transfers, digital wallets, credit cards, debit cards, and crypto currency, can overwhelm users. The confusing user interfaces can make it difficult to navigate these platforms. Additionally, unclear fees and charges can lead to unexpected expenses and frustration for users. Users may struggle with complex security procedures and authentication requirements, making it difficult to comply with password regulations. International transactions can be complicated due to added costs and currency conversions. Payment processing times can also be unpredictable, causing uncertainty and anxiety.

Users may face technical issues, confusion, lack of standardization, privacy concerns, and changing regulations when using digital payment systems. These issues can make debugging difficult, and users may struggle to understand the procedures and terminology. Privacy concerns may arise from the sharing or usage of user data.

User Challenges Inconsistency in Digital Payments

- Digital payments can cause confusion and annoyance for users due to inconsistent experiences and procedures across different platforms. Inconsistent user interfaces and workflows can make it difficult for users to quickly adjust to new payment platforms, leading to confusion and potential mistakes.
- 2.Payment providers may have varying security protocols and guidelines, potentially affecting users' financial data protection. Digital payment systems support various payment methods, but users may struggle to track fees and understand the financial implications of each option, especially for cross-border transactions. This can lead to confusion and potential issues.



User Difficulties with Electronic Payments Issues with Inclusivity and Accessibility

Accessibility and inclusion in digital payments are crucial for diverse users, including those with disabilities and diverse backgrounds, but three user challenges exist.

- Restricted Entry for Individuals with Disabilities.
- Language and Cultural Barriers.
- Insufficient Financial Inclusion.

The following actions are things businesses and organizations might think about taking to solve these issues and enhance inclusivity and accessibility in digital payments

- **Standards for Accessibility:** Digital payment platforms should adhere to accessibility guidelines like the Web Content Accessibility Guidelines (WCAG) to ensure accessibility for individuals with disabilities.
- **Multilingual Assistance:**
- **Initiatives for Financial Inclusion:** Work together with NGOs, governments, and financial institutions to advance financial inclusion by partnering on projects that give underprivileged communities access to digital wallets, internet connectivity, and basic financial services.
- **User Education:** Provide tutorials and educational materials in several forms to help users, particularly those who are unfamiliar with digital banking, comprehend and navigate the digital payment process.
- **All-inclusive Style:** Take inclusive design into consideration while creating digital payment systems. As soon as the design process begins, take into account the requirements of a wide range of users.
- **Feedback Systems:** Address accessibility and inclusivity issues in digital payments by creating feedback channels for users to report problems and suggest enhancements, ensuring equal participation in the digital economy for businesses and consumers.

The following actions are things businesses and organizations should think about taking to solve these issues and improve privacy and confidence in digital payments

To ensure user privacy and trust, companies should implement robust data privacy procedures, educate users about privacy policies, invest in advanced security tools, display certifications and trust seals, provide user control over their information, and provide prompt customer service. Regular security audits and assessments are also essential to identify vulnerabilities and maintain high user trust. Digital payment providers can establish and preserve a good reputation for security and dependability by proactively addressing trust and privacy concerns. This is crucial for drawing and keeping consumers in the cutthroat world of digital payments.

How Low User Experiences Affect Digital Payments' Lower Adoption Rates

Digital payment adoption rates can be impacted by poor user experiences, such as loss of trust, abandoned transactions, growing customer support needs, and negative word of mouth. Trust is crucial for financial transactions, and a damaged trust can prevent users from using the platform. Abandoned transactions can result in lost income for businesses, and customer support needs may increase due to increased support inquiries. Negative word of mouth can also damage the platform's reputation and discourage new users.

User attrition can lead to churn and a decrease in a digital payment service's sustainability. Users may resist new features or services, viewing them as potential issues. A platform's competitive disadvantage lies in its subpar user experiences, as rivals with higher satisfaction, security, and usability ratings attract and retain users.

How Bad User Experiences Affect Customer Dissatisfaction with Digital Payments

Poor user experiences on digital payment platforms can lead to decreased customer satisfaction, decreased loyalty, increased abandonment rates, bad word of mouth, and higher support demands. Irrate customers may leave the platform, leading to negative reviews and potential deterrence. Additionally, frustration can lead to overburdened customer service teams and increased operating expenses. Therefore, it's crucial for platforms to address these issues to maintain customer satisfaction and loyalty.

Dissatisfied customers may use a platform less frequently, leading to reduced conversion rates. Issues with payment processes, product descriptions, or user experience can cause user churn, potentially causing income loss. In a competitive market, platforms that annoy users are outperformed by those providing a more dependable experience.

How Bad User Experiences Affect Digital Payments by Raising Support and Fraud Expenses

Inadequate user experiences on digital payment platforms can lead to higher support and fraud expenses for service providers and users. This includes higher expenses for customer support, which requires more resources and longer response times. Additionally, resolution time and resource allocation may be diverted from other projects or platform enhancements. Furthermore, inadequate user experiences can facilitate fraudsters' ability to exploit system vulnerabilities, potentially leading to unintentional deception.

Service providers may face increased expenses for fraud prevention and detection due to subpar user experiences. This could lead to costly reimbursements and complaints, causing losses for the platform provider. Additionally, high fraud rates and unresolved support issues could undermine user trust and damage the platform's brand name.



Solutions and Suggestions for Bettering Digital Payments' User Interface Design

To improve user experience on digital payment platforms, prioritize user-centered design through usability testing, surveys, and research. Create personas and build with their needs in mind. Simplify navigation by logically arranging features and materials. Maintain a uniform layout to foster familiarity and facilitate information search, ensuring a coherent experience.

The text emphasizes the importance of responsive user interfaces, visual hierarchy, and user-friendly structures in making payments. It emphasizes the need for mobile responsiveness, visual hierarchy, and user-friendly forms, highlighting the need for effective input masks, auto-formatting, and validation to minimize errors.

Implement instant feedback and verification for users, including confirmation messages and loading indicators, to ensure transactions are processed. Cut down on steps for quick, easy payment processing.

Remedies and Suggestions Simplified Processes for Digital Payments on the Internet

To improve user experience, digital payment platforms should implement a one-page checkout form, offer a guest checkout option, store credit card details for future transactions, and use explicit progress measures. These solutions can reduce the number of steps needed, simplify the process, and help users manage their time and expectations. By implementing these solutions, digital payment platforms can streamline their operations and provide a seamless user experience.

The text highlights the use of auto-fill features to automatically input user data into form fields, recommending payment methods based on past transactions. It also mentions the integration of mobile wallets like Apple Pay and Google Pay, the inclusion of express checkout buttons, and the provision of various payment options.

Improvements in Security and Suggestions for Digital Payments

Online payments require enhanced security protocols to protect private financial data and prevent fraud. Two-Factor Authentication (2FA) is recommended, requiring users to present two or more forms of identification before completing transactions. Encryption from end to end is also crucial, making it harder for cybercriminals to intercept sensitive data. Tokenization is another solution, ensuring that intercepted tokens are replaced with unique decryption keys. Regular software updates are also crucial.

User education on secure digital payment methods, including phishing prevention, password confidentiality, and account monitoring, is crucial. Multi-channel verification, behavioral analysis, and biometric authentication are also recommended to reduce unauthorized payments. Using sophisticated fraud detection systems and biometric authentication, such as fingerprint or facial recognition, further enhances security.

Solutions and Advice for Educating Digital Payments Users

Digital payments require education to ensure safety and security. To teach users, provide easy-to-follow instructions through interactive apps, webinars, or online workshops. Offer in-app advice and guidance to help navigate settings, security options, and capabilities, ensuring users have practical experience and support.

To address customer inquiries, provide FAQ sections on your website or app. Offer prompt customer support via phone, email, or chat. Provide security awareness training on common risks like malware and phishing. Emphasize privacy and data protection, using strong passwords and keeping login information private.

Financial literacy programs should focus on digital payments, highlighting their affordability, speed, and ease of use. Security mechanisms like tokenization, multi-factor authentication, and encryption should be discussed to ensure user trust and transparency in these systems.

Following suggestions and solutions are offered

The text emphasizes the importance of clear terms of service, open fee structures, real-time transaction notifications, and a clear privacy policy for digital payment platforms. It emphasizes the need for users to understand their rights and responsibilities, avoid hidden fees, and enable easy data management.

The text emphasizes the importance of security information, regulatory compliance, customer help, user reviews, trust seals, and transparency in data use. It emphasizes the need for a platform that adheres to applicable laws, offers quick responses to user inquiries, encourages user ratings, displays trust seals and certifications, and provides consumers with choices about their data usage.

Case Studies: Effective Digital Payments Implementations

Digital payment implementations have transformed financial services, particularly for underbanked and unbanked citizens in Kenya. Mobile money platforms like M-Pesa, Alipay, and WeChat Pay have become widespread in China, promoting financial inclusion and reducing cash usage. Paytm in India has evolved from bill payment to a comprehensive digital payment ecosystem, offering e-commerce, digital wallets, financial services, and UPI payments. Swish in Sweden is a popular mobile payment system, allowing users to pay at retailers, give money to friends, and make purchases online. Apple Pay and Google Pay are major players in the global digital payment market, providing secure and convenient transactions. El Salvador has formally accepted Bitcoin as legal tender, demonstrating the potential of cryptocurrency for financial inclusivity. Square in the USA helps small businesses accept online payments, while Samsung Pay in South Korea is developed by Samsung.



Examining Cases Lessons Learned from Digital Payments Failures

Digital payment failures can be learned from to improve security and effectiveness of payment systems. Case studies like the Democratic Republic of the Congo's National Payment System (SNMP) and India's QR code scams demonstrate the importance of prioritizing digital inclusion in low-connectivity areas. Mobile money services in Uganda face fraud incidents, network disruptions, and regulatory obstacles, leading to user mistrust. Facebook's Libra cryptocurrency project faced political and regulatory challenges, highlighting the need for early interaction with authorities and fostering confidence in new payment methods. The US faced challenges implementing NFC payment systems due to lack of adoption of NFC-capable terminals and security issues. The fall of Mt. Gox, the largest Bitcoin exchange, demonstrates the importance of strong security protocols and adherence to laws in the cryptocurrency industry. Venezuela's government's Petro cryptocurrency initiative faced mistrust and uncertainty. These case studies emphasize the importance of infrastructure preparation, regulatory compliance, security, user education, and trust-building in digital payment systems.

Upcoming Developments in Digital Payments IoT Integration Done Smoothly

The integration of the Internet of Things (IoT) and digital payments has the potential to revolutionize business and communication. Smart home payments, connected car payments, wearable device payments, voice-activated payments, machine-to-machine payments, personalized and contextual payments, location-based payments, blockchain and smart contracts, IoT-enabled retail retailers, healthcare payments, energy and environmental payments, and IoT analytics for payment optimization are some of the future predictions. IoT devices will enable smart home payments, connected car payments, wearable device payments, voice-activated payments, machine-to-machine payments, and location-based payments. IoT devices will also enable IoT-enabled healthcare payments, energy and environmental payments, and IoT analytics for payment optimization. However, regulatory agencies must create standards and guidelines to protect consumer rights, data privacy, and security. The integration of digital payments with IoT offers improved convenience, efficiency, and security, but also raises concerns about security, privacy, and regulation. A balance between innovation and user protection is necessary for the full realization of these trends.

User-Centered Design of Digital Payments is Important

User-centered design is crucial for digital payment systems to enhance user experience, reduce friction, enhance trust, ensure accessibility, and ensure security. A user-centered approach prioritizes user requirements, preferences, and expectations, making the payment process simple, quick, and entertaining. This approach promotes uptake and continuous use, reduces friction, and increases trust in the platform. It also ensures inclusivity, ensuring platforms are usable by a variety of users, including those with disabilities. Security is a key component of user-centered design, and iterative development allows for

data-driven adjustments. Simplicity and clarity are essential for reducing errors and misconceptions, promoting customer loyalty and promoting market penetration. A user-centered design approach can also provide a competitive advantage, save on customer assistance and troubleshooting costs, and lower legal risks by adhering to relevant legislation. Overall, user-centered design improves the platform's long-term performance by encouraging adoption, building trust, and improving user experience.

Industry and Regulatory Action Requested Regarding Digital Payments

Digital payments require industry and governmental action to ensure growth, safety, and inclusion. Key areas include data security, privacy, interoperability, standardization, user education, regulatory clarity, cross-border transactions, fraud prevention, financial inclusion, environmental impact, innovation, dispute resolution, consumer protection, and regulatory clarity. Collaboration between industry players is crucial for a robust digital payment ecosystem.

CONCLUSION

Digital payments have significantly changed financial transactions, with widespread adoption, mobile payments, security concerns, biometric authentication, regulatory developments, cross-border transactions, and cryptocurrency integration. People and companies prefer digital methods over traditional cash and checks, and the ease of mobile devices has led to the growth of digital wallets and mobile payment apps. Governments and regulatory agencies are also investigating ways to control digital payments. This has made international payments more economical and efficient.

Blockchain technology is being explored for improving security and transparency in digital payments. DeFi and NFTs are enabling new options like lending, borrowing, trading, and collectible purchases. IoT integration is allowing smart appliances to conduct transactions. User-friendly interfaces are being prioritized for accessibility. Balancing privacy and compliance is a major challenge. Environmental concerns are being considered as energy use and cryptocurrency mining impact the environment. Digital payments are poised for continuous growth and innovation.

REFERENCES BOOKS

1. "Designing for the Digital Age: How to Create Human-Centered Products and Services" by Kim Goodwin - This book covers various aspects of UX design, including digital payments, and provides practical guidance for creating user-friendly interfaces.
2. "The Design of Everyday Things" by Don Norman - This classic book delves into the psychology of design and user experience, which is relevant to understanding user behaviors and expectations in digital payment systems.

Authors

1. Jakob Nielsen - A prominent usability expert, Nielsen has conducted extensive research on web and mobile usability, including aspects related to digital payments.



2. Don Norman - As mentioned above, Don Norman's work on design and usability is fundamental to understanding how users interact with digital payment systems.
3. Kim Goodwin - Goodwin is known for her expertise in user-centered design and has written extensively on designing digital experiences, including those related to payments.

Research Papers

1. "User Experience in the Age of Sustainability: A Framework for Sustainable Digital Product Design" by Virpi Roto, et al. - This paper explores the connection between UX and sustainability in digital products, which may be relevant to digital payment systems.
2. "The Usability of Passwords" by Joseph Bonneau - While not directly related to digital payments, this paper delves into usability aspects related to security, which is crucial in payment systems.
3. "The Psychology of Security" by Bruce Schneier - Understanding the psychology of security can shed light on user behaviors and decision-making processes in digital payment contexts.
4. "Beyond Usability: Evaluating Emotional Response as an Integral Part of the User Experience" by Trevor van Mierlo, et al. - This paper discusses the role of emotional responses in the user experience, which can be significant in digital payment design.
5. "Designing for Digital Trust: Comparing Physical and Digital Interactions" by Sunjun Kim, et al. - This paper explores the challenges and dilemmas related to trust in digital payment interactions.



PAKIKIHAMOK NG MGA BSED-FILIPINO PRE-SERVICE TEACHERS SA PAGBABALIK NG IN-PERSON PRACTICUM: ISANG KWALITATIBONG PANANALIKSIK

Conie B. Cerna¹, Shirrey Ian B. Abueva, PhD²

¹Full-Time Instructor, Kapalong College of Agriculture, Sciences and Technology
ORCID No.: 0009-0008-1170-3234

²Teacher, Atty. Orlando S. Rimando National High School
ORCID No.: 0009-0001-8069-6524

Article DOI: <https://doi.org/10.36713/epra16025>

DOI No: 10.36713/epra16025

ABSTRAK

Ang layunin ng pag-aaral na ito ay patungkol sa pakikihamok ng mga BSED Filipino pre-service teachers sa pagbabalik ng in-person na practicum. Ito ay partikular na tutuklas sa mga hamon na kinakaharap ng mga BSED-Filipino pre-service teachers, ang mekanismo ng pagharap na kanilang ginagamit, at pananaw kung paano tutulungan ang mga praktikumers sa suliranin. Saklaw ng pananaliksik na ito ang mga karanasan ng labing-apat (14) na mga BSED Filipino pre-service teachers sa mga pampublikong paaralan ng kolehiyo na matatagpuan sa Davao del Norte at Davao de Oro sa taong panuruan 2023-2024. Ang mga nasuring pahayag na mula sa tugon ng mga partisipante tungkol sa naranasang mga hamon ay ang mga sumusunod na tema: pangangamba sa harapang pagtuturo; mahirap na pangangasiwa sa silid-aralan; suliranin sa pamamahala ng oras; kakulangan sa kahandaan para sa agarang pagbabalik ng in-person practicum; at problema sa pinansyal na aspeto. Tungkol naman sa pamamaraan nila sa pagharap ng mga nasabing hamon, lumabas ang mga sumusunod na tema: pagkakaroon ng matibay na support system; pagpapanatili ng positibong pananaw sa pagtuturo; pagganyak sa interes ng mga mag-aaral; at pagpapanatili ng pasensya bilang practicumer. Tungkol naman sa kanilang mga pananaw sa in-person practicum, lumutang ang mga sumusunod na tema: in-person practicum bilang isang makabuluhang karanasan; in-person practicum bilang mapaghamong karanasan; at isang multi-task na propesyon. Magiging kapaki-pakinabang ang pag-aaral na ito sapagkat ito ay nagbibigay ng malalim na pag-unawa sa mga hamon at oportunidad na kinakaharap ng mga guro sa kasalukuyang panahon, lalo na sa konteksto ng pagbabago sa sistema ng edukasyon. Sa pamamagitan nito, nakapagbibigay ito ng mahahalagang kabatiran at rekomendasyon upang mapahusay ang kasanayan at kahandaan ng mga guro, na siyang susi sa pagtataguyod ng de-kalidad na edukasyon para sa lahat.

MGA SUSING SALITA: in-person practicum, BSED Filipino, pre-service teachers, harapang pagtuturo, mga mag-aaral, probinsya ng Davao del Norte, probinsya ng Davao de Oro

INTRODUKSYON

Ang paglipat mula sa online na pag-aaral tungo sa face-to-face na practicum ay nagpapakita ng isang malaking hamon para sa mga pre-service teachers, habang sila ay nakikipagbuno sa kawalan ng pagkakaayon sa pagitan ng teoretikal na kaalaman na nakuha sa pamamagitan ng mga birtwal na plataporma at ang praktikal na aplikasyon na kinakailangan sa mga pasilidad ng silid-aralan. Bagama't maaaring nakakuha sila ng matatag na pag-unawa sa mga teorya at pamamaraan ng pagtuturo sa pamamagitan ng mga online na kurso, ang paglipat sa personal na practicum ay nagpapatay sa mga lehitimong alalahanin. Ang kawalan ng pisikal na presensya at tunay na dinamika sa silid-aralan sa panahon ng kanilang mga karanasan sa online na pag-aaral ay maaaring nagdulot ng mga damdamin ng pagkabalisa at pagdududa sa sarili, na humahadlang sa kanilang kumpiyansa at

kakayahang sinisimulan nila ang kanilang harapang praktikum o paglalakbay sa pagsasanay.

Sinaliksik ng ilang pag-aaral ang mga alalahanin ng mga pre-service teachers sa mga bansa sa Southeast Asia kapag lumipat mula sa online na pag-aaral patungo sa face-to-face na practicum. Halimbawa, natuklasan ng isang pag-aaral nina Lee at Sim (2020) sa Malaysia na ang mga pre-service teachers ay nagpahayag ng pangamba tungkol sa pamamahala ng disiplina sa silid-aralan at pagpapanatili ng pakikipag-ugnayan ng mga mag-aaral sa panahon ng personal na pagtuturo ng practicum, dahil ang kanilang teoretikal na kaalaman ay pangunahing nakuha sa pamamagitan ng mga online na plataporma. Bukod pa rito, sa isang pag-aaral ni Nguyen et al. (2019) sa Vietnam, nag-ulat ang mga pre-service teachers na nababalisa tungkol sa pagbuo ng kaugnayan sa mga mag-aaral at pag-angkop sa kanilang mga



diskarte sa pagtuturo upang matugunan ang iba't ibang istilo ng pagkatuto sa panahon ng mga pakikipag-ugnayan nang harapan, dahil ang mga kasanayang ito ay hindi sapat na naisagawa sa online na pag-aaral. Dagdag pa rito, nagbukas ang mga paaralan ng Singapore na nagdulot ng pagkabalisa sa pag iisip ng mga pre-service teachers sapagkat sila ay magtutungo na sa paaralan para sa kanilang in-person practicum sa kabila ng katotohanang ramdam nila ang kakulangan ng kanilang kaalaman sa pagpapatakbo face-to-face na pagtuturo (Low & Tam, 2020).

Samantala, sa Pilipinas, isang pananaliksik na isinagawa nina Tan at Lim (2018) nagbibigay-diin na ang mga pre-service teachers ay nag-aalala tungkol sa kanilang kakayahang epektibong mapangasiwaan ang mga praktikal na aspeto ng pagtuturo, tulad ng pagpapalano ng aralin at paghahatid ng pagtuturo, dahil sa limitadong pagkakatantad sa mga tunay na kaligiran ng silid-aralan sa panahon ng kanilang online na edukasyon. Dagdag pa rito, sinabi rin nila Ismail & Jarrah (2019) na ang mga pre-service teachers ay nakararanas ng matinding pagkabalisa sapagkat sila ay magtuturo na sa mga paaralang siyang magiging kanilang laboratoryong paaralan para sa kanilang pagsasanay. Nakadarama sila ng labis na pangamba sapagkat sila ay naniniwala na ang kanilang mga natutuhan sa panahon ng pandemya partikular na sa online na edukasyon ay hindi pa sapat. Ngunit, sila ay walang magagawa sapagkat ang kanilang in-person practicum ay bahagi ng kanilang kurikulum bilang isa sa mga experiential learning courses.

Dagdag pa rito, sa lokalidad ng Kapalong, Davao del Norte, kung saan nagtuturo ang mananaliksik, ay kapansin-pansin ang kaba at pangamba ng mga pre-service teachers ng BSED-Filipino tungkol sa pagbabalik ng kanilang in-person na praktikum. Marami sa kanila ang aminadong hindi pa lubusang handa sa pagtuturo ng mga bata dahil sa kakulangan ng kanilang in-person na karanasan dala ng distance learning nila sa nagdaang dalawang taong panuruan dulot ng COVID-19 pandemic. Sa pakiwari nila ay hindi pa sapat ang kanilang kaalaman, kasanayan, at saloobin sa pagtuturo ng Filipino sa aktwal na mga mag-aaral dahil ang kanilang mga field study (FS) ay hindi rin nangyari sa harapang pamamaraan na hindi sana ay nakapaghanda sa kanila kahit papaano.

Samantala, may ilang pananaliksik na pag-aaral na isinagawa pananaw ng mga pre-service na guro tungkol sa muling pagbubukas ng mga harapang klase. Isa sa mga ito ay nakatutok sa paggalugad ng pre-service na pagganyak ng mga guro sa frontier region – pangunahing ibinibida ang pagtuturo ng practicum program sa muling pagbubukas ng mga klase ni Maiza et al. (2020). Isa pang pag-aaral ang naggalugad sa kwalitatibong eksplorasyon sa mga paniniwala ng pre-service EFL teachers tungkol sa karanasan sa in-person practicum sa paaralan pagkatapos ng pandemya ni Ufuk (2022). Sa katunayan, isang pananaliksik din ang nag-imbetiga sa mga paghihirap na nararanasan ng mga pre-service na guro ukol sa in-person practicum sa gitna ng pandemya ni Napanoy et al. (2021). Gayunpaman, isinagawa sa lokalidad ng pag-aaral na ito na

nakatutok sa mga pakikihamok ng mga BSED-Filipino pre-service teachers sa pagbabalik ng in-person practicum, kaya ito ang magsisilbing batayan para sa kakulangan sa. Upang punan ang puwang na ito, isasagawa ko itong kwalitatibong pananaliksik gamit ang penomenolohikal na dulog para tuklasin ang nasabing problemang pang-edukasyon na kinakaharap ng mga pre-service teachers sa BSED Filipino.

Upang maibahagi ang makabuluhang impormasyon tungkol sa katotohanan ng pagtuturo ng mag-aaral sa muling pagbubukas ng mga harapang klase sa gitna ng pandemya, ilalahad ang mga ito sa pamamagitan ng mga aktibidad sa paaralan tulad ng Learning Action Cells, pagsasanay, seminar, workshop. Magkakaroon ng mga datos ang mga guro na nakabatay sa pananaliksik na magsisilbing kanilang basehan para sa mga programa at aktibidad na nakatuon sa penomena na kasangkot sa pananaliksik na ito.

Layunin ng Pag-aaral

Ang penomenolohikal na pananaliksik na ito ay patungkol sa pakikihamok ng mga BSED Filipino pre-service teachers sa pagbabalik ng in-person na praktikum. Ito ay partikular na tutuklas sa mga hamon na kinakaharap ng mga BSED-Filipino pre-service teachers, ang mekanismo ng pagharap na kanilang ginagamit, at pananaw kung paano tutulungan ang mga praktikumers sa suliranin.

Sa yugtong ito ng pag-aaral, maituturing ang in-person practicum ng mga BSED-Filipino pre-service teachers bilang isang kursong kinasasangkutan ng mga aktibidad na nagbibigay-diin sa praktikal na aplikasyon ng teorya, lalo na kung saan ang isang estudyante ay nakakakuha ng on-the-job na karanasan sa isang larangan ng pag-aaral. Sa isang internship o practicum, ang mag-aaral ay nagiging bahagi ng isang organisasyon. Ibig sabihin, ito ang bahagi ng kanilang kolehiyo na kung saan ang mga BSED-Filipino pre-service teachers ay nabibigyan ng pagkakataon na mailapat sa aktwal na senaryo ang kanilang mga natutunang teorya.

Mga Katanungan sa Pag-aaral

1. Ano-ano ang mga nagiging karasanan ng mga BSED Filipino pre-service teachers sa kanilang pagsabak sa in-person practicum?
2. Paano hinarap ang mga hamong nararanasan ng BSED Filipino pre-service teachers sa kanilang pagsabak sa in-person practicum?
3. Ano-ano ang pananaw ng mga BSED Filipino pre-service teachers hinggil sa pagsabak sa in-person practicum na maari nilang ibahagi sa ibang pre-service teachers?

Metodolohiya

Ang pag-aaral na ito ay gagamit ng kwalitatibong pamamaraan partikular na ang penomenolohikal na istilo. Sa pananaliksik na ito, mayroong 14 na kalahok na mga BSED-Filipino pre-service teachers mula sa mga napiling kolehiyo sa Davao del Norte at Davao de Oro ang magiging bahagi ng mga gagawing panayam. Ang mga kalahok na ito ay lalahok sa mga panayam bilang



pangunahing mapagkukunan ng mga datos sa pag-aaral na ito. Pitong (7) kalahok ang sasailalim sa malalimang panayam (IDI), habang ang pito (7) pang kalahok ay makikibahagi sa pokus na pangkatang talakayan (FGD).

Higit pa rito, gagamitin ang purposive sampling upang pumili ng mga kalahok para sa pananaliksik na pag-aaral na ito. ang mga kalahok na ito ay pipiliin gamit ang sumusunod na pamantayan: (1) dapat ay opisyal na na-enrol sa napiling kolehiyo ngayong taong panuruan ng 2023-2024; (2) dapat ay isang BSED-Filipino major na pre-service teacher; at (3) dapat ay kabilang sa mga maitatalaga sa in-person practicum sa isang pampublikong paaralan. Sa kabilang dako, hindi maaaring maging kalahok sa pag-aaral na ito ang mga sumusunod: (1) pre-service teachers na may ibang major; (2) ang mga hindi naka-enrol sa napiling kolehiyo; at (3) mga pre-service teachers na maitatalaga sa mga pribadong paaralan.

Bukod dito, gagamitin ang coding sa pagtukoy, pag-uuri, at pagkakatagorya ng mga tugon ng mga kalahok sa panahon ng mga panayam upang makabuo ng konteksto ng mga pampakay na ideya tungkol dito. Sa pag-aaral na ito, gagamitin ko rin ang thematic analysis pagkatapos i-coding ang mga ideya at konsepto

ng mga tugon. Sa proseso ng pag-aaral na ito, isasaalang-alang rin ang etikal na konsiderasyon upang mapangalagaan ang kapakanan ng mga kalahok.

MGA RESULTA

Mga Karasanang ng mga BSED Filipino Pre-service Teachers sa Pagbabalik ng In-Person Practicum

Nang maanalisa ang tugon at kasagutan ng mga partisipante sa unang katanungan tungkol sa mga karanasan nila bilang BSED Filipino pre-service teachers sa pagbabalik ng in-person practicum ay isa-isa nilang inilad ang mga hamong kinaharap nila sa naturang karanasan.

Ang mga nasuring pahayag na mula sa tugon ng mga partisipante ay nakabuo ang mga sumusunod na tema: (1) pangangamba sa harapang pagtuturo; (2) mahirap na pangangasiwa sa silid-aralan; (3) suliranin sa pamamahala ng oras; (4) kakulangan sa kahandaan para sa agarang pagbabalik ng in-person practicum; at (5) problema sa pinansyal na aspeto. Ang mga pangunahing ideya at mga tema tungkol sa mga naranasang hamon ay makikita sa unang talahanayan.

Talahanayan 1

Mga Pangunahing Tema at mga Ideya Tungkol sa mga Hamong Naranasang ng mga BSED Filipino Pre-service Teachers sa Pagbabalik ng In-person Practicum

Mga Pangunahing Tema	Mga Pangunahing Ideya
Pangangamba sa Harapang Pagtuturo	Pagkabahala kung maisasagawa nang maayos ang tungkulin sa loob ng klase Pagkasanay sa birtwal na pamamaraan ng pagkatuto Pangangambang dulot ng <i>new normal</i> na sistema ng edukasyon Pangangamba at takot sa paggawa ng wastong banghay-aralin Pangangambang dala ng sari-saring abilidad ng mga mag-aaral at kanilang pagiging mas komportable sa wikang Ingles Pangangamba sa mga hamon ng edukasyon sa pagbabagong dala ng pandemya
Mahirap na Pangangasiwa sa Silid-aralan	Pagkaramdam ng hamong dala ng epektibong pagbibigay ng emosyonal na suporta sa mga mag-aaral Pagharap sa hamon ng pamamahala sa maiingay na mag-aaral Pagdisiplina sa mga mag-aaral dahil sa kanilang iba't ibang asal Pagharap sa mga mag-aaral na matitigas ang ulo at hindi nakikinig Pakikibagay sa hindi kaaya-ayang pag-uugali ng mga mag-aaral Pagpapatupad ng iba't ibang pamamaraan ng pagdisiplina
Suliranin sa Pamamahala ng Oras	Pagbibigay ng sapat na oras para maghanda sa klase Pagkaiwan ng ibang asignatura dahil sa sobrang pagtutok ng atensyon sa praktikum Pagka-apekto sa oras ng pagpapahinga, pre-review, at iba pa dahil sa <i>in-person practicum</i> Pagbalanse ng oras bilang mag-aaral sa unibersidad at bilang <i>practicumer</i> Pagka-apekto sa oras para sa pamilya at sarili dahil sa <i>in-person practicum</i> Pagka-kumprumiso sa oras sa mga gawain sa simbahan
Kakulangan sa Kahandaan para sa	Pagkakaroon ng kakulangan sa natutunan mula sa higit dalawang taon na blended learning Pagkukulang sa pagkalantad sa aktwal na pagtuturo



Agarang Pagbabalik ng In-person Practicum	Pagkawala ng sapat na aplikasyon sa mga natutunan mula sa online na pag-aaral Pagkakaroon ng kasalatan sa kaalaman sa pagtuturo
Problema sa Pinansyal na Aspekto	Pagbabadyet ng pera para sa iba't ibang paglalaanan nito Pagharap sa sabay-sabay na bayarin sa paaralan Pagkakaroon ng kakulangan sa pera pambili ng mga kagamitan Pagharap sa problema sa pera para pangtustos sa araw-araw na pangangailangan

Mga Pamamaraan sa Pagharap ng mga Hamong Naranasan ng mga BSED Filipino *Pre-service Teachers* sa Pagbabalik ng In-Person Practicum

Nang maanalisa ang tugon at kasagutan ng mga partisipante sa ikalawang katanungan tungkol sa mga pamamaraang ginawa ng mga BSED Filipino *pre-service teachers* sa pagharap sa mga hamon ng *in-person practicum* ay isa-isa nilang inilahad ang kanilang mga estratehiya.

Ang mga nasuring pahayag na mula sa tugon ng mga partisipante ay nakabuo ng sumusunod na tema: (1) pagkakaroon ng matibay na support system; (2) pagpapanatili ng positibong pananaw sa pagtuturo; (3) pagganyak sa interes ng mga mag-aaral; at (4) pagpapanatili ng pasensya bilang practicum. Ang mga pangunahing ideya at mga tema tungkol sa mga naranasang hamon ay makikita sa ikalawang talahanayan.

Talahanayan 2

Mga Pangunahing Tema at mga Ideya Tungkol sa mga Pamamaraan sa Pagharap ng mga Hamong sa Pagbabalik ng In-person Practicum

Mga Pangunahing Tema	Mga Pangunahing Ideya
Pagkakaroon ng Matibay na Support System	Pagtitiwala sa tulong ng suportang natatanggap mula sa pamilya, CT, at kapwa practicumers Pagtatanong sa mga kakilalang dating <i>pre-service teachers</i> pati na rin sa mga CT Paglinang ng kakayahan sa pagtuturo sa tulong ng suporta at <i>feedback</i> na binibigay ng CT Paghingi ng mga suhestiyon at payo ng mga CT ukol sa pagtuturo bilang practicumers Pagpapatatag ng kalooban sa tulong ng suportang bigay ng pamilya Paghingi ng mga estratehiya mula sa mga CT na makakatulong sa pagtuturo bilang practicumers Paghingi ng gabay mula sa mga CT na makakatulong sa pagtuturo bilang practicumers
Pagpapanatili ng Positibong Pananaw sa Pagtuturo	Pagtitiwala sa sariling kakayahan at pananalig sa Panginoon Pagkakaroon ng motibasyon na maging isang ganap na guro sa hinaharap Pagkakaroon ng motibasyon tungkol sa pangarap para sa sarili at sa pamilya Pagkakaroon ng motibasyon na makaahon sa kahirapan Pagkakaroon ng positibong paniniwala na ang pagtatapos sa <i>in-person practicum</i> at kolehiyo ay makakatulong sa mas magandang kinabukasan Makitang natututo ang mga mag-aaral bilang pandagdag sa positibong pananaw Pagmamahal sa kursong BSED Filipino upang mapanatili ang positibong pananaw
Pagganyak sa Interes ng mga Mag-aaral	Pagkakaroon ng kaalaman sa interes ng mga mag-aaral Paggamit ng mga kawili-wiling estratehiya sa pagtuturo Paggamit ng teknolohiya at mga edukasyonal na laro upang mas lalong maengganyo ang mga mag-aaral Pagtukoy sa interes ng mga mag-aaral upang maengganyo sila sa loob ng klase Pagkilala sa mga mag-aaral upang makaisip ng mga gawaing hindi sila mababagot Pagsasagawa ng mga gawaing gaganyak sa mga mag-aaral na makilahok sa klase
Pagpapanatili ng Pasensya bilang Practicum	Pagpapahaba ng pasensya sa tuwing naiingayan na sa mga mag-aaral Pagpapanatili ng pasensya lalo na sa iba-ibang personalidad ng mga mag-aaral Pag-unawa sa pagkakaibaiba ng mga mag-aaral upang mapahaba ang pasensya

Mga Pananaw ng mga BSED Filipino *Pre-service Teachers* sa Pagbabalik ng In-Person Practicum

Nang maanalisa ang tugon at kasagutan ng mga partisipante sa ikatlong katanungan tungkol sa mga pananaw ng mga BSED Filipino *pre-service teachers* sa pagharap sa mga hamon ng *in-*

person practicum ay isa-isa nilang inilahad ang kanilang mga ideya.

Ang mga nasuring pahayag na mula sa tugon ng mga partisipante ay nakabuo ang mga sumusunod na tema: (1) *in-person practicum* bilang isang makabuluhang karanasan; (2) *in-person practicum*



bilang isang mapaghamong karanasan; at (3) isang multi-task na propesyon. Ang mga pangunahing ideya at mga tema tungkol sa mga naranasang hamon ay makikita sa ikatlong talahanayan.

Talahanayan 3

Mga Pangunahing Tema at mga Ideya Tungkol sa mga Pananaw ng BSED Filipino *Pre-service Teachers* sa Pagbabalik ng *In-person Practicum*

Mga Pangunahing Tema	Mga Pangunahing Ideya
<i>In-person Practicum</i> bilang isang Makabuluhang Karanasan	Pagkakaroon ng makatotohanang karanasan sa pagtuturo Pagkakalantad sa reyalidad ng pagtuturo Pagkakaroon ng pang-unawa sa totoong pagpapahala ng klasrum Pagkakaroon ng kamulatan sa totong senaryo ng pagtuturo at pagkatuto Pagkakaroon ng ideya kung magpapatuloy pa ba sa propesyon Pagpapalago ng kakayahan sa pagtuturo Pagkakaroon ng mahahalagang aral
<i>In-person Practicum</i> bilang isang Mapaghamong Karanasan	Pagkadama ng kakaibang saya dala ng <i>in-person practicum</i> Pagkatuwa na makita ang mga mag-aaral na ginagawa ang mga gawaing binigay Pagkakaroon ng hindi malilimutang oportunidad at alaala Pagpapataba ng puso dulot ng mga positibong komento ng mga mag-aaral Pagdadala ng mga hindi malilimutang karanasan mula sa <i>in-person practicum</i>
Isang <i>Multi-task</i> na Propesyon	Pagkatanto na hindi biro ang hirap at pagod ng isang guro Pagiging pangalawang magulang ng mga mag-aaral na tutulong sa paghubog ng kanilang pagkatao Pagharap sa maraming hamon sa propesyon ng pagtuturo ngunit lahat ay may solusyon Pagkatanto na hindi biro ang propesyon ng pagtuturo sapagkat iba-iba ang istilo ng pagkatuto ng mga mag-aaral Pagkatanto na isang sakripisyo ang pagtuturo ngunit nakakapagbigay ng masarap na pakiramdam

Pangwakas na Pahayag

Sa pagwawakas ng aking pag-aaral, aking napagtanto na ang bawat tema, mula sa Pangangamba sa Harapang Pagtuturo hanggang sa Isang Multi-task na Propesyon, ay sumasalamin sa dinamiko at komplikadong kalikasan ng larangan ng edukasyon. Ang mga hamong ito, bagamat nakakatakot, ay nagsilbi ring daan para sa personal at propesyonal na pag-unlad. Aking natutunan na sa bawat suliranin, may nakatagong oportunidad para sa pagbabago at paglago, hindi lamang para sa mga guro kundi pati na rin para sa mga mag-aaral.

Dagdag pa, ang pag-aaral na ito ay nagbigay-diin sa kahalagahan ng pagkakaroon ng isang matibay na support system. Ang suportang ito, mula sa kapwa guro, administrasyon, pamilya, at komunidad, ay mahalaga hindi lamang sa pagharap sa mga hamon kundi pati na rin sa pagpapanatili ng positibong pananaw sa pagtuturo. Ito ay nagpapaalala sa akin na sa bawat yugto ng ating propesyonal na buhay, mahalaga ang pagkakaroon ng isang network na magbibigay ng suporta, gabay, at inspirasyon. Maliban pa rito, ang mga tema tulad ng Suliranin sa Pamamahala ng Oras at Kakulangan sa Kahandaan para sa Agarang Pagbabalik ng *In-person Practicum* ay nagpapakita ng pangangailangan para sa adaptasyon at pagbabago sa harap ng mabilis na pagbabago ng teknolohiya at mga pangangailangan ng sektor ng edukasyon.

Aking natutunan na ang pagiging bukas at handa sa pagbabago ay susi sa pagiging epektibo at relevant bilang isang edukador sa modernong panahon.

Gayon din, ang pag-aaral na ito ay nagbigay-diin din sa kahalagahan ng propesyonalismo at pagkamalikhain sa pagtuturo. Ang temang Pagganyak sa Interes ng mga Mag-aaral at Pagpapanatili ng Pasensya bilang Practicumer ay nagpapaalala sa akin na ang pagiging guro ay hindi lamang isang trabaho kundi isang sining at misyon na nangangailangan ng dedikasyon, pasensya, at pagkamalikhain.

Sa kabuoan, ang pag-aaral na ito ay hindi lamang nagbigay ng pananaw sa mga hamon at oportunidad sa larangan ng edukasyon kundi nagbigay rin ng inspirasyon sa akin na magpatuloy na mag-ambag at mag-innovate sa sektor na ito. Ang mga aral na aking natutunan ay gagamitin ko bilang gabay sa aking patuloy na paglalakbay bilang isang edukador at mananaliksik. Sa huli, ang pagtuturo ay isang patuloy na proseso ng pag-aaral, pagtuklas, at pagbabahagi ng kaalaman, hindi lamang para sa sarili kundi para sa kinabukasan ng bawat mag-aaral na ating hinuhubog.

REKOMENDASYON

Ang mga lumabas na tema sa pag-aaral na ito ay nagbibigay ng mahalagang insight sa kasalukuyang estado at mga hamon ng



praktika ng pagtuturo para sa mga pre-service teachers. Mula sa mga temang tulad ng pangangamba sa harapang pagtuturo, mahirap na pangangasiwa sa silid-aralan, hanggang sa pagpapanatili ng positibong pananaw sa pagtuturo, ang bawat isa ay nagpapakita ng iba't ibang aspeto na nakakaapekto sa karanasan at pagganap ng mga pre-service teachers sa kanilang propesyon.

Ang pagkilala sa mga pangamba at stress na nararanasan sa harapang pagtuturo at sa pangangasiwa ng silid-aralan ay kritikal. Ito ay nangangailangan ng pagpapatupad ng mga epektibong estratehiya para sa stress management at professional development. Ang pagbibigay ng sapat na training at suporta, tulad ng pagpapalakas ng kakayahan sa classroom management at pagbibigay ng mga resource para sa mental health, ay esensyal upang matulungan ang mga pre-service teachers na maging mas kompetente at mas matatag sa harap ng mga hamon.

Gayunpaman, ang pagpapanatili ng positibong pananaw sa pagtuturo ay mahalaga para sa personal at propesyonal na pag-unlad ng mga pre-service teachers. Ito ay nangangahulugan ng pagkakaroon ng patuloy na pagpapahalaga sa kanilang trabaho at ang pagtuklas ng mga bagong pamamaraan upang mapanatili ang kanilang motibasyon at sigla sa pagtuturo. Ang pagbibigay ng mga oportunidad para sa professional growth, tulad ng mga seminar at workshop, ay makakatulong sa mga pre-service teachers na palawigin pa ang kanilang kaalaman at kasanayan.

Ang tema na pagganyak sa interes ng mga mag-aaral at pagkakaroon ng matibay na support system ay nagpapahiwatig ng kahalagahan ng pagtugon sa indibidwal na pangangailangan ng mga mag-aaral at pagpapatibay ng relasyon sa pagitan ng guro at estudyante. Ito ay nangangailangan ng pagiging sensitibo sa iba't ibang learning styles at pangangailangan ng mag-aaral, at pagpapatupad ng mga inclusive at interactive na pamamaraan sa pagtuturo upang mas maging engaging at makabuluhan ang kanilang pag-aaral.

Sa ganitong konteksto, napakahalaga na ang mga paaralan at iba't ibang institusyon ng edukasyon ay magtakda ng sapat na mga suportang pisikal, mental, at propesyonal para sa kanilang mga pre-service teachers. Ang pagkakaroon ng maayos na sistema ng mentoring at pagtuturo, kasama ang regular na feedback at suporta mula sa mga experienced teachers at mga guro sa pag-unlad, ay maaaring makatulong sa paghubog at pagpapaunlad ng mga pre-service teachers sa kanilang propesyon.

Samakatuwid, ang implikasyon ng mga lumabas na tema sa praktika ng pagtuturo ay malawak at multifaceted. Ang pagharap sa mga hamong ito ay nangangailangan ng holistikong diskarte na sumasaklaw hindi lamang sa personal na aspeto ng mga pre-service teachers kundi pati na rin sa institusyonal at sistemikong lebel. Sa pamamagitan ng pagtugon sa mga temang ito, maaaring mapabuti hindi lamang ang kagalingan at kasiyahan ng mga pre-service teachers kundi pati na rin ang kalidad ng edukasyon na kanilang naibibigay. Sa huli, ang pag-unlad at pagpapahusay sa

praktika ng pagtuturo ay isang patuloy na proseso na nangangailangan ng dedikasyon, adaptability, at patuloy na pag-aaral mula sa lahat ng stakeholder sa larangan ng edukasyon.

Para sa mga susunod na mananaliksik, isang magandang direksyon ay ang pagsaliksik sa iba't ibang aspeto ng karanasan ng mga BSED-Filipino pre-service teachers sa kanilang pagbabalik sa in-person practicum. Maaaring isaalang-alang ang paggamit ng iba't ibang pamamaraan tulad ng kwalitatibong at kuantitatibong pag-aaral upang mas mapalalim ang pag-unawa sa paksa. Mahalaga rin na suriin ang mga potensyal na hamon at hadlang na kanilang kinakaharap sa kanilang practicum, pati na rin ang mga estratehiya at suporta na kanilang natatanggap mula sa kanilang mga institusyon at guro.

Pangalawa, maaaring magkaroon ng pagpapalawak sa saklaw ng mga kalahok sa pag-aaral upang mas maging representatibo ito sa iba't ibang mga pre-service teachers mula sa iba't ibang mga institusyon at antas ng edukasyon. Dagdag pa rito, mahalaga rin na isaalang-alang ang papel ng teknolohiya sa kanilang mga karanasan at paano ito maaaring makatulong sa kanilang pagpapaunlad bilang guro.

Sa pangatlo, maaring pag-aralan ang mga implikasyon ng kanilang practicum sa pagkatuto ng mga mag-aaral, anuman ang mga positibong epekto nito sa akademikong pag-unlad ng mga mag-aaral. Ito ay upang maipakita ang layunin ng programa ng edukasyon para sa mga guro at ang kanilang papel sa pagpapaunlad ng mga estudyante.

Sa mga sumusunod na pananaliksik, mahalaga ring suriin ang mga epekto ng practicum sa kanilang mga guro sa hinaharap, kasama na ang kanilang kakayahan sa pagtuturo, pagpapamalas ng leadership, at ang kanilang pangmatagalang pagpapaunlad bilang propesyonal sa larangan ng edukasyon.

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OUT-OF-FIELD SPECIALIZATION TEACHING

Jenny Rose Oronos- Tumacder, Samantha Lalican Policarpio

ABSTRACT

This study entitled Out-of-Field Specialization Teaching focused on teachers teaching out-of-field of specialization subjects.

This research sought to determine the concerns and challenges of teachers teaching out-of-field of specialization in Nueva Ecija High School.

The researcher utilized the descriptive method of research to aid the study and the purposive sampling technique in the gathering of data.

This study was conducted to 30 respondents from Nueva Ecija High School where all are teachers handling different subjects.

Results revealed that those teachers who are teaching out-of-field subjects have performed satisfactorily specifically in terms of the following; mastery of the subject matter, teaching strategies and methodologies and management of learning. It also appeared in this study that they less often experienced difficulties in mastering their subject matter. They never encountered problems relating to teaching. Competencies of teachers are upgraded through seminars and trainings that they have attended.

Based on the results, the researchers recommend the following: the school administrators may upgrade the competencies of their teachers in the form of seminars, trainings, scholarships and other forms of retooling activities specifically for teachers who teach out-of-field of specialization subjects. Priority be given to those teachers who need to be retrained, while stipends may be provided to those mentor who will assist those new recruits in the field. A similar study can be conducted in other schools or divisions to come up with more data and should involve students for better understanding the impact of out-of-field teaching to learning.

KEYWORDS: *out-of-field of specialization*

INTRODUCTION

Field of specialization with regards to academe is a course of study or area of concentration where individuals gain expertise. Teachers who have the degree in Bachelor of Secondary Education took their major subjects and were considered as their field of specialization. They possessed specific knowledge and skills about their field of specialization that can be deemed above the basic and general understanding of the subject. Thus, their qualifications and capabilities are suited to teach the subjects within their field.

Teachers' role in the transfer of knowledge is significantly important and influential to students learning. Their mastery in the subject matter opens the door to the attainment of high quality graduates. However, the training and the requirements of teachers to teach out-of-field subjects is considered one of the factors of the students' underachievement.

Moreover, there is a worldwide shortage of well-trained teachers. According to the UNESCO Institute for Statistics (UIS), 69 million teachers must be recruited to achieve universal primary and secondary education by 2030.

It is a fact that in most public and even private educational institutions, quite a number of teachers are assigned to teach subjects which are not aligned with their field of specialization.

In some instances, subjects that are assigned to them are totally different from their expertise. This is so, due to some reasons such as the lack of qualified teachers to be hired for the specific field needed or because of the unexpected increase in enrollment. For this, teachers' versatility and competency are put to a test. Those who cannot turn down the request of their administrators will give their best efforts to teach the subject in spite of their lack of sufficient knowledge on the subject matter. It may generally thought of that the teaching of subjects which is not based on specialization may affect the quality of the teaching and learning process. While the problem can be remedied, the immediacy of solving the problem may not be that easy to attain.

According to Ingersoll (2003), each year some out-of-field teaching takes place in more than half of all U.S. secondary schools, and each year over one fifth of the public 7th-12th grade teaching force engages in this practice. And, in schools whose students come from low-income households, the percentage of teachers teaching out of their field is much higher. All these can be attributed to selective shortages of teachers, as well as misplacement of teachers.

The purpose of this research is to study the performance of out-of-field secondary teachers and the challenges they encountered in teaching subjects out of their specialization.



Statement of the Problem

The study sought to determine the competencies as well as the challenges encountered by the teachers handling out-of-field of specialization subjects.

Specifically this study sought answers to the following question:

1. How may the profile of the teachers describe in terms of the following:

- 1.1 Present teaching position;
- 1.2 Field of specialization; and
- 1.3 Subject taught.

2. How may the competencies of teachers teaching out-of-field of specialization subjects be described based on the following:

- 2.1 Mastery of the subject matter;
- 2.2 Teaching strategies;
- 2.3 Teaching methodologies;
- 2.4 Management of learning; and
- 2.5 Student motivation?

3. How may the challenges of the respondents be described in terms of:

- 3.1 Mastery of the subject matter;
- 3.2 Teaching strategies and methodologies; and
- 3.3. Management of learning?

4. What are the implications brought by the teaching of out-of-field of specialization subjects to the quality of graduates?

Conceptual Framework

The conceptual frameworks on which this study is based, and which have been used as analytical tools to understand the collected data, are informed by concepts related to teacher in Republic Act No. 7836, also known as the "Philippine Teachers Professionalization Act of 1994" an act to strengthen the regulation and supervision of the practice of teaching in the Philippines and prescribing a licensure examination for teachers and for other purposes; and the published work of the American Educational Research Association authored by Lee S. Shulman (1986), titled *Those Who Understand: Knowledge Growth in Teaching*.

In Article 1 Section 2 of the Republic Act No. 7836 as mentioned in its statement of policy: The State recognizes the vital role of teachers in nation-building and development through a responsible and literate citizenry. Towards this end, the State shall ensure and promote quality education by proper supervision and regulation of the licensure examination and professionalization of the practice of the teaching profession.

In Section 3(a) of the same Article, the objective posits the promotion, development and professionalization of teachers and the teaching profession.

The terms in Section 4 clearly define the following:

(a) "Teaching" — refers to the profession concerned primarily with classroom instruction, at the elementary and secondary levels in accordance with the curriculum prescribed by the Department of Education, Culture and Sports, whether on part-time or full-time basis in the private or public schools.

(b) "Teachers" — refers to all persons engaged in teaching at the elementary and secondary levels, whether on full-time or part-time basis, including industrial arts or vocational teachers and all other persons performing supervisory and/or administrative functions in all schools in the aforesaid levels and qualified to practice teaching under this Act.

A conceptual analysis of knowledge for teachers would necessarily be based on the work of Lee S. Shulman (1986). He clearly stated the pendulum in research and policy circles about the missing paradigm with respect to the knowledge content as the defining characteristic of pedagogical accomplishment and the blind spot with respect to content that now characterizes most of the state-level programs of teacher evaluation and teacher certification. The emphasis of most research in teaching is on how teachers manage their classrooms, organize activities, allocate time and turns, structure assignments, ascribe praise and blame, formulate the levels of their questions, plan lessons, and judge general student understanding. However, researches sometimes left questions unasked about the domains and the categories of teacher knowledge such as the content of the lessons taught, the questions asked and the explanations offered. The framework for classifying both the domains and categories of teacher knowledge: propositional knowledge, case knowledge, and strategic knowledge.

Propositional knowledge is when a research examined the teaching, learning and explore its implications for practice.

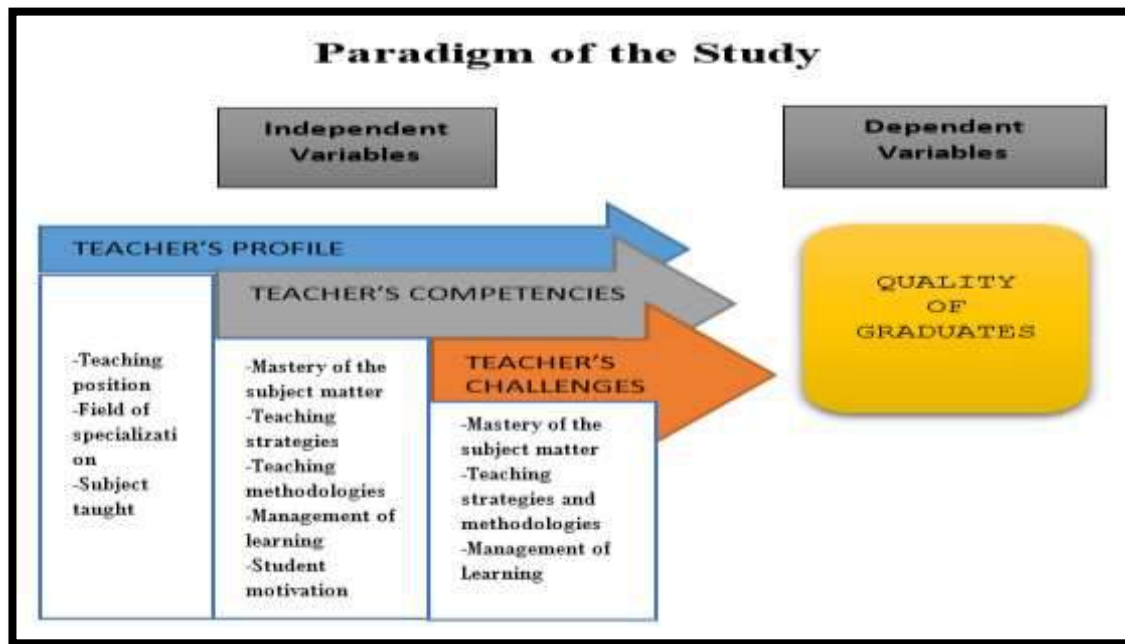
Case knowledge is knowledge of specific, well-documented, and richly described events. Whereas cases themselves are reports of events or sequences of events, the knowledge they represent is what makes them cases. The cases may be examples of specific instances of practice-detailed descriptions of how an instructional event occurred-complete with particulars of contexts, thoughts, and feelings. On the other hand, they may be exemplars of principles, exemplifying in their detail a more abstract proposition or theoretical claim.

Strategic knowledge. Strategic knowledge comes into play as the teacher confronts particular situations or problems, whether theoretical, practical, or moral, where principles collide and no simple solution is possible. Strategic knowledge is developed when the lessons of single principles contradict one another, or the precedents of particular cases are incompatible.

The following figure represents the framework of the study.



Figure 1
 Research Paradigm



Research Methodology (bullet type)

The researcher used the descriptive method of research. Descriptive research describes and interprets “what is”. It reveals the conditions practices that are held or are not held; processes that are going on or otherwise, affect trends that are developing.

According to Calderon, (1993) Descriptive method of research is a purpose process of gathering, analyzing, classifying, tabulating data about prevailing conditions, practices, beliefs, processes, trend and cause effect relationship and then making inadequate and accurate interpretation about such data with or without the aid of statistical method.

This study attempted to describe the competencies and challenges of teachers teaching out-of-field of specialization subjects in Nueva Ecija High School. This was done through the use of survey method, where the checklist questionnaire was used in the gathering of data. It deals primarily with data gathering procedures and instruments to secure information.

Research Design

This study utilized a survey instrument which aimed to describe the competencies and challenges of teachers assigned to teach out-of-field of specialization subjects in Nueva Ecija High School. Thirty secondary school teachers from Nueva Ecija High School located along Burgos St., Cabanatuan City.

Data Gathering Procedures

The questionnaire was fielded to target respondents comprising of teachers Nueva Ecija High School in the province of Nueva Ecija. Data gathered were collated following the protocol and that the confidentiality of information and data that were obtained was

assured to the respondents. The administration of the questionnaires was personally conducted by the researcher.

Population of the Study

The respondents of this study is comprised of thirty high school teachers from Nueva Ecija High School and were chosen through purposive sampling, wherein, the sample are investigated based on the judgment of the researcher. According to Maxwell (2002), purposive is a type of non-probability sampling in which particular settings, person or events are deliberately selected for the important information they can provide that cannot be found from other choices. The researcher choose specific people within the population which are appropriate to be used for a particular study.

In this study, thirty teachers were chosen based on the subject/s they were presently handling which was/were out of their fields of specialization.

Research Locale

The respondents of the study were the secondary school teachers from Nueva Ecija High School located along Burgos St., Cabanatuan City.

Research Instrument

The main instrument in gathering the data is a modified questionnaire. Before preparing the questionnaire, the researcher gathered information from different sources such as published or unpublished researchers. The questionnaire was founded on a survey instrument of the previous study entitled “Teachers’ Performance and the Related Factors of Different Colleges at Laguna State Polytechnic University San Pablo, Laguna”.



The set of questionnaire intended for teachers is composed of three parts: teachers' profile, teachers' competencies and teachers' challenges in teaching out-of-field of specialization subjects.

The first part of the questionnaire includes the personal profile of the respondents such as present teaching position; field of specialization; and subject taught.

The second part of the questionnaire under the competencies of teachers teaching out-of-field of specialization subjects consist of their mastery of the subject matter; teaching strategies; teaching methodologies; management of learning; and student motivation.

The third part of the instrument includes three categories that describe the challenges of teachers in the following aspects such as mastery of the subject matter, teaching strategies and methodologies, and management of learning.

Statistical Treatment of Data

The data gathered is analyzed and interpreted using the following statistical tools: frequency and percentage, weighted mean and weighted frequency. According Shapiro (2008), percentage frequency specifies the percentage frequently distribution is a display of data that specifies the percentage of observations that exist for each data point or grouping of data points. It is tabular arrangement of data by classes or categories together with their corresponding call frequencies. Class frequency refers to the number of the observations belonging to a class interval, or the number of the items within the categories. A class interval is grouping category defined by a lower limit hand upper limit. (Tan 2006).

Frequency and percentage are used in the processing of data for the respondent's profile. The following formula was used to extract the percentage of frequencies and responses.

Where:

P = percentage

f = frequency

N = total number of respondents

100 = is a constant multiplier

Weighted Mean

There are times when values are given more importance than others. The mean derived in this case is known as the weighted mean. Weighted mean is use to describe the degree of the respondents' responses on the five point rating scale in the questionnaire. The formula in computing the weighted mean is:

Weighted Mean (WM)- Total weighted frequency (TWF)

Total number of respondents (N)

Where:

WM= weighted mean

N= total number of respondents

f= frequency

TWF=total weighted frequency

WF= weighted frequency

On the other hand, the formula for weighted frequency is as follows:

Weighted frequency

$WF = W \times f$

Where:

WF= weighted frequency

W=degree of response

f= frequency

Verbal Description

The weighted mean of the ratings were computed and interpreted using statistical limits with their corresponding descriptive equivalents as follows:

Figure 2
Mode of Response

Weighted/Numerical Value	Numerical Response	Verbal Interpretation
4.20-5.00	5	Outstanding Always Strongly Agree
3.40-4.19	4	Very Satisfactory Often Agree
2.60-3.39	3	Satisfactory Sometimes Uncertain
1.80-2.59	2	Fair Seldom Disagree
1.00-1.79	1	Needs improvement Never Strongly Disagree



PRESENTATION, ANALYSIS AND INTERPRETATION OF DATA

1. Profile of the Respondents

Table 1

Distribution of Teachers according to Present Teaching Position

Present Teaching Position	TEACHER	
	Frequency	Percentage
Teacher I	13	43.33
Teacher II	9	30
Teacher III	6	20
Master Teacher I	2	6.67
TOTAL	30	100

Table 1.1 shows the distribution of the respondents according to their present teaching position and reveals that majority of the respondents with 59.55% are teacher I; followed by 9 or 30%

teacher II; 6 or 20% teacher III; and the least is 2 or 6.67% for Master Teacher.

Table 2

Distribution of Teachers According to field of Specialization

Field of Specialization	TEACHER	
	Frequency	Percentage
English	7	23.33
General Science	6	20
Filipino	5	16.67
TLE	5	16.67
MAPEH	4	13.33
Mathematics	3	10
TOTAL	30	100

Table 1.2 above shows that most of the respondents are English majors with 7 or 23.33%; followed by General Science with 6 or 20%; Filipino and TLE with 5 or 16.67%; MAPEH with 4 or 13.33% and Mathematics with 3 or 10%. Study indicates that a

greater number of respondent-teachers are English and General Science majors, while there are less MAPEH and TLE majors.

Table 3

Distribution of Out-of-field Subjects Taught by Teachers for the Last 3 years

Field of specialization	Teachers		
	Frequency	Percentage	Rank
Filipino	13	43.33	1 st
ARALING PANLIPUNAN	9	30	2 nd
VALUES EDUCATION	6	20	3 rd
TLE	2	6.67	4 th
TOTAL	30	100	

Table 3 shows the list of subjects taught by secondary teachers which is out of their fields of specialization. The Filipino subject tops the list for having 13 or 43.33%; followed by Araling Panlipunan with 9 or 30%; Values education ranks 3rd with 6 or 20% ; and TLE with 2 or 6.67% and was placed at the bottom of

the out-of-field subjects. This implies that there are few teachers who are specialized in Filipino and Araling Panlipunan. The subject Values Education on the other hand, was offered as field of specialization for teachers only for quite a few decades.



2. How may the competencies of the respondents be described in terms of the following:

Table 4
Mastery of the Subject Matter

MASTERY OF THE SUBJECT MATTER	Mean	VERBAL interpretation	Rank
1.Can discuss the lesson without relying too much on the reference materials.	4.20	Outstanding	5
2.Can share additional information related to the topic.	4.37	Outstanding	3
3.Integrates the topic on real life circumstances.	4.40	Outstanding	2
4.Links the current topic with past and future lessons.	4.48	Outstanding	1
5.Can deliver accurate and update information on the topics being discussed.	4.34	Outstanding	4
AVERAGE WEIGHTED MEAN	4.36	Outstanding	

Table 4 states the mastery of the subject matter showed that ranked first is the ability of the teacher to link the current topic with the past and future lessons with a mean of 4.48. Second in rank is the ability of a teacher to integrate the topics to real life situations with a mean of 4.40. Teachers can share additional information related to the topic ranked third with a mean of 4.37. Teachers can deliver accurate and update information on the topics being discussed ranked fourth with 4.34. The ability of the

teacher to discuss the lesson without relying too much on the reference materials ranked last or fifth with a mean of 4.20.

This means that teachers ensure that they have mastery of the content of the subjects that they teach. This may indicate that teachers see to it that they have sufficient knowledge of the subjects being assigned to them.

Table 5
Teaching Strategies

TEACHING STRATEGIES	MEAN	VERBAL INTERPRETATION	RANK
1.Provides an activity that engage students in meaningful learning.	4.46	Outstanding	1
2.Provides immediate and positive feedback to obtain desirable attitude and behavior.	4.39	Outstanding	4
3.Allows students to fake action and independence into their own learning.	4.40	Outstanding	3
4.Innovates learning activities that maximize student's potentials and responsibilities.	4.36	Outstanding	5
5.Clear, systematic instructions are provided to students to obtain the expected outcomes.	4.42	Outstanding	2
AVERAGE WEIGHTED MEAN	4.41	Outstanding	

Table 5 shows the teaching strategies used by teachers. Statements were ranked based on the weighted mean on how teachers provide activity that engages students, giving immediate positive feedback that acquires desirable behavior, allowing students to be independent in their actions, innovating learning activities and the provision of clear, systematic instructions that can obtain the expected outcomes.

Regarding the teaching strategies of teachers, having the highest weighted mean of 4.46 and interpreted as outstanding is on the item that teachers must have commendable and outstanding skills

in ensuring that activities are provided where students are engaged in making learning meaningful. With an average weighted mean of 4.41 and was inferred as **outstanding**, teachers believe that when it comes to strategizing the teaching process, activities shall be provided to make students attach themselves to learning that are meaningful for them. Those activities are ensured that it was clear, systematic and follows the plan laid to obtain the objectives are being innovated to allow students to take action into their learning and maximize their potentials and responsibilities.



Table 6
Teaching Methodologies

TEACHING METHODOLOGIES	MEAN	Verbal interpretation	RANK
1.Sets lesson objectives based on learner's prior knowledge, interest and motivation	4.39	Outstanding	5
2.Facilitates learning through meaningful and student-centered approaches	4.36	Outstanding	3
3.Creates positive atmosphere in the classroom by recognizing individual uniqueness and capabilities.	4.49	Outstanding	2
4.Organizes and manages learning activities that develop student's creativity and thinking ability.	4.52	Outstanding	1
5.Creates situations that encourage learners to use high order thinking skills.	4.34	Outstanding	5
AVERAGE WEIGHTED MEAN	4.42	Outstanding	

As shown in table 6, teacher-respondents indicated outstanding to all those items which include setting the lesson prior to learner's knowledge, facilitates learning through meaningful and student centered approaches, creating positive classroom atmosphere by recognizing, organizing and managing learning activities that develop student's creativity and thinking order skill.

Given the average weighted mean of 4.42 and described as outstanding, it signifies that out-of-field and mixed academic teachers are **outstanding** in designing the teaching methods that

alleviate the teaching learning-process, where teachers organize and manage the learning activities based on the lesson objectives set for the lesson and activities are aligned to the learner's schema, field of interest and motivation. Student-centered approaches are utilized in facilitating the learning process that encourages the learners to use their high order thinking skills and lift their energy in developing their creativity and critical thinking ability. This shows that teaching cannot settle for less, but teaching should always aim for excellence because this will rebound towards better learning and competitive learners.

Table 7
Management of Learning

MANAGEMENT OF LEARNING	MEAN	Verbal interpretation	RANK
1. Establishes routines and procedures to maximize time allotted for instruction.	4.46	Outstanding	1
2. Translates learning competencies to instructional objectives.	4.38	Outstanding	3
3. Provides activities and uses materials which will fit the learner's learning diversity.	4.40	Outstanding	2
4. Chooses instructional materials in line with the instructional objectives.	4.37	Outstanding	4
5. Diagnoses problems affecting the student's learning and interest.	4.34	Outstanding	5
AVERAGE WEIGHTED MEAN	4.40	Outstanding	

Table 7 shows the positive stance of respondents with their uniform outstanding responses on all the items of management of instruction. Results were interpreted as natural response from respondents who believe in the benefits of managing well the process of instruction.

Establishing routines and procedures in order to maximize time for instruction'' is ranked 1st with a mean of 4.46 interpreted as

''**outstanding**''. This means that to be able to manage instruction well, proper planning is necessary to maximize the allotted time for instruction.

Overall, this table is not different from the previous results starting from table 9 that respondents will certainly agree on all the items presented in these table data, because they are positively started.

**Table 8 Student Motivation**

STUDENT MOTIVATION	MEAN	Verbal interpretation	RANK
1.Encourages student to be active and interested in the subject.	4.53	Outstanding	2
2.Motivates student who lacks interest in the subject.	4.44	Outstanding	3
3.Recognizes different learning abilities and work with them individually.	4.42	Outstanding	4.5
4.Promote excellence and rigor in an encouraging environment.	4.42	Outstanding	4.5
5. Respect individual differences.	4.58	Outstanding	1
AVERAGE WEIGHTED MEAN	4.48	Outstanding	

Table 8 shows the competencies of teachers in terms of student motivation. "Respecting individual differences is the proper way to motivate students" which obtained a weighted mean of 4.58 ranked first in students motivation. "Recognizes different learning abilities and work with them individually" and "Promote

excellence and rigor in an encouraging environment" both ranked last with the mean of 4.42. Once the student felt that they were respected, it is the head start that they will respect their teachers as well.

3. How may the challenges of the respondents be described in terms of:

Table 9
Mastery of the Subject Matter

MASTERY OF THE SUBJECT MATTER	MEAN	Verbal interpretation	Rank
1.Difficulty of setting the clear objectives of the lesson	2.01	Rarely	1
2. Hardly concentrates on the subject matter due to unfamiliarity.	1.93	Never	2
3.Suffers from mental block or lack of spontaneity during discussion due to insufficiency of knowledge.	1.73	Never	4
4.Nearly loses confidence and eagerness to teach.	1.64	Never	5
5.Tendency	1.82	Rarely	3
AVERAGE WEIGHTED MEAN	1.83	Rarely	

Table 9 shows the challenges of the teachers in terms of the mastery of the subject matter. It is good to note that respondents do not encounter so many problems in terms of the mastery of the subject matter. This is shown by their responses in all the item that resulted in an average weighted mean of 1.83 interpreted as

"rarely". This can be further interpreted that teachers try to maintain their enthusiasm in their profession and do not allow themselves to remain static. Rather, they are challenged to teach whatever subject is assigned to them.

Table 10
Teaching Strategies and Methodologies

TEACHING STRATEGIES AND METHODOLOGIES	MEAN	Verbal interpretation	RANK
1.Runs out-of-gas syndrome in some occasion .	1.78	NEVER	2
2.There are times that the learning materials are not applicable to the lesson due to lack of preparation.	1.72	NEVER	3
3.Tends to consult the lesson plan every now and then.	1.89	RARELY	1
4.Important points are not emphasized due to lack of sufficient information on the subject matter	1.69	NEVER	4
5.Suffers from burn-out due to lack of competence on the subject.	1.61	NEVER	5
AVERAGE WEIGHTED MEAN	1.74	NEVER	

Table 10 shows the challenges encountered by teachers in terms of teaching strategies and methodologies. Data gathered were

summed up to get the weighted mean and provided the corresponding interpretation. Items include the having the



running out-of-gas syndrome, the inapplicable materials due to lack of preparation consultation to lesson plan, failing in emphasizing important points due to limited information and suffering burn-out because of lacking competencies.

Consulting the lesson plan every now and then, gets the highest mean of 1.89 that corresponds to "rarely" as interpretation,

explains that most of teachers review a little on the blueprint of the lesson to make sure of the proper order of events.

Meanwhile, having the average of 1.47 and interpreted as never, it explains that the teachers never encounter problems on the strategies and methods employed in instruction.

Table 11
Management of Learning

Management of Learning	MEAN	Verbal interpretation	RANK
1. Proper reinforcement strategies are failed to be done.	1.71	NEVER	4
2. Fails to motivate student's interest due to lack of appreciate teaching strategies.	1.59	NEVER	5
3. Lacks the additional instructional methodology needed to reinforce learning.	1.72	NEVER	3
4. Tends to become subject centered because of the need to prove mastery of the subject matter.	1.84	RARELY	1.5
5. Teaching process becomes merely the transfer of facts and information.	1.84	RARELY	1.5
AVERAGE WEIGHTED MEAN	1.74	NEVER	

Table 11 shows shows the challenges encountered by teachers in terms of management of learning. The mean and the corresponding interpretation of the results are arranged from highest to lowest that includes the items of failing to give the proper reinforcement and motivation to student's due to lack of strategies and instructional methodology needed, becomes subject-centered to prove one's mastery and teaching process are only transfer of facts and information.

Being subject-centered and instructions are merely transferring of facts to students are rarely experienced by teachers in their instruction. This reflected that teachers really have the prowess to deliver and manage the content of their instruction, where they devote time to master it so that motivating students and reinforcing the students will be successfully done.

4. What are the implications brought by the teaching of out-of-field of specialization subjects to the quality of graduates? (bullet type)

It is important to recognize the implications brought by the teaching of out-of-field of specialization subjects to the quality of graduates. The data about teacher training or practices and the approaches to student performance is difficult at best. For example, more experienced teachers with better backgrounds may be assigned to teach out-of-field of specialization subjects in classes composed of more motivated or well-prepared students. It also is important to understand that student performance on various kinds of standardized examinations reflects the curriculum studied up to the time students take a particular examination, a state or a nation's cultural emphasis on and support for education, and many other variables. Some of these factors are likely to have at least as much influence on test performance, if not more so, than teachers.

CONCLUSION AND RECOMMENDATIONS

Conclusions

It was found out in this study that a great majority of the teachers have position of teacher I and handling Filipino subject for the last three years. Although they are handling subjects that are not their field of specialization, they are well-prepared and well-adjusted.

Teacher's challenges in term of mastery of the subject matter, teaching strategies, teaching methodologies and management of learning have a good result in this research study. They were capable of utilizing difference methods and strategies in teaching. They are well prepared in performing and meeting and objectives of their lesson and other tasks including their obligation and responsibilities. They tried to achieve personal significance in the challenge of their profession and reflect every now and then to be able to think clearly and act responsibly on the task and the content of situations.

Recommendations

In the finding and conclusions of this study, the following recommendations are hereby given:

1. As teachers, there are certain concerns and challenges brought about by teaching subjects which are out of their fields of specialization. Schools administrators may give the appropriate support for these teachers in terms of training, scholarship, provision for instructional materials and facilities.
2. Similar study may be conducted in other districts or division to come up with other essential data that will support the findings of this research study.



3. Parallel study may be conducted that will include administrators and students.
4. Seminars or trainings for teachers who are teaching mixed academic subjects and out-of-field specialization may also be given priority by the school administrator to improve their skills in teaching subjects which are not their field of specialization.
5. Giving material or non-material incentives for mentors assisting those new recruits.

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LINGUISTIC LANDSCAPE OF FRENCH LANGUAGE IN TOURISM EDUCATION

Dr. J. Eugene

Lecturer, Institute of Hotel Management Catering Technology & Applied Nutrition
C.I.T Campus, Taramani, Chennai – 600 113
ORCID iD: <https://orcid.org/0000-0001-6206-7938>

Article DOI: <https://doi.org/10.36713/epra16037>
DOI No: 10.36713/epra16037

ABSTRACT

A significant amount of momentum has been gained in French as a Foreign Language in recent times, and it continues to flourish as a language that is highly sought after by young people everywhere. The French language is considered to be an inescapable language in hotel schools, which is why it is interesting to note that the tourism business in India receives the highest number of tourists from France. Additionally, the French food has effectively established itself as an antique cuisine. During the time that Tourism and Hotel Management courses were being developed, the French language was more prevalent in the sense that it gained the most popularity and was believed to be required to be learned as part of the requirements for the course. Under the circumstances that currently exist, is the French language still a preferred choice? The purpose of this paper is to provide a response to this question and to take into consideration the various facets of the French language. This piece of writing is one of a kind since it employs the qualitative research method to portray the purpose in a manner that is both moving and compelling. This engaging narrative article is an interesting one to read and treasure because it is interwoven with primary and secondary sources and contains rich theoretical insights.

KEYWORDS: French, Language, Tourism, Education

THE PROLIFIC PREAMBLE

One of the most important components of education in the field of tourism and hotel management is the ability to communicate effectively. In order to communicate effectively, it is necessary to articulate one's thoughts, ideas, words, and voice. Therefore, languages play a crucial part in strengthening the mental process of a speaker, which is necessary in order to fulfil this.

In the study of languages lies the key for the solution of evolution, psychology and many other ologies about mankind which have beset the scientists for ages... [1]

Liveliness can be found in every language. It creates a network, brings people together, and provides entertainment. There are a great number of languages spoken in India, and they are dispersed across different regions of the country. On the other hand, not everyone is proficient in languages other than their mother tongue and the language that is officially recognized. Despite the fact that every state in India makes every effort to promote its own language, English continues to be the dominant language in the workplace and in other areas of life. In order to compete with more alluring career opportunities in other countries, the French language has emerged as a catalyst for the minds of the general population in India. This is a continuation of the fact that people have accepted, enjoyed, and are continuing to cultivate French to the best extent possible. In the tourism industry, this is especially true. There is no question that the French cuisine is the factor that should be attributed. Here, it is said that the movement of French people as group

tours and the antiquity of the French language have made it imperative to compromise in choosing French as the foreign language of study for tourism professionals. This is because French is an ancient language. In order to provide a more comprehensive understanding of the situation at hand, the paper will now proceed to provide an explanation of the history of French cuisine.

METICULOUS METHODOLOGY

To investigate the reason for teaching French language to students studying Tourism and Hotel Management, and to gain a comprehensive understanding of the results of teaching and learning French language in this field, a qualitative research method is considered the most suitable approach. This method involves using qualitative research tools such as interviews, observation, participation techniques, and content analysis to uncover interesting findings. In addition to these primary sources, several secondary sources such as reputable books, journals, and relevant publications are carefully employed to create this reliable research paper.

THE CONTINUUM HYPOTHESIS

The purpose of this study is to investigate the prospects of teaching and learning French in the tourism and hotel industry in India. It does so by maximizing and exemplifying the relevance of teaching and learning French.



FORAY INTO FRENCH CUISINE AND LANGUAGE

Creating dishes that are brimming with richness and variety is the hallmark of French cuisine, which is a singular form of culinary art that combines flavorful and nourishing ingredients with dexterity. Given that the very word "cuisine" comes from the French language, it is not surprising that French cuisine continues to be regarded as one of the most popular food types all over the other countries. The preparation of true French cuisine is regarded as both an art and a craft. French cuisine is not equal to the food itself; rather, it encompasses more than just the food itself. Over the course of its history, French cuisine has undergone a process of self-reinvention, resulting in its transformation into a product that is well recognized and highly sought after all over the world. The nomenclature of French cuisine as one of the World's Intangible Cultural Heritage was bestowed upon it by the United Nations Educational, Scientific, and Cultural Organization (UNESCO) in March of 2010 [2]. This particular cuisine has been there for a long time, particularly in Puducherry, and even now, it is highly sought after by tourists who come to this hamlet. The reasons behind the honor bestowed on French cuisine, that of finding itself a place in the UNESCO list, are that – French food is the perfect choice of cuisine for any social, political and cultural gathering, French food brings people together with great bonhomie thereby stimulating social synchronization and solidity, French food pairs wonderfully well with wines and French food is categorically served course by course, beginning with hors d'oeuvres, flamboyantly served with an aperitif (hard beverages served while commencing the meal) and grandly concluding with dessert and liqueurs in a manner which is solely unique to French cuisine [3]. UNESCO experts commend French gastronomy as a,

Social custom aimed at celebrating the most important moments in the lives of individuals and groups [4]

It is interesting to note that French cuisine is considered to be one of the most influential cuisines in the world, and it has established itself as a component of the curriculum of hotel management all over the world. French is used to describe each and every component. French is used to read out the hierarchy of the kitchen. As a result, they are able to successfully occupy a crucial role in the education of hospitality professionals. The foundation of the French East India Company by King Louis XIV on September 7, 1664, deepened the roots of the French as they colonized various parts of India [5]. This occurred in accordance with the French colonization of India. As they expanded, their food also spread at a rapid pace, and the French boast that they were the first to say that

...the French invented the cuisine of culinary professionals...
[6]

TOURISM AND FRENCH LANGUAGE

It is amazing that India has a track record of attracting an increasing number of tourists from other countries year after year [7]. India's wide variety of tourist destinations and its rich cultural legacy are the two most important factors contributing to the country's success in attracting more visitors from other countries. Due to the fact that France is one of the top 10 foreign countries that create the most visitors' footfalls in India, France is particularly significant as a source of tourists. The French nationals have a strong connection to India because they regard it to be their colonized territory. They are more eager to travel to the places that were once their colonies. As a result, the inclusion of French as a foreign language of study for the degree programs in Tourism has been beautifully improved as a result of the broad presence of the French. The flood of visitors from France to India is displayed in Table.1, which illustrates the predominant desire of the French to explore the diverse and different characteristics of India.

Table.1 French Tourists' arrivals to India

S.No	Year	No.of Tourists in lakhs
1	2000	100022
2	2001	102434
3	2002	78194
4	2003	97654
5	2004	131824
6	2005	152258
7	2006	175345
8	2007	204827
9	2008	207802
10	2009	196462
11	2010	225232
12	2011	231423
13	2012	240674
14	2013	248379
15	2014	246101
16	2015	230854

(Source: India Tourism Statics, 2015)

It is very evident that the movement of French visitors is across the length and width of India, which is a very intriguing aspect

that draws attention to itself. The disembarkation of French tourists in many locations of the country is a feature that draws



attention to itself. Forty-four percent of French tourists disembarked at the airport in New Delhi in the year 2015, whereas twenty-six percent in Mumbai, nineteen percent in Chennai, ten percent in Bengaluru, and one point three percent in Kolkata [8]. A striking fact that eloquently depicts the pulsing participation of French tourists in declaring their presence at various sites throughout the country is presented here.

Although the aforementioned facts cannot be considered the sole motivators for the French language to be an essential component of tourism, the French colonies that are portrayed as the "window of French Culture" such as Puducherry require students of tourism to acquire French language skills in order to facilitate an open and honest conversation with French visitors who are not hindered by any language barrier.

RATIONAL

The incorporation of the French language as a subject in the curriculum of hotel management can provide students who are interested in pursuing professions in the hospitality sector with a number of benefits, including the following:

Global Relevance

French is spoken widely across the world, especially in the hospitality industry. Many luxury hotel chains, gourmet restaurants, and international organizations use French as a primary or secondary language.

Enhanced Communication Skills

Learning French equips students with the ability to communicate effectively with French-speaking guests, colleagues, and suppliers, thereby improving customer service and interpersonal skills.

Cultural Understanding

Studying French allows students to gain insights into French culture, customs, and traditions. This cultural competence is essential for providing personalized and culturally sensitive services to French-speaking clientele.

Career Opportunities

Proficiency in French opens up a wide range of career opportunities in the global hospitality industry. It can lead to employment in French-speaking countries, multinational hotel chains, international event management companies, and tourism boards.

Competitive Advantage

In a competitive job market, candidates with language skills often have a competitive edge. Employers value multilingual employees who can cater to diverse clientele and contribute to the internationalization of their businesses.

Networking Opportunities

Speaking French enables students to network with French-speaking professionals in the hospitality sector, attend industry events, and participate in international internships or exchange programs.

Preparation for Advanced Studies

For students interested in pursuing further education or research in hospitality management, proficiency in French may be a prerequisite for admission to certain programs or institutions, especially those in French-speaking countries.

TEACHING FRENCH

The Institute of Hotel Management, which is currently regarded as one of the best universities in India for hotel management, was founded in the 1960s by the Ministry of Tourism, Government of India in key cities around the nation, including Delhi and Chennai. A French language class was added in response to the desire for more exposure to French cuisine. The addition of French as a second foreign language was solely justified since students majoring in Hotel Management were heavily involved in continental cuisine. Words like "bon appétit," "gastronomy," "gourmet," etc., are still used often in both academia and the business world.

The fact that the subject also featured a written exam for one hundred marks was the most difficult obstacle. Due to the fact that the pupils had never been exposed to the French language in the course of their schooling, this was considered to be a difficult task. For the most part, it was English and the corresponding mother tongues. Despite the fact that the National Council was presented with a number of requests to reduce the amount of content, no compromise was reached. Up until the 1990s, this was the norm. Following that, the 100 points were reduced to fifty points for the theoretical paper [9]. What happened? The theory component was eliminated beginning in the year 2000, and moving forward, the subject was presented in the form of an oral practical paper. As of right now, there is no longer any practical paper available in French. Within the context of the Front office subject, it is listed as a unit. The non-adaptability of the language among the pupils is brought to light by this slow decrease or declining phenomenon, which also has a significant impact on the usage of the language.

FACTUAL FINDINGS

The personal interviews conducted with the users of the French language offered valuable insights on certain aspects of the language. A few student respondents assayed that they learned French. The personal interviews that were carried out with people who actually use the French language provided extremely helpful insights about some features of the language. A couple of the students who responded to the survey stated that the only reason they learnt French was because it was required of them based on the course curriculum. They were forced to study it, rather than learning it because they were interested in it [10]. There are a few respondents who hold key positions in the tourism and hotel industry who have expressed their opinion that they do not use the French language in their day-to-day routine because they have forgotten what they had learnt and also because there is a lack of necessity to speak French [11].



CANDID CONCLUSION

Perfect practice is necessary for achieving mastery of a language. The findings of this study make it abundantly clear that the sole purpose of teaching French to students of Tourism and Hotel Management is to get a degree, and not for the purpose of a lifelong application. This conclusion is confirmed by the number of hours that are given for instruction in the language concerned. The answer to this shortcut approach to express learning is to enroll in a full-fledged language programme that was designed specifically for French. It is possible to incorporate French language classes into the curriculum for hotel management by taking dedicated language classes, participating in language immersion programmes, completing internships in places where French is spoken, and incorporating French language materials into coursework that is connected to hospitality. Language competency should be combined with practical skills that are applicable to the hospitality sector, such as customer service, cultural awareness, and business communication. It is necessary that the curriculum be designed in such a way that brings these two aspects together. Within the context of the present day, the French language has not established a major position.

However, as the saying goes...

The fetishizing of the French language has its parallel in the adoration of French Cuisine, both presumed simply not excellence but also superiority and order.
[12]

As the proverb goes, the French language is a good language that was once swaying with prosperity. This is true. In the present day, it is surrounded by a multitude of competitors, such as German, Japanese, Spanish, and so on, which are making their way into the academic world and the business world. It is standing tall and inviting everyone to seek a profession that is both promising and lucrative in another country.

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THE EMPLOYMENT RATE AND EMPLOYABILITY STATUS OF BACHELOR OF SCIENCE IN OFFICE ADMINISTRATION GRADUATES FROM ACADEMIC YEAR 2018 TO 2019: A TRACER STUDY

*¹Sherlyn Mae T. Lopez, *²April Mae T. Callo, MBA, *³Jonelson C. Escandallo, PhD

*¹Program Coordinator, Office Management Department, Kapalong College of Agriculture, Sciences, and Technology, Philippines.

*²Faculty, Office Management Department, Kapalong College of Agriculture, Sciences, and Technology, Philippines.

*³Program Coordinator, Institute of Teacher Education, Kapalong College of Agriculture, Sciences, and Technology, Philippines.

Article DOI: <https://doi.org/10.36713/epra16000>

DOI No: 10.36713/epra16000

ABSTRACT

Tracer study is very important as a way of understanding the relevance and quality of programs offered by the higher education institutions as well as the labor market. Thus, the purpose of this quantitative study is to trace the graduates of the Kapalong College of Agriculture, Sciences and Technology (KCAST). Particularly, the study was conducted among 87 graduates of Bachelor of Science in Office Administration (BSOA) in A.Y. 2018-2019. The researchers found out that majority of the course contents of their program are relevant to their career requirements. In terms of employability rate of the graduates, more than half of them got employed one to three months after the graduation. Most of them are single and 23 years of age. 43.6% of the respondents are currently working as full-time in their job. With the data gathered, the researchers concluded that through their competent communication and interpersonal skills, graduates were more likely to land on the jobs connected to the degree they have studied. Therefore, the researchers recommend that the institution, particularly the department, should hold various job fairs and extensive seminars, as well as training and lectures for the graduating office administration students which are designed based on the specific needs of the industry.

KEYWORDS: Office Administration Graduates, employment, quantitative-descriptive method, tracer study, Philippines.

INTRODUCTION

Every goal of an academic institution is to produce competent and highly qualified graduates that can eventually be competitive in a local, national, and global arena. A graduate tracer study is a very powerful tool that can provide valuable information for evaluating the whereabouts and performance of the graduates in the workplace (Cuadra et al., 2019). On the other hand, at present, there is a larger pool of tertiary graduates. However, many do not have the relevant skills needed for successful integration into the labor market. These students put a strain on publicly funded institutions of higher learning and many countries with limited resources are struggling to finance the growing needs of a larger student body, without compromising the quality of their educational offerings (The World Bank, 2017).

In Africa, graduate tracer study provides information regarding typical career trajectories as well as higher education programme relevance and development, based on the reflections and evaluations of the educational experiences and employment activities of alumni from higher education institutions. Importantly, graduate tracer studies can be distinguished from graduate opinion or exit surveys which, in the South African context, typically survey alumni at the point of graduation. Several South African higher education

institutions conduct graduate surveys at their graduation ceremonies, and these surveys typically “aim to gather a quick ‘snapshot’ of job search behavior, employment status, entry-level salaries, as well as satisfaction with the higher education institution, the curriculum they offer and its relevance to the workplace (Kiguli-Malwadde, 2014).

In Taguig City, University tracer study offer ample experience regarding the situation of graduates, which might help to extend viewpoints among the University administrators, faculty as well as students. However, in the increasingly competitive and corporate world, it is very critical to many college graduates to enter the workplace with the suitable skills to not just only survive but to also be successful in their own profession because some of college graduates are not totally prepared in entering the workplace. The focus of this tracer study is the Office Administration which falls under the College of Business Management. The researchers move to execute this tracer study to determine the employment status and nature of work of the graduates, determine the key factors affecting their employability, and to determine its relationship with one another to be able to make useful recommendations to the College of Business Management (Castro 2017).

The Kapalong College of Agriculture, Sciences and Technology started its operation last 2005 and it was the very



first local college to be accredited by the Association of Local Colleges and Universities – Commission on Accreditation (ALCUCOA) Level 1 in Region XI. Now, in its desire to continually upgrade and enhance its teaching pedagogies to educate and train young professionals to be part of the ranks of young professionals worldwide, the Kapalong College of Agriculture, Sciences and Technology deemed it fit to conduct a tracer study for its professional graduates to establish their employability including employment status. Also, this is for the institution to acquire insights or suggestions as to what improvements or innovations can be introduced into the current curriculum to further strengthen the viability of its young professionals in the field of employability related to their field and course of expertise.

Thus, it is now in this premise that this tracer study must be conducted to check the employment rate including employment status, job mismatching and location of work whether local or abroad of the graduates coming from the program BS in Office Administration. This is for the institution to response its social obligations and values by developing and designing curriculum which will ensure the employment of the students after graduation. Through this study, the institution may revise and enhance its curriculum to answer the diverse and ongoing need of the society with quality education through producing highly competent graduates.

OBJECTIVES OF THE STUDY

The Philippines faces problems of high unemployment and underemployment rates. The unemployment rate in the Philippines as of 2012 was 7% and 21% of these were college graduates (Bureau of Labor and Employment Statistics, 2012). Hence, this study aimed to track and trace graduates of BS in Office Administration in KCAST from academic year 2018 to academic year 2019. Specifically, this study sought to answer the following research objectives:

1. What is the demographic characteristics of the graduate-respondents in terms of:
 - 1.1. sex;
 - 1.2. civil status;
 - 1.3. age;
 - 1.4. educational attainment and development; and
 - 1.5. relevance of the degree to their present job.
2. What is the employment profile and features of the graduate-respondents in terms of:
 - 2.1. employment rate;

RESULTS AND DISCUSSION

Demographic Profile of the Graduate-Respondents

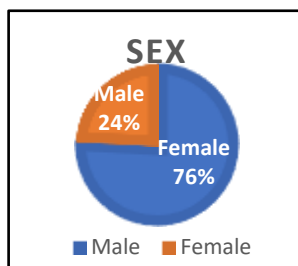


Figure 1 shows the gender profile among Office Administration graduates. Among the 87 respondents of the study, 66 (75.9%) were female and 21 (24.1%) were male. On the other hand, the BS in Office Administration graduates who responded to the tracer study is primarily composed of females at 75.9% while males only constituted 24.1%. This distribution may be attributed to the female-dominant contacts of one of the data gatherers. This may also be indicative of the more responsive nature of females to social networks.

- 2.2. employment status;
 - 2.3. level of income;
 - 2.4. period of seeking the first job after college;
 - 2.5. nature of the present job; and
 - 2.5. job mismatching.
3. What is the level of the graduates-respondent self-rated evaluation with their attitude to work?
 4. What is the level of the graduates-respondent self-rated evaluation with the quality of education provision of the institution?
 5. What is the level of the graduates-respondent self-rated evaluation with the skills and abilities obtained in the institution and its usability with their present occupation?

METHODOLOGY

This study used the descriptive method of research because this tracer study involved a collection of quantitative information that were tabulated in numerical form which is the very nature of descriptive studies. Further, it is also emphasized that this method was used to describe the characteristics of the population or phenomenon being studied. This research method primarily focuses on describing the nature of a demographic segment. In other words, it describes the subject of the research, without covering why it happens (Pamaran & Pamaran, 2013). In context of the current study, the descriptive method of research was utilized to describe the employment rate and employment status of the Office Administration graduate. This is to quantify to what extent is the employment rate of the graduates to describe the employment status as well as their demographic profile specifically, with their gender, age, and civil status.

Further, the study includes a total of 27 graduates from Batch 2018 which were composed of 5 males and 22 females and another 60 graduates from Batch 2019 which was composed of 16 males and 44 females. All in all, the study includes a total of 87 graduates. Additionally, the research instrument that was used in gathering the data was adopted from the study of Escandallo (2024) which was used in a tracer study for Elementary Education graduates. The instrument was further validated in context to office administration graduates. It was checked by the panel of experts and have undergone another set of pilot test.

Figure 2 shows the profile of the graduates in terms of civil status. It indicates that among the 87 respondents of the study, 83 (95.4%) were single and 4 (4.6%) were married. Specifically, the single respondents from the BS in Office Administration is 95.4%. This trend is primarily attributed to the inclusive years of graduation from which the respondents were taken. The study only considered the years 2018-2019. Hence, many of the respondents are still young with an average age of 23 and are not yet married.

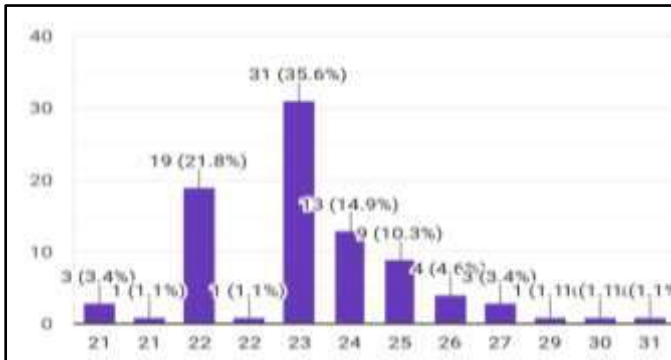
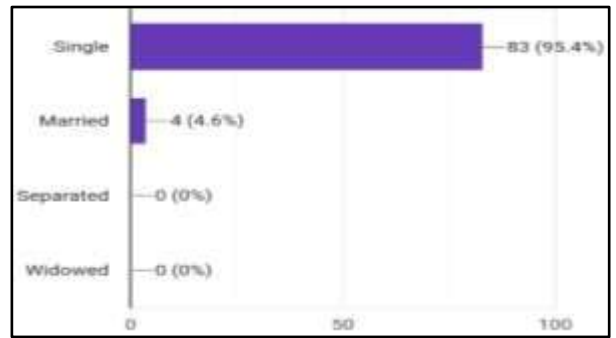


Figure 3 shows the age of the respondents. 31(35.6%) of the respondents are 23 years old, 19 (21.8%) are 22 years old, 13 (14.9%) are 24 years old, 9 (10.3%) are 25 years old, 4 (4.6%) are 26 years old, 3 (3.4%) are 27 years old, 1 (1.1%) are 29, 30 and 31 years old. Most of the respondents belong to this age bracket because majority of them graduated in their 20's.

Figure 4 revealed that all the graduate respondents of BS in Office Administration did not pursue higher education after finishing their BSOA degree. This may imply that the respondents have not pursued a master's degree because it is not their priority. However, there are 5 (7%) of the respondents who take short-term courses such as earning education courses to take the Licensure Examination for Teachers.

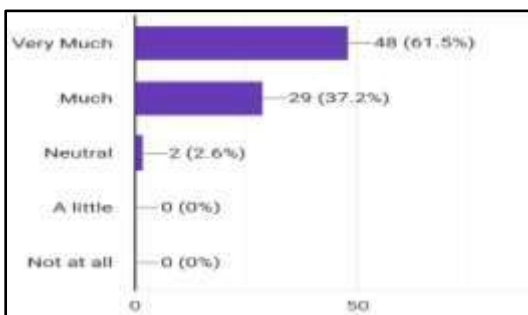
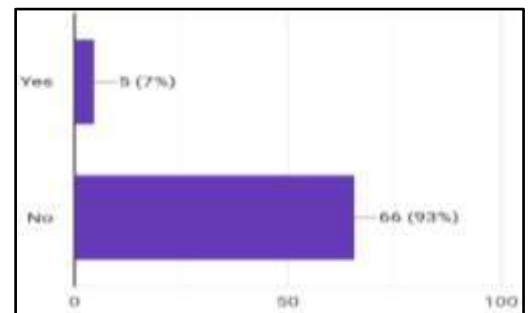
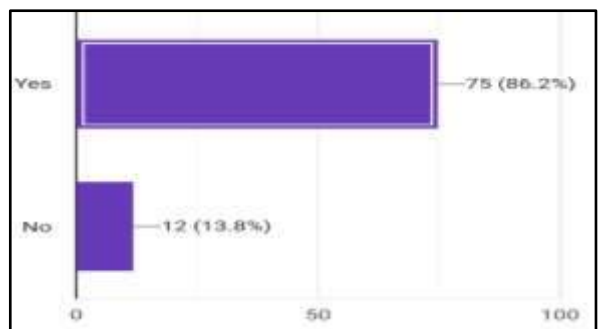


Figure 5 presents the relevance of the degree to the present job of the respondents. Data revealed that 48 (61.5%) claimed it was very much relevant while 29 (37.2%) claimed as were much. Further, the least number of graduates obtained 2 (2.6%) as neutral. However, the study of Balingbing (2014) yielded an interesting low unemployment rate with only 2.60% (or 4 out of 155 respondents). By which, 61.5% (or 48 out of 87) believed that their first job is related to the program (BSOA) they took up in college.

Employment Profile and Features of the Graduate-Respondent

Figure 5 shows the employment rate of the respondents. Majority of them with 75 (86.2%) were employed while 12 (13.8%) were not employed. This percentage of employability is even higher compared with the findings in the study of Del Rosario (2019) which reported 68% employability rate. The result in this study in terms of the percentage of employability is almost the same as in the study of Billo et al. (2017) which is 82.05% (or 96 out of 117). This implies that the graduates can contribute to the growth of national and local economy as depicted on their employability.



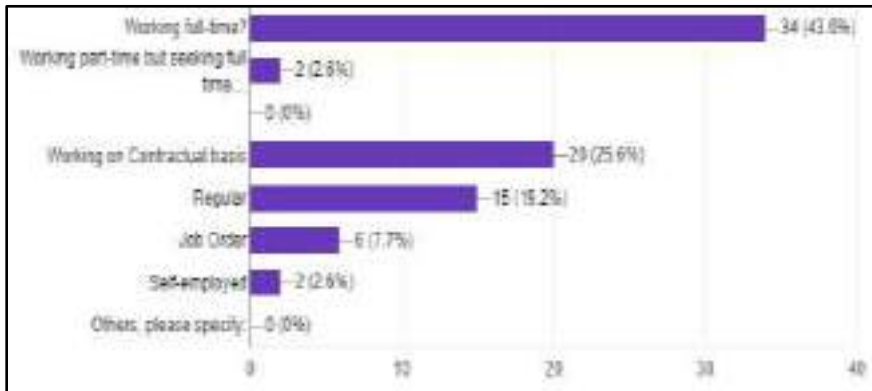


Figure 6 presents the percentage of employment status of the respondents. There were 34 (43.6%) working full-time and 2 (2.6%) working part-time, while 20 (25.6%) were working on contractual basis and 15 (19.2%) as regular. Further, there were 6 (7.7%) working under job order and 2 (2.6%) were self-employed. Most of the respondents in this study (43.6% or 34 out of 87) are working full time. This is a good development in the graduates' career since they have already obtained security of tenure. The study of Woya (2019) recorded a much higher percentage of respondents with permanent employment status

which is 65.8% (or 52 out of 79) among statistics graduates from year 2012-2016 at Bahir Dar University in Ethiopia.

Figure 7 presents the monthly salary of the respondents on their first job. Almost 47 (60.3%) of employed graduates earning 1,000.00 – 10,000.00 a month while 30 (38.5%) of them are receiving 11,000.00-20,000.00. However, the least group of graduates are earning 21,000.00-30,000.00 monthly with 1 (1.3%). As the result said, most of the respondents (60.3% or 47 out of 87) are earning P1,000 to P10,000 per month. This finding is similar from the study of Billo et al. (2017) which found that most of the respondents (52.08%) were earning P5,001 to P10,000. This implies that the monthly yearning of graduates is increasing over the years as they started their job.

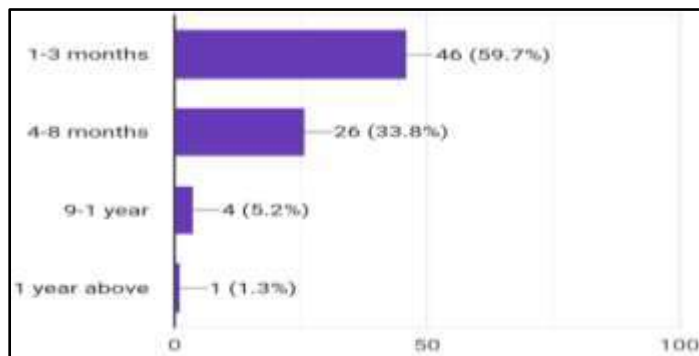
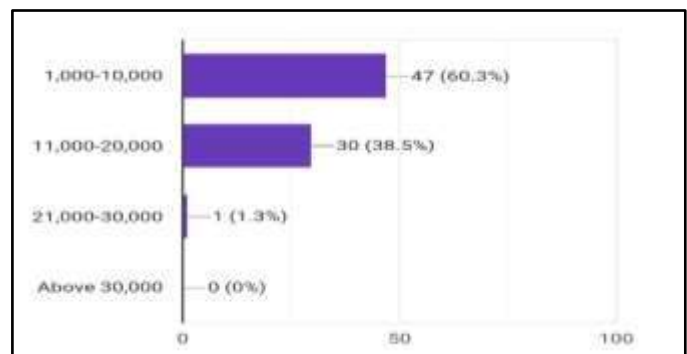
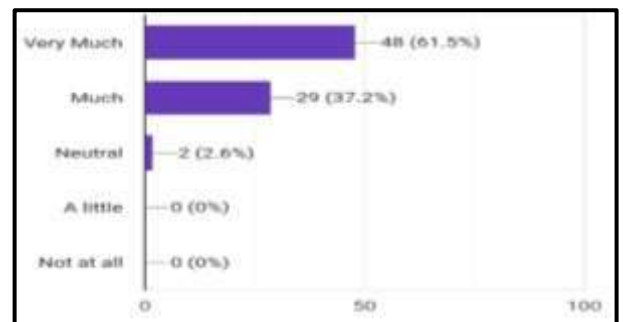


Figure 8 shows the period of seeking their first job. Data revealed that majority of the respondents with 46 (59.7%) found their present job in 1-3 months after graduation followed by 26 (33.8%) with 4-8 months. There were 4 (5.2%) of them reached 9-1 year and 1 (1.3%) for 1 year and above before they landed their first job. This finding is synonymous to the study of Billo et al. (2017) which found out that it took less than one month for most of the respondents (48.95%) to land in their first job. However, this present study does not argue whether the respondents' first job is related to the program they graduated in. This is something that future studies may consider including on their future research.

Figure 9 presents the relevance of the degree to the present job of the respondents. Most of them claimed it was very much relevant with 48 (61.5%) while 29 (37.2%) as much. The least number of graduates obtained 2 (2.6%) as neutral. The result in this study lends support to the idea that competitive graduates in the job market often depend on a strong curriculum of the programs (Ahmed et al., 2012). It goes beyond telling that the curriculum must be relevant in relation to the demands of the industry, because impractical university curriculum is one of the factors like constant changes in the labor market, and students' passivity in planning and developing career (Tran, 2018).



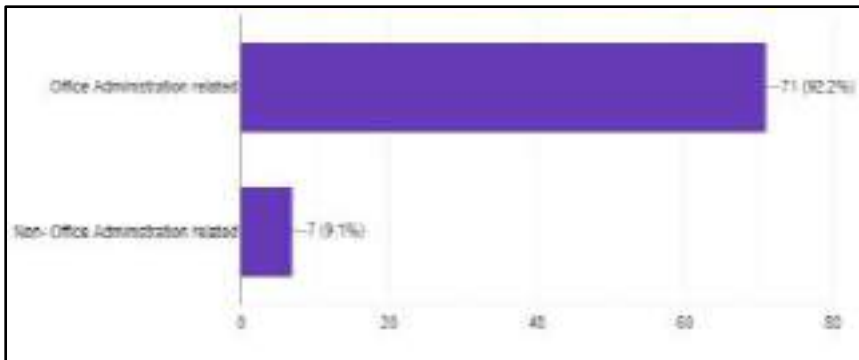


Figure 10 presents that among the 87 graduates, majority of the them with 71 (92.2%) work that is related to office administration while the remaining 7 (9.1%) work with non-office administration related.

Level of the graduates-respondent self-rated evaluation in terms of attitude to work

The results presented in Table 1 were the mean scores of the respondents' response on their status of the level of their self-rated evaluation in terms of their attitude to work. The data revealed that the highest mean score was obtained by item no. 7, *I have a good relationship with my colleagues and co-employees*, with a mean of 4.71 and had the descriptive

equivalent as very high. This means that the item was always manifested by the graduates as such having good relationship to their colleagues and co-employees. On the other hand, item no. 4, *I arrived on time to prepare my work and extend working hours if necessary*, got the lowest mean of 3.56 and had the descriptive equivalent as high. This implies that the item was seldom manifested or practiced. It further means that some of the graduates are not extending working hours as it is part of their duties and responsibilities. This aligns to the proposition

Table 1.
Level of the graduates-respondent self-rated evaluation in terms of attitude to work.

ATTITUDE TO WORK	MEAN	DESCRIPTION
1. I am very interested, happy and satisfied with my work and it is very important for me.	4.4	High
2. I like the kind of job and work I am doing.	4.47	Very High
3. I accepted assignments and tasks given to me at work without complaints.	3.69	High
4. I arrived on time to prepare my work and extend working hours if necessary.	3.56	High
5. I can work better and functional under different working environment and situations.	4.12	High
6. I participated in all activities and events inside my workplace.	4.44	Very High
7. I have a good relationship with my colleagues and co-employees.	4.71	Very High
8. I submitted necessary documents and papers on time and beat deadlines.	4.5	High
9. I performed my task and job with excellence and outstanding quality.	4.39	Very High
10. I seek assistance and help from others whenever I have clarifications and queries.	4.47	Very High
Total	4.28	Very High

highlighting that attitude to work is the map of the employees that allow them to adjust, navigate, and behave appropriately to their environment and various situations (Angeles & Llanto, 2014). Similarly, a study emphasized that work attitude has been found to have a significant effect on employee outcomes including performance, tardiness, absenteeism, turn-over, and working environment (Harrison et al, 2006; Garner and Hunter, 2011). Attitudes and values can vary depending on the environment, roles of an employee, and may also be a result of age and length of tenure (Chiu, Chang, & Wei. 2016).

Level of the graduates-respondent self-rated evaluation in terms of Quality of Education Provision

The result presented in Table 3 are the mean scores of the respondents' response on their status in terms of quality of education provision. The data showed that the highest mean was obtained from item no. 8, *well-trained and self-renewing Faculty members and staffs*, garnering the mean score of 5 and had the descriptive equivalent as very high. This means that statement is always manifested by the graduates emphasizing that the faculty members and staffs are well-trained and self-renewing.



Table 2.

Level of the graduates-respondent self-rated evaluation in terms of Quality of Education Provision		
QUALITY OF EDUCATION PROVISION	MEAN	DESCRIPTION
1. Availability of course materials and different learning resources and learning process.	4.3	High
2. Quality of course contents from courses offered as well as the teaching and learning process.	4.41	Very High
3. Conduciveness of the learning environment and atmosphere.	4.32	Very High
4. Provision of quality practicum guidelines and activities that develops more my skills and abilities from different industry partners and linkages.	4.39	Very High
5. Quality of learning facilities for first-hand and direct experiences like of different laboratories.	4.29	Very High
6. Quality of different courses offered in the program that develops the total sum of the student skills.	4.4	High
7. Level of optimum interaction and contact with my fellow students through different in-campus activities.	4.37	Very High
8. Well-trained and self-renewing Faculty members and staffs.	5	Very High
9. Different trainings, seminars and workshops that prepare students for employment	4.58	Very High
10. Varied learning assessments and instructions which assess students' progress and learning fairly and equality	4.41	Very High
Total	4.52	Very High

Further, *availability of course materials and different learning resources and learning process* in item no. 1 got the lowest mean score of 4.3 and obtained a descriptive equivalent as High. This implies that the learning resources needed for studies is important to provide quality of education among the students. Lastly, the level of the graduates-respondent self-rated evaluation in terms of quality of education provision had the total mean score of 4.52 with a description as very high. This means that awareness of the graduates in their quality of education provision is always manifested. This finding is parallel to the study which emphasized that quality education can be measured from four perspectives including the stakeholders' perceptions, quantifiable elements, course design elements, and external standards (Mitchell, 2016). Also, quality education and sustainable development has significant relationship since study found that there is strong relationship between Quality Education and Sustainable Development Goals (Allam, 2019).

Level of the graduates-respondent self-rated evaluation in terms of Skills and Abilities

The results presented in Table 3 were the mean scores of the respondents' response on their skills and abilities. The data revealed that the highest mean score was obtained from item no. 13, *knowledge with the different office-related works methodologies, techniques, and approaches*, garnering 4.51 and had a descriptive equivalent as very high. This means that the item was always manifested by the graduates and majority of them has the knowledge with office works. Furthermore, item no. 9, *technical and entrepreneurial skills*, got the lowest mean score of 4.03 and had the equivalent as high. This implies that the item was oftentimes manifested. The level of the graduates-respondent self-rated evaluation in terms of skills and abilities had a total mean score of 4.36 with a description as very high. This implies that the level of graduates indicated to skills and abilities is always manifested.

Table 3.
of the graduates-respondent self-rated evaluation in terms of Skills and Abilities.

SKILLS AND ABILITIES	MEAN	DESCRIPTION
1. Organizational and leadership skill	4.4	High
2. Problem solving and critical thinking skills.	4.35	Very High
3. Ability to work independently as well as teamwork and team play.	4.47	Very High
4. Creative thinking and creativity, initiative and taking a risk if necessary.	4.44	Very High
5. Time Management and decision-making skills.	4.4	High
6. Writing competence and skills including technical writing.	4.26	Very High
7. Communication and interpersonal skills.	4.44	Very High
8. Computer and ICT skills	4.29	Very High



9. Technical and Entrepreneurial Skills	4.03	High
10. Ability to work under pressure	4.41	Very High
11. Ability to write the essentials and basics communication skills.	4.31	Very High
12. Code of Ethics applied to my job or work.	4.45	Very High
13. Knowledge with the different office-related works methodologies, techniques, and approaches.	4.51	Very High
14. Expertise about multidisciplinary research that is essential for understanding the needs and interests of the clientele.	4.38	Very High
15. Trainings, seminars, and workshops about the preparation and evaluation of different office procedure.	4.34	Very High
TOTAL	4.36	Very High

This finding was supported by Cederquist et al. (2022) which they mentioned that in any field, but particularly in information systems and office-related fields, lifelong learning is crucial. Graduating students should be taught how to become lifelong and independent learners to become efficient on their job. Further, a study of Wogboroma and Joy (2021) assessed the degree to which office administration students had learned the skills necessary for self-sustainability. The study concluded and showed that office administration students must develop a passable level of self-sustainability skills as it is needed in landing a job after graduation. Lastly, a study by Cuseo (2019) discovered that expertise and adapting skills, such as technical skills, were critical for an office administrator to perform effectively and efficiently. Expertise in pertinent fields was required of the administrators, and success in the administrative capacity required both leadership and administrative abilities. Hence, the success of office administration students in the classroom could be compared to the accomplishments of administrators.

CONCLUSIONS

Graduate tracer studies are very important as a way of understanding the relevance and quality of programs offered by the higher education institutions as well as the labor market. This tracer study aimed to determine the employment rate and employability status of Bachelor of Science in Office Administration graduates from A.Y. 2018 to 2019. A total of 87 graduates were surveyed. Most of the respondents were female and 95.4% were single. Majority of the respondents were graduated at A.Y 2019. Results of the study revealed that all the graduate respondents of BS in Office Administration did not pursue higher education after finishing their BSOA degree.

In terms of employability rate of the graduates, more than half of them got employed with 1 to 3 months after graduation. Majority of them were working as full-time employee in their present job. While almost 47 (60.3%) of employed graduates earning 1,000.00 – 10,000.00 a month. Further, graduates found majority of the course contents of their program relevant to their career requirements. It is a good indication that graduates of Office Administration program become part of the labor market which is one of the major components of the economy. Findings of study also concluded that office administration graduates are willing to learn more and open to development opportunities that can improve their professional career and be better members of the organizations.

RECOMMENDATIONS

Based on the foregoing findings and discussions, the following recommendations are being proposed:

1. The graduating students must be provided with more pre-employment activities or programs that will strengthen their capability of passing employment requirements. This will allow them as well as to what are the key components they need to prepare whenever they will be applying for a job in the future.

2. Office Administration graduates must be encouraged to take further studies after graduation. They may also be encouraged to invest in their professional development through attending more training programs and seminars, join various professional organizations, and build connections. With this observed, this will enable them of upgrading their credentials making them be more open with different opportunities related to their degree.

3. In terms of job awareness and employment, the career and counseling office should keep on holding job fairs and extensive seminars, trainings, and lectures for the graduating Office Administration students. More companies must be invited to participate in the job fairs as suggested also by the graduates.

4. Follow-up studies must be conducted that aim to explore the performance of the BSOA graduates in their workplace. Specifically, a research study can be done involving the present employers of the graduates to assess skills needed by their employees. This can help the Institution align the course design based on the specific needs of the industry. This will also further strengthen the findings of this research.

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APPENDIX GRADUATE TRACER QUESTIONNAIRE

Dear Graduate,

The _____ (Name of School) is on its aim to advance and upgrade its continuous offering for quality education. In line with this, the school will be conducting a tracer study to check the employment status and rate of the graduates, their attitude towards their work as well as their self-evaluation for the quality education provision of the school. Consequently, the purpose of this tracer study is for the institution to check the efficacy and efficiency of its quality education based from the employment status of its graduate. Further, result of the study will be beneficial as it will find a way to establish, revise and improve the institution's curriculum and offering of quality education with its students.

We are hoping and looking forward for your positive response. Thank you for your cooperation. Keep safe always.

A. DEMOGRAPHIC PROFILE

- | | |
|----------------------------------|------------------------------------|
| 1. Name: | 2. Year Graduated: |
| 3. Age: | 4. Sex: |
| 5. Civil Status: | 6. Religion: |
| <input type="checkbox"/> Single | <input type="checkbox"/> Separated |
| <input type="checkbox"/> Married | <input type="checkbox"/> Widowed |

B. EDUCATION

7. Vocational:
8. Degree Completed:
9. Specialization (If any):
10. Do you obtained/earned any other baccalaureate degree? Yes No



11. If yes, please give details below:

Degree Obtained	Institution	Period Enrolled	Source of Funding

12. Do you have already a degree for further studies or currently undertaking?

Yes No

13. If yes, please give details as follows:

Title of Degree (in full)	Institution (s)	Period Enrolled	Source of Funding

C. EMPLOYMENT

14. Are you currently employed?

Yes No

15. If no, skip question 15-22. If employed, please give and complete the details below:

Company Name and Address	Period Employed	Position

16. Indicate the nature of your job?

Teaching
 Non-teaching

17. If non-teaching, please select options below or specify:

Government Agency Office-based Clerk
 Sales Agent/Specialist/Rep. Domestic Helper
 Account Specialist Call Center Agent
 Marketing Specialist Others, *please specify*: _____
 Technician

18. What is your current employment status?

Working full-time
 Working part-time but seeking full-time work
 Working part-time but not seeking full-time work
 Working on Contractual basis
 Regular
 Job Order
 Self-employed.
 Others, please specify: _____

19. For you, how relevant is your college degree to your present job right now?

Very much Much Neutral Little No all

20. How long did it take for you to find employment after graduation?

1-3 months 4-8 months 9-1 year 1 year above.

21. How much is your gross monthly salary?

1,000-10,000 11,000-20,000 21,000 30,000 Above 30 00

22. Do you intend to upgrade your qualification in the future?

Yes No



Direction: Please rate honestly the different statements or constructs in the table below based on your attitude towards your work and the workplace. Then, refer to the guidelines below as you complete and choose your respective responses.

Strongly Agree (5): If you always manifest the said construct or statement.
Agree (4): If you often manifest the said construct or statement.
Neither (3): If you sometimes manifest the said construct or statement.
Disagree (2): If you seldom manifest the said construct or statement.
Strongly Disagree (1): If you rarely manifest the said construct or statement.

	Attitude to Work	5	4	3	2	1
1.	I am very interested, happy and satisfied with my work and it is very important for me.					
2.	I like the kind of job and work I am doing.					
3.	I accepted assignments and tasks given to me at work without complaints.					
4.	I arrived on time to prepare my work and extend working hours if necessary.					
5.	I can work better and functional under different working environment and situations.					
6.	I participated in all activities and events inside my workplace					
7.	I have a good relationship with my colleagues and co-employees.					
8.	I submitted necessary documents and papers on time and beat deadlines.					
9.	I performed my task and job with excellence and outstanding quality.					
10.	I seek assistance and help from others whenever I have clarifications and queries.					

Direction: Please rate honestly the different qualities or constructs in the table below based on your experiences as you studied and stayed in _____. Then, refer to the guidelines below as you complete and choose your respective responses.

Very Good (5): If the said quality or construct is always tangible and manifested.
Good (4): If the said quality or construct is often tangible and manifested.
Fair (3): If the said quality or construct is sometimes tangible and manifested.
Poor (2): If the said quality or construct is seldom tangible and manifested.
Very Poor (1): If the said quality or construct is rarely tangible and manifested.

	Quality of Education Provision	5	4	3	2	1
<i>As I studied in _____, there was...</i>						
1.	Availability of course materials and different learning resources needed for our studies.					
2.	Quality of course contents from courses offered as well as the teaching and learning process.					
3.	Conduciveness of the learning environment and atmosphere.					
4.	Provision of quality practicum guidelines and activities that develops more my skills and abilities from different industry partners and linkages.					
5.	Quality of learning facilities for first-hand and direct experiences like of different laboratories.					



6.	Quality of different courses offered in the program that develops the total sum of the student skills.					
7.	Level of optimum interaction and contact with my fellow students through different in-campus activities.					
8.	Well-trained and self-renewing Faculty members and staffs.					
9.	Different trainings, seminars and workshops that prepare students for employment.					
10.	Varied learning assessments and instructions which assess students' progress and learning fairly and equally.					

Direction: Please rate honestly the different skills and abilities in the table below based on your completed programme or degree. Then, refer to the guidelines below as you complete and choose your respective responses.

Very High (5): If the said skill or ability is always observed and manifested.
High (4): If the said skill or ability is oftentimes observe and manifested.
Fair (3): If the said skill or ability is sometimes observed and manifested.
Low (2): If the said skill or ability is seldom observed and manifested.
Very Low (1): If the said skill or ability is rarely observed and manifested.

Skills and Abilities		5	4	3	2	1
<i>As I studied in _____, it developed and enhanced my ...</i>						
1.	Organizational and leadership skill.					
2.	Problem solving and critical thinking skills					
3.	Ability to work independently as well as team work and team play.					
4.	Creative thinking and creativity, initiative and taking a risk if necessary.					
5.	Time Management and decision-making skills.					
6.	Writing competence and skills including technical writing.					
7.	Communication and interpersonal skills.					
8.	Computer and ICT Skills					
9.	Technical and Entrepreneurial Skills					
10.	Ability to work under pressure.					
11.	Ability to write the essentials and basics of effective lesson planning.					
12.	Code of ethics applied to my teaching profession.					
13.	Knowledge with the different teaching methodologies, techniques and approaches through seminars and workshops.					
14.	Expertise about multidisciplinary research that is essential for understanding students' needs and interests.					
15.	Trainings, seminars and workshops about the preparation and evaluation of different instructional materials.					

Adopted from: Escandallo, J. (2024). A Tracer Study on the Elementary Education Graduates from Academic Year 2015 to 2019: Employment in Focus. *EPRA International Journal of Multidisciplinary Research (IJMR)*, 1 (10), 2024, 474-483.



CREDIT CARD FRAUD DETECTION USING MACHINE LEARNING ALGORITHMS

K.Kowsalya¹, Mrs.Vasumathi², Dr.S.Selvakani³

¹PG Scholar, PG Department of Computer Science, Government Arts and Science College, Arakkonam, Tamilnadu, India

²Assistant Professor, PG Department of Computer Science, Government Arts and Science College, Arakkonam, Tamilnadu, India

³Assistant Professor and Head, PG Department of Computer Science, Government Arts and Science College, Arakkonam, Tamilnadu, India

Article DOI: <https://doi.org/10.36713/epra16045>

DOI No: 10.36713/epra16045

ABSTRACT

The Credit card frauds represent facile and amiable targets, particularly as the proliferation of e-commerce and various online platforms has led to a commensurate expansion in online payment modalities, thereby augmenting the susceptibility to online fraudulent activities. In response to the escalating rates of fraudulent incidents, researchers have undertaken the utilization of diverse machine learning methodologies to ascertain and scrutinize frauds within the realm of online transactions.

The primary objective of this scholarly endeavor is to formulate and advance an innovative fraud detection *modus operandi* tailored for Streaming Transaction Data. The overarching goal is to meticulously scrutinize the historical transaction particulars of patrons and distill discernible behavioral patterns. This involves the clustering of cardholders into disparate cohorts predicated upon their transactional magnitudes. Subsequently, a sliding window strategy is employed to amalgamate transactions conducted by cardholders across distinct groups, facilitating the extraction of their respective behavioral patterns.

Consecutively, diverse classifiers trained on these distinct groups, and the classifier exhibiting superior rating scores is earmarked as one of the preeminent methods for prognosticating fraudulent activities. This is succeeded by the implementation of a feedback mechanism aimed at mitigating the challenges posed by the phenomenon of concept drift. The empirical investigation detailed in this paper is grounded in the analysis of a European credit card fraud dataset.

It is imperative for credit card companies to adeptly discern instances of fraudulent credit card transactions to preclude customers from incurring charges for items they did not legitimately acquire. The resolution to such quandaries lies in the realm of Data Science, a discipline whose significance, when coupled with Machine Learning, is of paramount importance. This undertaking endeavors to elucidate the construction of a model utilizing machine learning techniques for Credit Card Fraud Detection.

The Credit Card Fraud Detection Problem entails the modeling of historical credit card transactions, incorporating data from those that transpired as fraudulent. Subsequently, this model is employed to ascertain the veracity of new transactions, distinguishing between fraudulent and non-fraudulent activities. The primary aim is the meticulous detection of 100% of fraudulent transactions, while concurrently minimizing instances of erroneous classifications of non-fraudulent transactions. Credit Card Fraud Detection serves as a quintessential exemplar of classification challenges.

In the course of this endeavor, significant emphasis has been placed on the analysis and pre-processing of datasets. Furthermore, a diverse array of anomaly detection algorithms, including the Local Outlier Factor and Isolation Forest algorithm, have been deployed on Principal Component Analysis (PCA) transformed Credit Card Transaction data.

KEYWORDS: Card-Not-Present frauds, Card-Present-Frauds, Concept Drift,,Credit card fraud, applications of machine learning, data science.

1. INTRODUCTION

The A credit card, in general parlance, denotes a card designated for a customer (cardholder), typically conferring the privilege to procure goods and services within a predetermined credit limit or effect cash withdrawals in advance. This financial instrument affords the cardholder a temporal advantage, affording them the facility to settle their financial obligations in a subsequent billing cycle.

The vulnerability of credit cards to fraudulent activities renders them susceptible targets. Unencumbered by risks, malefactors

can expeditiously withdraw a substantial sum without the card owner's cognizance within a concise timeframe. The perennial quest of fraudsters is to obfuscate each illicit transaction, rendering fraud detection an arduous and intricate endeavor.

In the annals of 2017, a lamentable total of 1,579 data breaches transpired, encompassing nearly 179 million records. Notably, credit card frauds emerged as the most prevalent manifestation, accounting for 133,015 reported incidents. Subsequent in frequency were employment or tax-related frauds with 82,051 instances, phone frauds with 55,045 occurrences, and bank



frauds with 50,517 reports, as per statistics disseminated by the Federal Trade Commission.

In recent years, a spectrum of frauds, predominantly manifesting as credit card frauds, has consistently pervaded news cycles, occupying a prominent position in the collective consciousness of the global populace. The credit card dataset, a repository of financial transactions, is marked by a conspicuous imbalance, wherein the frequency of legitimate transactions significantly eclipses that of fraudulent ones.

As a progressive measure, financial institutions are transitioning towards the adoption of EMV (Europay, Mastercard, Visa) cards, sophisticated smart cards that securely store data on integrated circuits, diverging from the conventional magnetic stripe storage mechanism. While these advancements have fortified the security of on-card payments, they have not mitigated the elevated prevalence of card-not-present (CNP) frauds.

According to the 2017 report from the US Payments Forum, a notable realignment in criminal endeavors has materialized, with malefactors redirecting their focus towards activities associated with CNP transactions. This shift is concurrent with the fortification of security measures implemented for chip cards. The graphical representation in Figure 2 delineates the escalating instances of CNP fraud cases documented in the respective years, providing a visual testament to the evolving landscape of financial malfeasance.

Fraud within the realm of credit card transactions denotes the unauthorized and undesired utilization of an account by an individual other than the lawful owner of said account. Prudent measures for prevention can be instituted to thwart such malfeasance, accompanied by a meticulous examination of the behavioral patterns inherent in fraudulent practices. This analytical endeavor serves to minimize the occurrence of fraud and fortify defenses against potential recurrences.

In essence, Credit Card Fraud transpires when an individual employs another person's credit card for personal purposes, unbeknownst to both the cardholder and the card-issuing authorities. The surreptitious utilization of the card remains concealed, exacerbating the challenge of identifying and curbing such illicit activities.

The domain of fraud detection necessitates the vigilant surveillance of user populations, aiming to ascertain, discern, or preclude objectionable behaviors encompassing fraud, intrusion, and defaults.

This predicament assumes particular salience, warranting the concerted attention of communities steeped in machine learning and data science. The resolution of this issue can be automated through the sophisticated application of these disciplines.

Notably, this predicament presents a formidable challenge in the arena of learning, characterized by intricate factors such as class imbalance. The preponderance of valid transactions significantly surpasses their fraudulent counterparts. Additionally, the temporal evolution of transaction patterns

introduces a dynamic dimension, wherein the statistical properties of transactions metamorphose over time, further complicating the discernment and classification processes.

In contemporary times, the proliferation of credit card usage on a global scale signifies a pronounced shift toward a cashless paradigm, with individuals increasingly reliant on online transactions for financial dealings. The advent of credit cards has significantly streamlined digital transactions, rendering them more facile and accessible. The substantial financial losses incurred annually due to criminal credit card transactions underscore the pervasive nature of fraud, an ancient human predicament manifesting in multifarious forms.

The 2017 PwC global economic crime survey reveals that approximately 48% of organizations grappled with instances of economic crime. Consequently, there exists an imperious need to unravel the intricacies of credit card fraud detection. The burgeoning landscape of new technologies presents additional avenues for malefactors to orchestrate fraudulent schemes. The predominant use of credit cards in contemporary society has led to an alarming escalation in credit card fraud in recent years, imposing significant financial repercussions not only on merchants and financial institutions but also on individual credit cardholders.

Beyond monetary losses, fraud has the potential to tarnish the reputation and image of merchants, resulting in non-financial detriments. For instance, a cardholder victimized by fraud with a specific company may lose trust in their business, opting to patronize a competitor. Fraud detection encompasses the meticulous monitoring of the transactional behavior of cardholders to discern and preclude potentially illicit activities.

In a meticulously orchestrated system, we employ the random forest algorithm for the classification of credit card datasets. Random Forest, an algorithm for both classification and regression, constitutes an amalgamation of decision tree classifiers. Distinguishing itself from the conventional decision tree, the random forest mitigates the tendency to over fit to the training set. Each individual tree is trained on a randomly sampled subset of the training set, and subsequently, a decision tree is constructed, with each node splitting on a feature selected from a random subset of the complete feature set.

The random forest algorithm demonstrates expeditious training, even with large datasets replete with numerous features and data instances. Its independence in the training of each tree contributes to resilience against overfitting. Consequently, the Random Forest algorithm emerges as a robust tool, providing a reliable estimate of generalization error while resisting the pitfalls of overfitting.

2. RELATED WORK

In many instances of real-time event-driven applications, a pervasive sense of uncertainty prevails. The realm of credit card fraud detection exemplifies such uncertainty, demanding the expeditious identification of potential fraud incidents before a transaction is either approved or denied. To address this inherent uncertainty, we introduce extensions to the IBM Proactive Technology Online



(PROTON) open-source tool. The infusion of uncertainty considerations permeates the architecture and logic of an event processing engine at all levels. These extensions to PROTON encompass the integration of novel built-in attributes and functions, provision for diverse operand types, and the incorporation of event processing patterns to effectively navigate this uncertainty. The introduced capabilities, implemented as fundamental building blocks and primitives in the complex event processing programmatic language, empower the generic implementation of event-driven applications featuring uncertainty aspects across diverse domains. An initial application in the realm of credit card fraud detection demonstrates promising preliminary results, underscoring the potential advantages derived from incorporating uncertainty considerations within this domain [5]. (Author: Fabiana Fournier, Ivo Carreia, Inna Skarbovsky).

Fraud, an insidious activity designed to inflict financial harm on others, is on the ascendancy with the increasing prevalence of digital and plastic transactions, even in developing economies. Credit card-related frauds have incurred substantial financial losses globally. Despite the deployment of various countermeasures, fraudsters persistently innovate to devise new strategies. A potent fraud detection system is imperative, not only to identify fraud but also to anticipate and address it with precision. This paper introduces the concept of credit card frauds and delves into various fraud detection techniques, including Support Vector Machine (SVM), Artificial Neural Networks (ANN), Bayesian Network, K-Nearest Neighbor (KNN), Hidden Markov Model, Fuzzy Logic-Based System, and Decision Trees. Through an exhaustive review, we undertake a comparative analysis of existing and proposed models for credit card fraud detection, evaluating them based on quantitative metrics such as accuracy, detection rate, and false alarm rate. Our study concludes by elucidating the limitations of existing models and proposing refined solutions to overcome these shortcomings [9]. (Author: Yashvi Jain, Namrata Tiwari, Shriprya Dubey, Sarika Jain)

A Comprehensive Survey: The ubiquity of credit card usage, both online and offline, has made it a preferred mode of payment, accompanied by a surge in associated fraudulent activities. Despite the myriad techniques developed for fraud detection, instances of credit card fraud continue to escalate, necessitating constant innovation in detection methodologies. This survey delves into various fraud detection techniques grounded in Artificial Intelligence, Fuzzy Logic, Neural Networks, Logistic Regression, Naïve Bayesian, Machine Learning, Sequence Alignment, Decision Tree, Bayesian Network, Meta Learning, Genetic Programming, and more. The paper offers a comprehensive overview of these techniques employed in the detection of diverse credit card fraudulent transactions. Authored by Dinesh L. Talekar and K. P. Adhiya, the survey illuminates the dynamic landscape of credit card fraud detection mechanisms, highlighting the need for ongoing innovation to counter the evolving tactics of fraudsters [3].

Fraud constitutes the illicit or criminal act of intentional deception, orchestrated with the objective of securing financial or personal gain. It represents a willful transgression against established laws, regulations, or policies, undertaken with the aim of illicitly acquiring financial benefits.

Numerous scholarly works concerning anomaly or fraud detection within this sphere have already been disseminated and are readily accessible for public consumption. [8] A thorough examination conducted by Clifton Phua and his associates has unveiled that methodologies prevalent in this realm encompass applications of data mining, automated fraud detection, and adversarial detection. In a separate scholarly contribution, Suman, a Research Scholar affiliated with GJUS&T at Hisar HCE, presented methodologies such as Supervised and Unsupervised Learning for the detection of credit card fraud. Despite the unanticipated success attained in specific domains by these methodologies and algorithms, they have proven inadequate in furnishing a lasting and consistently effective solution to the challenge of fraud detection.

A comparable research domain was delineated by Wen-Fang YU and Na Wang, wherein they applied Outlier mining, Outlier detection mining, and Distance sum algorithms to meticulously prognosticate fraudulent transactions in an emulative experiment involving a credit card transaction dataset from a specific commercial bank. [2] Outlier mining, a facet of data mining predominantly applied in financial and internet domains, is concerned with the identification of entities that deviate from the principal system—specifically, transactions lacking authenticity. The researchers incorporated attributes related to customer behavior, and predicated on the values of these attributes, ascertained the disparity between the observed value and its predetermined counterpart.

Various Supervised machine learning algorithms, such as Decision Trees, Naive Bayes Classification, Least Squares Regression, Logistic Regression, and Support Vector Machines (SVM), are employed for the real-time detection of fraudulent transactions in datasets.

Two methodologies within the realm of random forests [6] are utilized to train the behavioral features associated with normal and abnormal transactions. These methods encompass Random-tree-based random forest and CART-based approaches. Despite the commendable outcomes achieved by random forests with small datasets, challenges persist, particularly when dealing with imbalanced data. Subsequent efforts will be directed towards addressing the aforementioned issue, with a specific focus on enhancing the underlying algorithm of the random forest.

The performance of Logistic Regression, K-Nearest Neighbour, and Naïve Bayes is scrutinized within the context of highly skewed credit card fraud data. Research endeavors also extend to the exploration of meta-classifiers and meta-learning approaches designed to manage highly imbalanced credit card fraud data.

While supervised learning methods may be employed for fraud detection, they may encounter limitations in certain instances. An innovative approach involves the utilization of a deep Auto-encoder and restricted Boltzmann machine (RBM) model [7], adept at formulating normal transactions to discern anomalies within established patterns. Furthermore, a hybrid methodology has been devised, amalgamating Adaboost and Majority Voting methods [7] for enhanced efficacy.

Mobile payment fraud denotes the illicit utilization of mobile transactions, achieved through identity theft or credit card pilferage, with the intention of fraudulently acquiring monetary funds. [10] The swift proliferation of smartphones and online transaction services has exacerbated the incidence of mobile payment fraud, necessitating a precise and efficient detection mechanism. Given the substantial financial ramifications of fraud, an intricately accurate process for mobile payment fraud detection becomes imperative. Accordingly, our proposed approach delineates a comprehensive methodology, integrating machine learning techniques, encompassing both supervised and unsupervised methods, to effectively identify and address fraudulent activities while managing substantial volumes of financial data.

The primary aim of this project is to devise a machine learning model for the identification of fraudulent credit card activities within the realm of online financial

transactions. The manual analysis of counterfeit transactions is deemed impractical due to the enormity and intricacy of the data involved. Nonetheless, by endowing the system with pertinent informative features, [1] the feasibility of leveraging machine learning to address this challenge becomes apparent. The hypothesis posited in this regard will be systematically explored throughout the project.

Model assessment constitutes a crucial facet within the model development continuum, serving as a means to identify the optimal model that accurately encapsulates our dataset and gauges its prospective efficacy. Assessing model proficiency using the dataset employed for training is deemed inadequate in the field of data science, as it can readily engender overly optimistic and excessively tailored models. To circumvent the pitfall of overfitting, [4] evaluation techniques such as holdout and cross-validations are deployed to rigorously assess the model's performance. The outcomes are subsequently portrayed in a visualized format, manifesting as graphs that represent the classified data.

Accuracy, in this context, is precisely defined as the ratio of accurate predictions to the total predictions for the test dataset. This metric is conveniently derived through mathematical computation, involving the division of the number of correct predictions by the overall number predictions made.

3. METHODOLOGY

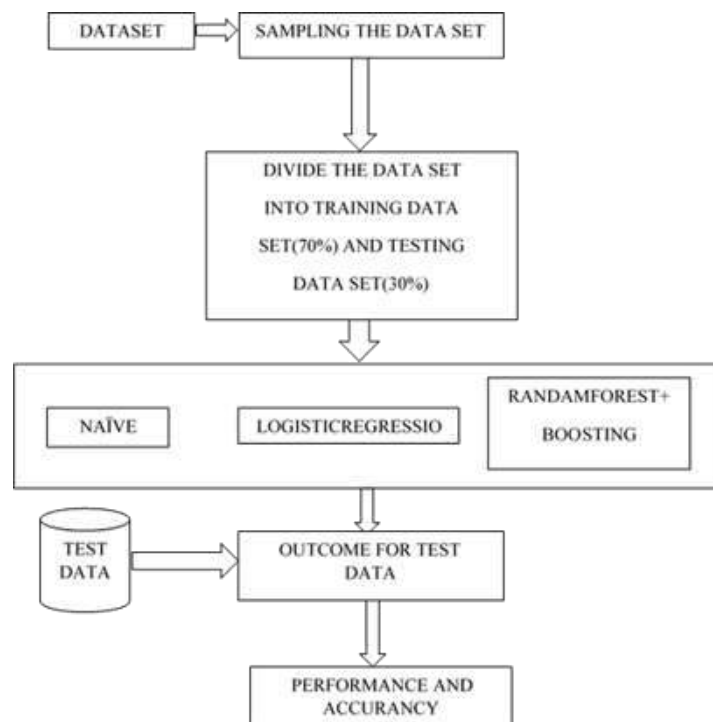


Figure 1. System Architecture



The Dataset: This research leverages the credit card fraud detection dataset available for download on Kaggle. The dataset encapsulates transactions transpiring over two days in September 2013, executed by European cardholders. Comprising 31 numerical features, the dataset necessitated Principal Component Analysis (PCA) transformation for certain financial input variables to maintain data anonymity. Notably, three features remained unaltered. The "Time" feature signifies the temporal interval between the initial transaction and subsequent transactions in the dataset. "Amount" represents the transaction value made by credit card, while "Class" serves as the label, assuming values of 1 for fraudulent transactions and 0 otherwise.

The Sampling: The dataset is further refined to encompass 560 transactions, including 228 classified as fraud and 332 as normal transactions. Subsequently, the dataset is partitioned into a training set (70% of the data) and a test set (30% of the data). Supervised machine learning algorithms, including Naive Bayes, Logistic Regression, and Random Forest with boosting technique, are deployed in this study.

Naïve Bayes

Employing Bayes' theorem, this algorithm calculates the probability of an event occurring given the probability of another event that has already transpired. Recognized for its simplicity

$$P(A/B) = (P(B/A) P(A)) / P(B)$$

Where, P(A) – Priority of A P(B) – Priority of B

P(A/B) – Posteriori priority of B

Logistic Regression:

Similar to the linear regression algorithm, Logistic Regression is tailored for classification tasks. While linear regression forecasts values, Logistic Regression excels in binary and multivariate classification tasks. It accommodates binomial (two possible types), multinomial (three or more possible types not ordered), and ordinal (ordered categories) classifications.

Random Forest

Beginning with the selection of random samples, this algorithm constructs a decision tree for each sample, generating predictions from each. The final prediction results from a voting process, with the most frequently predicted outcome deemed the final prediction.

Ada Boost

A machine learning algorithm developed primarily for binary classification, Ada Boost assigns weights to each instance in the training dataset.

Algorithm steps for finding the Best algorithm

Step 1: Import the dataset into the computational environment.

Step 2: Transform the data into the structured format of data frames.

Step 3: Undertake a process of random sampling on the dataset.

Step 4: Deliberate upon the determination of the data volume allocated for both training and testing phases.

Step 5: Allocate 70% of the dataset for training purposes, reserving the remaining 30% for testing.

Step 6: Confer the training dataset unto the models under consideration.

Step 7: Implement the selected algorithm among the three distinct algorithms, thereby creating the model.

Step 8: Generate predictions for the test dataset using each algorithm.

Step 9: Evaluate the accuracy of each algorithm through the utilization of a confusion matrix.

Test data undergoes the testing phase subsequent to the completion of training on the dataset. The ensuing results for the test data are elucidated for each algorithm, and the performance metrics are visually represented through graphical depictions. The accuracy results culminate in the revelation of the efficacy of each algorithm, thereby facilitating the identification of the most optimal algorithm within the context. The evaluation process entails a diverse array of metrics tailored for different algorithms. These metrics have been meticulously devised to assess disparate facets. As such, they serve as the benchmarks for the appraisal of various proposed methodologies. Notably, the metrics of False Positive (FP), False Negative (FN), True Positive (TP), True Negative (TN), and the interrelation among them are parameters consistently embraced by researchers in the realm of credit card fraud detection. These metrics are instrumental in comparing the accuracy of diverse approaches.

The Elucidation of the mentioned parameters is delineated below

True Positive (TP): The true positive rate encapsulates the proportion of fraudulent transactions accurately identified as such.

$$\text{- True positive} = TP / (TP + FN)$$

True Negative (TN):The true negative rate encapsulates the proportion of normal transactions accurately identified as such.

$$\text{- True negative} = TN / (TN + FP)$$

False Positive (FP):The false positive rate delineates the proportion of non-fraudulent transactions erroneously categorized as fraudulent.

$$\text{- False positive} = FP / (FP + TN)$$

False Negative (FN): The false negative rate delineates the proportion of non-fraudulent transactions erroneously categorized as normal.

$$\text{- False negative} = FN / (FN + TP)$$

The Confusion Matrix serves as an invaluable tool offering a more nuanced understanding of a predictive model's performance. It not only reveals the accuracy of the model but also elucidates the correctness of predictions for each class, highlighting both accurate and erroneous classifications. In the context of a binary classification problem, encompassing negative and positive classes, each cell in the matrix assumes a precise and well-defined nomenclature.

Table 1. Table Label

Predicted	Positive	Negative
Positive	TP	FN
Negative	FP	TN

Study Precision and recall: Precision denotes the proportion of positively classified or fraudulent instances that genuinely belong to the positive class. Precision is mathematically

expressed as $Tp / (Tp + Fp)$, where Tp represents true positives and Fp represents false positives. On the other hand, recall serves as a metric quantifying the accurate positive predictions in relation to all potential positive predictions. Unlike precision, which exclusively addresses correct positive predictions within the set of all positive predictions, recall sheds light on missed positive predictions. The recall metric is computed as $Tp / (Tp + Fn)$, where Tp signifies true positives and Fn signifies false negatives.

F1 score: The F1 Score represents the weighted average of Precision and Recall, offering a comprehensive evaluation that incorporates both false positives and false negatives. The formulation for the F1 Score is $2 * (Recall * Precision) / (Recall + Precision)$.

Support: Support, a critical metric in classification, denotes the number of samples within the true response class in the dataset under consideration. Specifically, support reflects the actual occurrences of the class within the specified dataset. Imbalances in support across different classes may unveil structural vulnerabilities in the classifier's reported scores, prompting consideration for stratified sampling or rebalancing strategies. It's noteworthy that support remains constant across models, serving as a diagnostic tool for the evaluation process rather than a variable affected by model variations.

4. EXPERIMENTAL AND RESULT

The following results were observed as the models - logistic regression and random forest with boosting technique were evaluated against the data

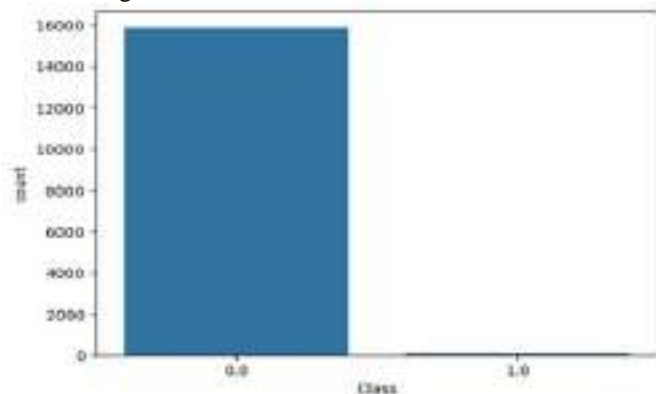


Figure 2. Chart showing results on count plot

	precision	recall	f1-score	support	
	0.0	1.00	1.00	1.00	3176
	1.0	0.50	0.45	0.48	11
Accuracy				1.00	3187
Macro Avg	0.75	0.73	0.74		3187
Weighted Avg	1.00	1.00	1.00		3187

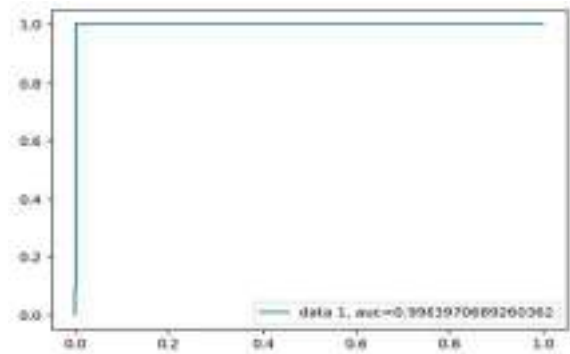


Figure 3. Chart showing results on Logistic Regression

	precision	recall	f1-score	support	
	0.0	1.00	1.00	1.00	3176
	1.0	0.91	0.91	0.91	11

accuracy				1.00	3187
macro avg	0.95	0.95	0.95		3187
weighted avg	1.00	1.00	1.00		3187

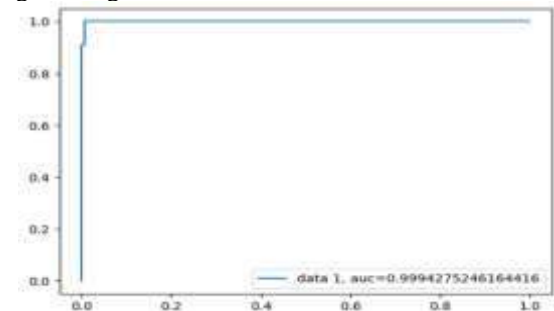


Figure 4. Xgboost classifier

	Precision	recall	f1-score	support	
	0.0	1.00	1.00	1.00	3176
	1.0	0.90	0.82	0.86	11
Accuracy				1.00	3187
Macro avg	0.95	0.91	0.93		3187
Weighted avg	1.00	1.00	1.00		3187

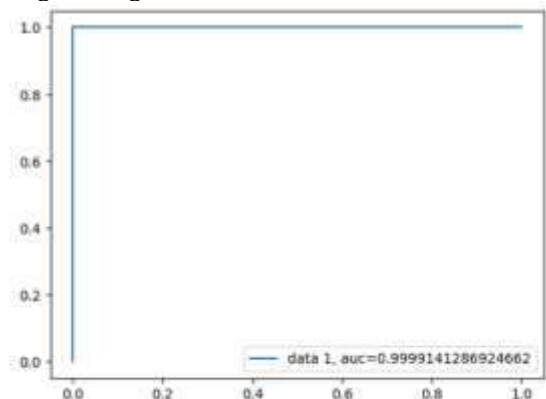


Figure 5. Random Forest Classifier

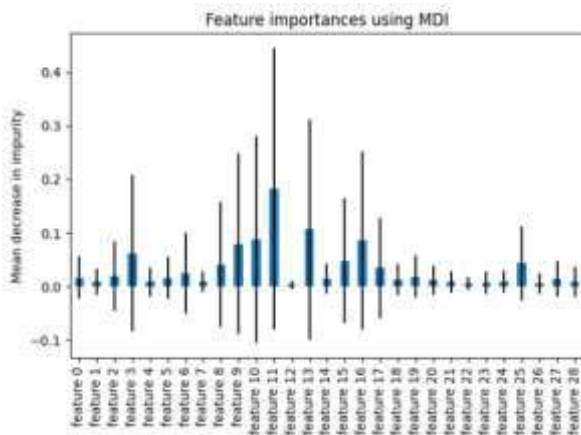


Figure 6. Feature importance using MDI

augmentation necessitates formal endorsement and support from financial institutions.

5. FUTURE WORK

6. CONCLUSION

- Upon scrutinizing the aforesaid comparative analysis delineating diverse credit card fraud detection methodologies, it is evident that the Random Forest augmented with Boosting technique manifests optimal performance within this context. However, it is imperative to acknowledge the limitations inherent in the application of the aforementioned trio of algorithms. Specifically, the inability to ascertain the identities of fraudulent and non-fraudulent transactions within the provided dataset through machine learning is a notable deficiency in the present study. In order to propel the project toward greater refinement, concerted efforts can be directed towards devising solutions to address this quandary through the implementation of diverse methodologies.
- Although our objective of attaining 100% accuracy in fraud detection eludes us, we have successfully crafted a system that, given adequate temporal and data resources, approaches the realization of this aspiration. In the realm of projects of this nature, there exists an inherent potential for refinement.
- The intrinsic structure of this undertaking lends itself to the amalgamation of multiple algorithms as cohesive modules, with their outcomes synergistically contributing to the augmentation of the final result's accuracy. Augmentation of this model can be accomplished by the incorporation of additional algorithms, contingent upon their adherence to the same format as their counterparts. Once this prerequisite is met, the integration of these modules becomes straightforward, as exemplified in the underlying code. This imparts a commendable degree of modularity and adaptability to the overall project.
- Further avenues for refinement lie within the dataset itself. As previously evidenced, the precision of the algorithms experiences amplification with an expanded dataset. Consequently, an influx of additional data is poised to refine the model's accuracy in fraud detection, concurrently mitigating the incidence of false positives. However, such

This paper delves into the applications of machine learning methodologies such as Naïve Bayes, Logistic Regression, and Random Forest with Boosting, demonstrating their efficacy in accurately discerning fraudulent transactions while concurrently mitigating the incidence of false alerts. A noteworthy contribution of this study lies in the novel application domain of supervised learning algorithms, particularly in the context of bank credit card fraud detection systems. The utilization of these algorithms facilitates the timely prediction of potential fraud transactions immediately following credit card transactions, enabling the implementation of a series of anti-fraud strategies to safeguard financial institutions against substantial losses and minimize risks.

The study deviates from conventional classification problems by incorporating a variable misclassification cost as a distinctive objective. Evaluation metrics such as Precision, Recall, F1-score, Support, and Accuracy serve as benchmarks for assessing the performance of the proposed system. Through a comprehensive comparative analysis of the three methodologies employed, it is discerned that the Random Forest Classifier with Boosting technique surpasses the efficacy of Logistic Regression and Naïve Bayes methods.

Thus, we have attained a precision of credit card fraud detection, denoted by the accurate value of 0.9994802867383512 (99.93%), employing an optimized Random Forest algorithm with innovative enhancements. In contrast to extant modules, this proposed module exhibits adaptability to larger datasets and yields superior accuracy in its outcomes. While the Random Forest algorithm demonstrates heightened performance with an ample corpus of training data, its efficiency during testing and application phases is, however, compromised. The integration of additional pre-processing techniques holds the potential to ameliorate these limitations. Our prospective endeavors will endeavor to encapsulate these advancements into a software application, leveraging avant-garde technologies such as Machine Learning, Artificial Intelligence, and Deep Learning to proffer a comprehensive solution for credit card fraud detection.

Credit card fraud, an indisputable manifestation of criminal dishonesty, has been scrutinized in this article, elucidating the prevalent fraudulent methodologies and their corresponding detection techniques. Recent advancements in this domain have been meticulously reviewed. The exposition further delves into the application of machine learning as a potent tool for enhancing fraud detection efficacy. It expounds upon the algorithmic intricacies, provides pseudocode, elucidates its implementation, and meticulously delineates the results of experimental endeavors.



While the algorithm attains a commendable accuracy exceeding 99.6%, its precision remains somewhat constrained, registering at 28% when a tenth of the dataset is considered. However, a noteworthy improvement is observed when the algorithm processes the entire dataset, yielding a precision of 33%. This discrepancy can be attributed to the substantial imbalance between the volume of valid and fraudulent transactions within the dataset.

Given the limited temporal scope of the dataset, spanning only two days' transaction records, it represents but a fraction of the expansive data that could be available for commercial-scale deployment of this project. Grounded in machine learning algorithms, the program is poised to augment its efficiency incrementally with the influx of additional data over time.

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BRIDGING HERITAGE: A COMPARATIVE ANALYSIS OF TOURISM DEVELOPMENT AT BUDDHIST PILGRIMAGE SITES IN UTTAR PRADESH AND BIHAR

Shushant Kumar Kushwaha

Research Scholar, Department of History of Art, Faculty of Arts, Banaras Hindu University

Article DOI: <https://doi.org/10.36713/epra16021>

DOI No: 10.36713/epra16021

ABSTRACT

This empirical research paper undertakes a comparative examination of tourism development at Buddhist pilgrimage sites in Uttar Pradesh (UP) and Bihar, two Indian states steeped in historical and cultural significance within Buddhism. The study aims to assess and contrast the tourism infrastructure, visitor experiences, and socio-economic impacts of tourism development across selected Buddhist pilgrimage sites in both regions. Employing a mixed-methods approach comprising surveys, interviews, and site observations, this research offers a comprehensive analysis of the strengths, weaknesses, opportunities, and challenges associated with tourism development in UP and Bihar. By identifying noteworthy practices and areas necessitating improvement, the paper furnishes practical recommendations aimed at fostering the sustainable advancement of Buddhist pilgrimage tourism in both states.

Buddhist pilgrimage sites in UP and Bihar attract pilgrims and tourists from diverse cultural backgrounds, seeking spiritual enlightenment and historical insight. However, disparities in tourism infrastructure, accessibility, and visitor amenities may significantly influence the quality of experiences and economic outcomes for local communities. By examining these factors through a comparative lens, this study aims to provide a nuanced understanding of the underlying dynamics driving tourism development in UP and Bihar.

The research methodology encompasses the utilization of surveys to gauge visitor satisfaction, interviews with tourism stakeholders to elucidate perspectives on tourism development, and on-site observations to assess infrastructure and management practices. These methods facilitate a comprehensive assessment of the tourism landscape in UP and Bihar, allowing for the identification of key drivers and impediments to sustainable tourism growth.

Findings from this study will contribute valuable insights to policymakers, tourism authorities, and local communities involved in the management and promotion of Buddhist pilgrimage sites. By recognizing and leveraging best practices while addressing challenges specific to each state, stakeholders can formulate targeted strategies to enhance the overall visitor experience, promote community engagement, and maximize the socio-economic benefits of tourism development. This research endeavours to foster a more sustainable and inclusive approach to tourism development in UP and Bihar, thereby enriching the cultural heritage and economic vitality of these historically significant regions.

KEYWORDS: *Tourism development, Buddhist pilgrimage sites, Uttar Pradesh, Bihar, comparative analysis, socio-economic impacts, sustainability*

INTRODUCTION

Buddhism holds profound cultural and historical significance in India, with numerous pilgrimage sites attracting millions of visitors annually. Uttar Pradesh (UP) and Bihar stand out as major centres of Buddhist heritage, boasting a rich tapestry of sacred sites, monasteries, and relics associated with the life and teachings of Gautama Buddha. Despite their shared historical legacy, these states exhibit distinct approaches to tourism development, resulting in varied tourism experiences and impacts at Buddhist pilgrimage sites. This study undertakes a comparative analysis of tourism development at selected Buddhist pilgrimage sites in UP and Bihar, aiming to unravel the factors shaping the tourism landscape in each state and identify opportunities for enhancing sustainability and visitor experiences.

Buddhist pilgrimage sites in Uttar Pradesh and Bihar hold significant cultural and spiritual importance, attracting pilgrims and tourists from across the globe. However, the development and management of these sites differ between the two states, influenced by factors such as historical context, governance structures, and local community involvement. Understanding these differences and their implications for tourism development is crucial for devising strategies to maximize the potential of these sacred sites while ensuring their long-term sustainability.

By conducting a comparative analysis, this study seeks to shed light on the unique challenges and opportunities facing tourism development in Uttar Pradesh and Bihar. By examining factors such as infrastructure, accessibility, visitor management, and community engagement, the research aims to identify best practices and areas for improvement in both states. The findings



of this study can inform policymakers, tourism authorities, and local communities about effective strategies for promoting sustainable tourism growth and enhancing the visitor experience at Buddhist pilgrimage sites in Uttar Pradesh and Bihar.

METHODOLOGY

The methodology you have outlined for your research on tourism development at Buddhist pilgrimage sites in Uttar Pradesh (UP) and Bihar is comprehensive and well-structured. Let us break down some key points:

- Mixed-Methods Approach:** Combining quantitative surveys, qualitative interviews, and site observations allows for a holistic understanding of tourism development in the selected pilgrimage sites. This approach enables you to gather both numerical data and nuanced insights from various stakeholders.
- Sample Selection:** The criteria for selecting pilgrimage sites, such as historical significance, visitor footfall, and tourism infrastructure, are logical and relevant. By choosing key landmarks in each state, you ensure that your research captures a representative sample of the tourism landscape in UP and Bihar.
- Quantitative Surveys:** Conducting surveys among tourists visiting the selected sites is an effective way to gather data on satisfaction levels, perceptions of tourism infrastructure, and socio-economic impacts. These surveys can provide quantitative data that can be analysed statistically to identify trends and patterns.
- Qualitative Interviews:** Semi-structured interviews with tourism stakeholders offer valuable insights into their perspectives on tourism development and its implications. By engaging with government officials, tour operators, and residents, you can explore diverse viewpoints and understand the complex dynamics of tourism in the region.
- Data Analysis:** After collecting the data, you will need to analyse it systematically. Quantitative data from surveys can be analysed using statistical methods, while qualitative data from interviews can be analysed thematically to identify recurring themes and narratives.
- Implications:** Your research has the potential to shed light on the impact of tourism development on local communities, heritage conservation, and economic growth in UP and Bihar. By exploring these implications, you can contribute to informed decision-making and sustainable tourism practices in the region.

Overall, your methodology appears robust and well-designed to address the research objectives effectively. Make sure to consider ethical considerations, such as informed consent and confidentiality, throughout the data collection process. Good luck with your research!

RESULTS

Based on the provided data from three respondents who visited Buddhist pilgrimage sites in Uttar Pradesh and Bihar, we can discern several factors influencing their visit experiences and perceptions:

Respondent 1

- Age: forty
- Gender: Female
- Nationality: Indian
- Visited Sites: Sarnath, Bodh Gaya
- Overall Experience: Very Good
- Factors Influencing Visit: Religious significance, Recommendations from friends/family.
- Accessibility: Very Good
- Signage and Information: Excellent
- Facilities: Very Good
- Maintenance and Cleanliness: Excellent
- Amenities Satisfaction: Excellent
- Economic Impact Perception: Positive (Yes)
- Engagement with Local Vendors: Yes
- Socio-Cultural Impact Perception: Positively impacting, fostering cultural exchange.

Respondent 2

- Age: fifty-five
- Gender: Male
- Nationality: Indian
- Visited Sites: Bodh Gaya, Rajgir
- Overall Experience: Good
- Factors Influencing Visit: Historical significance, Availability of amenities.
- Accessibility: Good
- Signage and Information: Good
- Facilities: Good
- Maintenance and Cleanliness: Good
- Amenities Satisfaction: Good
- Economic Impact Perception: Neutral (No noticed significant changes)
- Engagement with Local Vendors: Yes
- Socio-Cultural Impact Perception: Neutral, not noticed significant changes.

Respondent 3

- Age: thirty
- Gender: Female
- Nationality: Foreign
- Visited Sites: Bodh Gaya, Nalanda
- Overall Experience: Excellent
- Factors Influencing Visit: Cultural significance, Recommendations from friends/family.
- Accessibility: Excellent
- Signage and Information: Very Good
- Facilities: Excellent
- Maintenance and Cleanliness: Excellent
- Amenities Satisfaction: Excellent
- Economic Impact Perception: Positive (Yes)
- Engagement with Local Vendors: Yes
- Socio-Cultural Impact Perception: Positively impacting, preserving heritage.

These responses highlight the diverse range of factors influencing visitors' experiences and perceptions, as well as their overall satisfaction with the pilgrimage sites. The data also



suggests varying degrees of economic and socio-cultural impacts perceived by the visitors. Such insights can be instrumental in informing strategies for enhancing tourism experiences and promoting sustainable development at these pilgrimage sites.

Here's a bar chart visualizing the overall experience of the three respondents:



Figur no.1- Overall Experience

In this chart, the length of each bar represents the overall experience reported by each respondent. "Very Good", "Good", and "Excellent" are the categories, and the number of filled squares corresponds to the level of experience reported

Table No:01

Respondent ID	Age	Gender	Nationality	Visited Sites	Overall Experience	Factors Influencing Visit	Accessibility	Signage and Information	Facilities	Maintenance and Cleanliness	Amenities Satisfaction	Economic Impact Perception	Engagement with Local Vendors	Socio-Cultural Impact Perception
1	40	Female	Indian	Sarnath, Bodh Gaya	Very Good	Religious significance, Recommendations from friends/family	Very Good	Excellent	Very Good	Excellent	Yes	Yes	Yes	Positively impacting, fostering cultural exchange
2	55	Male	Indian	Bodh Gaya, Rajgir	Good	Historical significance, Availability of amenities	Good	Good	Good	Good	Yes	Yes	No	Neutral, not noticed significant changes
3	30	Female	Foreign	Bodh Gaya, Nalanda	Excellent	Cultural significance, Recommendations from friends/family	Excellent	Very Good	Excellent	Excellent	Yes	Yes	Yes	Positively impacting, preserving heritage



CONCLUSION

Your conclusion effectively encapsulates the significance of your empirical research paper on tourism development at Buddhist pilgrimage sites in Uttar Pradesh and Bihar. It succinctly highlights the key contributions and implications of your study:

1. **Deeper Understanding:** Your research provides valuable insights into the comparative dynamics of tourism management, visitor experiences, and socio-economic impacts at Buddhist pilgrimage sites in UP and Bihar. This deeper understanding enhances knowledge about tourism development in both states.
2. **Opportunities for Collaboration:** By identifying opportunities for collaboration, your study promotes the idea of stakeholders working together towards common goals. This collaborative approach can lead to more effective tourism management and development strategies.
3. **Capacity Building and Destination Enhancement:** Your research emphasizes the importance of capacity building and destination enhancement initiatives. These efforts can improve infrastructure, services, and overall experiences for tourists, contributing to the sustainable growth of tourism in the region.
4. **Synergy and Sustainable Development:** By fostering greater constructive interaction between stakeholders, your study aims to promote sustainable development of Buddhist pilgrimage tourism in UP and Bihar. This integrated approach considers both cultural heritage preservation and economic prosperity, ensuring long-term benefits for the region.
5. **Enriching Cultural Heritage and Economic Prosperity:** Your research seeks to enrich the cultural heritage and economic prosperity of Uttar Pradesh and Bihar. By promoting sustainable tourism development, you contribute to preserving the rich cultural legacy of these pilgrimage sites while also fostering economic growth and prosperity for local communities.

Overall, your conclusion effectively communicates the significance and potential impact of your research, outlining the importance of collaboration, sustainability, and holistic development in the context of Buddhist pilgrimage tourism in UP and Bihar.

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PANORAMIC REVIEW OF DISTAL RADIUS FRACTURES

**Bryam Esteban Coello García¹, Adriana Nicole Baño Cando²,
Maria Del Cisne Vega Cobos³, Jocelyne Estefania Arévalo Arcentales⁴,
Jonnathan Efrén Espinoza Calle⁵, Hjalmar Roberto Morán Romero⁶**

¹Postgraduate Doctor in Orthopedics and Traumatology at Faculdade de Ciências Médicas Minas Gerais. Belo Horizonte - Brasil. ORCID <https://orcid.org/0000-0003-2497-0274>

²General Practitioner at "Hospital Vicente Corral Moscoso", Faculty of Medical Sciences, Universidad de Cuenca. Azuay- Ecuador ORCID <https://orcid.org/0009-0001-2366-3566>

³General Practitioner at "Hospital Vicente Corral Moscoso", Faculty of Medical Sciences, Universidad Católica de Cuenca. Azuay- Ecuador ORCID <https://orcid.org/0000-0002-7517-7199>

⁴General Practitioner in Independent Practice, Faculty of Medical Sciences, Universidad Católica de Cuenca. Azuay- Ecuador ORCID <https://orcid.org/0009-0000-7789-9868>

⁵General Practitioner In Independent Practice, Faculty of Medical Sciences, Universidad de Cuenca. Azuay- Ecuador ORCID <https://orcid.org/0000-0002-2333-4324>

⁶General Practitioner at "Ministerio de Salud Pública", Faculty of Medical Sciences, Universidad de Guayaquil. Ecuador ORCID <https://orcid.org/0000-0002-8803-025X>

Corresponding Author: Bryam Esteban Coello García **Address:** Rua Tiradentes 266.Campo Belo. Minas Gerais. Brasil **Postal Code:** 37270-000

Article DOI: <https://doi.org/10.36713/epra16060>

DOI No: 10.36713/epra16060

ABSTRACT

Introduction: fractures affecting the distal radius are common, their incidence increases as life expectancy increases, leading to a larger population of individuals at risk of suffering these injuries. They are usually comminuted and intra-articular fractures that are outside the traditional eponymous classification.

Objective: to detail current information related to distal radius fractures epidemiology, anatomy, mechanism of injury, clinical evaluation, classification, imaging evaluation, treatment and complications.

Methodology: a total of 27 articles were analyzed in this review, including review and original articles, as well as clinical cases and books, of which 19 bibliographies were used because the other articles were not relevant to this study. The sources of information were PubMed, Google Scholar and Cochrane; the terms used to search for information in Spanish, Portuguese and English were: distal radius fractures, radius anatomy, Colles fracture, Smith fracture, Barton fracture, treatment of distal radius fractures.

Results: distal radius fractures account for about one sixth of all fractures treated in the emergency department, the incidence of distal radius fractures in the elderly correlates with the degree of osteopenia and increases with increasing age. The volar ligaments are stronger and provide greater stability to the radiocarpal joint compared to the dorsal ligaments. The most common mechanism is a fall on the hand in extension with the wrist in dorsiflexion. Currently, there is no consensus on the most optimal classification system for distal radius fractures.

Conclusions: knowing correctly the whole picture of distal radius fractures allows to have a better performance when treating them. It is essential not to overlook in the physical examination the exploration of the ipsilateral elbow and shoulder to rule out the presence of associated injuries and to perform a complete evaluation to detect other possible injuries or life-threatening problems. Distal radius fractures can be treated conservatively or surgically depending on several factors, so classification is essential. There are multiple alternatives in surgical treatment, so the most appropriate one should be chosen for each case. The most common complications in this type of fracture are median nerve dysfunction, post-traumatic osteoarthritis, malunion or pseudoarthrosis and stiffness of the fingers, wrist and elbow.

KEY WORDS: fracture, distal radius, Colles, Smith, Barton, treatment.



INTRODUCTION

Fractures affecting the distal radius are common, their incidence increasing as life expectancy increases, leading to a larger population of individuals at risk for these injuries. Fractures of the distal radius are more prevalent in children, adolescents and the elderly. However, fracture patterns, management and complications are different according to age group. Distal radius fractures can be caused by any trauma to the forearm, as well as the result of some types of falls. Isolated distal radius fractures present some eponyms, each one with its characteristic peculiarities, among these are Smith, Colles, Torus/Buckle, Greenstick and Die-punch fractures. These fractures mostly occur as a result of fall injuries to the outstretched hand. In the elderly they usually occur due to low energy falls. They are usually comminuted and intra-articular fractures that are outside the traditional eponymous classification. In children and adolescents, it is usually due to high energy falls sustained on the playground or during sporting events. In addition, fractures of the distal radius may show up in more complicated injury patterns, such as Galeazzi fracture-luxation, both bone fractures, radial styloid fractures, and Barton and Chauffeur fractures. The mechanism of these fractures is usually more complex or atypical, in the article we present epidemiology, anatomy, mechanism of injury, clinical evaluation, classification, imaging evaluation, eponyms, treatment and complications of distal radius fractures(1-4).

METHODOLOGY

A total of 27 articles were analyzed in this review, including review and original articles, as well as cases, clinical trials and books, of which 19 bibliographies were used because the information collected was not important enough to be included in this study. The sources of information were Cochrane, PubMed and Google Scholar; the terms used to search for information in Spanish, Portuguese and English were: distal radius fractures, radius anatomy, Colles fracture, Smith fracture, Barton fracture, treatment of distal radius fractures. The choice of bibliography exposes elements related to distal radius fractures epidemiology, anatomy, mechanism of injury, clinical evaluation, classification, imaging evaluation, treatment and complications.

DEVELOPMENT

Epidemiology

Fractures of the distal end of the radius are among the most common fractures of the upper limb, accounting for about one-sixth of all fractures treated in the ED. The incidence in the elderly correlates with the degree of osteopenia and increases with increasing age, as do hip fractures(5,6).

There is an incidence of about 67 fractures of the upper extremities per 10,000 persons per year, with distal radius and ulna fractures accounting for about 25% of these fractures, a relatively high number compared to fractures of the radial head,

which have an incidence of 2.5 per 10,000 per year, representing 1.7 to 5.4% of all fractures(7,8).

In men over 35 years of age, the incidence is about 90 cases per 100,000 persons per year, and remains relatively constant until the age of 70 years, when an increase is evident. Risk factors for fractures of the distal end of the radius in the elderly are reduced bone mineral density, white race, family history, female sex and early menopause(6,9).

Anatomy

The distal metaphysis of the radius consists primarily of cancellous bone. The articular surface has a biconcave facet to articulate with the proximal row of the carpus and a notch to articulate with the distal end of the ulna. About 80 percent of the axial load is borne by the distal radius and the remaining 20 percent by the ulna and triangular fibrocartilage. Reversal of the physiologic palmar tilt generates a transfer of loads directed to the ulna and triangular fibrocartilage. The remaining load is eccentrically borne by the distal radius and is concentrated on the dorsal aspect of the scaphoid fossa. The distal radius is the site of multiple ligamentous insertions; in the distal radius fracture, these commonly remain intact and support reduction through ligamentotaxis. The volar ligaments are stronger and provide greater stability to the radiocarpal joint compared to the dorsal ligaments.

Studies show that the average thickness at the level of the dorsal tubercle was 22.1 mm, the average slope of the lateral column was 155° while that of the intermediate column was 145°(6,10).

Mechanism of Injury

The most common mechanisms in young people are falls from a height, followed by traffic accidents and injuries generated in sports activities. In older people, distal radius fractures are usually the result of low-energy mechanisms, such as a simple fall from height. The most common mechanism is a fall on the hand in extension with the wrist in dorsiflexion. Fractures of the distal radius are seen when the wrist is in dorsal flexion between 40° and 90°, and the force required is less the smaller the angle of dorsiflexion. Initially there is a stress fracture of the volar aspect of the radius, subsequently, the fracture line is directed in a dorsal direction while the bending moment causes a compressive force resulting in dorsal comminution. Impaction of the metaphyseal cancellous bone further alters dorsal stability. Also, shear force affects the pattern of injury and generally causes alterations in the articular surface. High energy injuries usually result in fractures of the distal end of the radius with significant displacement or comminution(6,8,9,11).

Clinical Evaluation

The history should focus on the mechanism of injury, duration and quality of symptoms, and questioning of the affected individual should include details such as their dominant hand, profession and comorbid conditions, as these factors may influence treatment and possible surgical intervention.



Individuals usually show variable deformity of the wrist, with a displacement of the hand relative to the wrist dorsal in Colles fractures or dorsal Barton fractures and volar in Smith fractures. In addition, the wrist is swollen, with ecchymosis, pain on palpation and pain on mobility(8,9,12,13).

It is important to explore the ipsilateral elbow and shoulder to rule out the presence of associated injuries and to perform a

complete evaluation for other possible injuries or life-threatening problems. A complete neurovascular examination should be done, assessing the functionality of the median nerve. Symptoms of carpal tunnel compression are common, in about 13% to 23%) due to traction exerted at the time of wrist hyperextension, direct trauma from bone fragments, hematoma formation or increased compartment pressure(6,11,14).

Figure 1. X-rays showing right distal radius fracture, lateral and AP projections.



Source: The Authors.

Imaging Evaluation

Posteroanterior and lateral radiographs of the wrist should be performed, and oblique views may be used if the fracture needs to be better defined. Symptoms at the shoulder or elbow should also be assessed by radiography. Radiographs of the contralateral uninjured wrist allow assessment of the patient's ulnar variance, as well as scapholunate angle. Computed tomography (CT) allows assessment of the extent of intra-articular involvement. In addition, CT is often necessary when radiographs appear normal, but the history and physical examination strongly suggest a

fracture, and may also be useful in surgical planning. MRI provides little utility to radiography and CT in the diagnosis of distal radius fracture, however, it can be useful when there is ligamentary lesion involvement(6,8,11).

The normal radiological relationships are :

- Radial inclination: 23° on average with a range of 13° to 30°.
- Radial length: 11 mm on average with a range of 8 mm to 18 mm.



- Palmar (volar) inclination: 11° to 12° on average with a range of 0° to 28° .

Classification

Currently, there is no consensus on the most optimal classification system for distal radius fractures(3).

Descriptive classification:

- Open or closed.
- Displacement.
- Angulation.
- Comminution.
- Shortening of the radius.

Frykman's classification of fractures of the distal end of the radius is based on the pattern of intra-articular involvement. Odd fractures do not involve the distal ulna and even fractures involve the distal ulna.

- Types I/II of Frykman: extra-articular.
- Frykman's types III/IV: intra-articular involving the radiocarpal joint.
- Frykman's types V/VI: intra-articular affecting the distal radioulnar joint.
- Frykman Types VII/VIII: intra-articular affecting the radiocarpal and distal radioulnar joints(6,15-17).

Fernandez classification is a classification system based on the mechanism of production.

- Type I: metaphyseal fracture by flexion with loss of palmar tilt and relative shortening of the radius with respect to the ulna with injury to the distal radioulnar joint.
- Type II: shear fracture requiring reduction and often bracing of the articular segment.
- Type III: compression fracture of the articular surface without the characteristic fragmentation; may be associated with severe ligamentous injuries.
- Type IV: avulsion fracture or radiocarpal fracture-dislocation.
- Type V: combined injury with significant soft tissue involvement due to a high-energy injury.

There are other classifications such as the universal classification and the AO.

Eponyms

Colles' Fracture: traditionally referred to extra-articular fractures, it currently addresses both extra-articular and intra-articular fractures of the radius with various levels of dorsal angulation, dorsal displacement, radial translation and radial shortening. Physical examination reveals the characteristic fork back deformity, which is common in more than 90% of distal radius fractures. The mechanism of injury is a fall on the hand in hyperextension and radial deviation, with the forearm in pronation. Intra-articular fractures are more frequent in young individuals and as a consequence of high-energy trauma, presenting associated injuries, in addition to injury to the radiocarpal joint and the distal radioulnar joint.

Smith's Fracture or Inverted Colles' Fracture: presents a fracture with volar angulation of the distal radius with a gardener's spade deformity, with volar displacement of the hand and the distal fragment of the radius. The mechanism of injury is almost always a fall on the hand with the wrist in flexion and the forearm fixed in supination. It shows an unstable fracture pattern, usually requiring open reduction and internal fixation because of the difficulty in maintaining an adequate closed reduction.

Barton's Fracture: usually by a shear mechanism that gives a fracture-dislocation or subluxation of the wrist where the dorsal or volar margin of the distal radius accompanies the carpus and hand in its displacement. The volar injury is more common. The mechanism of injury is a fall on the wrist in dorsiflexion with the forearm fixed in pronation. The vast majority of these types of fractures are unstable and require open reduction with internal fixation with a neutralization plate to maintain a stable anatomical reduction.

Fracture of the Styloid Process of the radius: also called chauffeur's fracture or Hutchinson's fracture, it owes its name to the mechanism of abrupt recoil of the starting handle of old cars. It is a fracture-avulsion where the extrinsic ligaments remain attached to the styloid fragment. It can be caused by direct trauma, usually the mechanism of injury is a compression of the scaphoid on the styloid process with the wrist in dorsiflexion and ulnar deviation. Sometimes it involves the entire styloid, although it can also affect only its dorsal or volar portions. It is generally related to lesions of the intercarpal ligaments, usually requiring open reduction with internal fixation(6,8,9,17).

Treatment

The impact factors in the treatment are:

- Fracture pattern.
- Local factors: comminution, fragment displacement, bone quality, soft tissue injuries and energy of injury.
- Factors dependent on the affected individual: dominant hand, concomitant diseases, physiological age, lifestyle, occupation, associated injuries and level of collaboration.

The parameters in radiographs to define that a reduction is acceptable in a healthy and active individual are:

- Intra-articular step: 2 mm.
- Radial inclination: loss 5° .
- Radial shortening: less than 2 mm to 3 mm with respect to the contralateral wrist.
- Palmar tilt: neutral tilt 0° , however, up to 10° of dorsal angulation is acceptable.

Following a distal radius fracture, carpal alignment may have the greatest impact on the results:

Alignment of the carpus is determined by the intersection of two straight lines on lateral radiographs: one parallel to and through the midshaft of the radius diaphysis, the other through and parallel to the great. When the two lines intersect inside the carpus, the



carpus is said to be aligned. When the two lines cross outside the carpus, the carpus is said to be misaligned.

There are multiple factors related to loss of reduction secondary to closed manipulation of a distal radius fracture, the most notable of which are:

- The extent of metaphyseal comminution.
- The initial displacement of the fracture: the greater the level of displacement, the more energy transmitted to the fracture site and thus the greater the likelihood of unsuccessful closed treatment.
- The age of the patient: osteopenic elderly patients tend to show loss of reduction.
- Secondary displacement after closed reduction dictates and predicts instability, as well as repeated manipulation rarely presents radiological results considered satisfactory(6,8,17).

Conservative Treatment

All displaced fractures should be reduced in a closed manner, even when surgical treatment is considered necessary. The reduction of the fracture helps to reduce the subsequent inflammation, as well as reduces pain and relaxes the compression of the median nerve.

Cast immobilization is indicated in:

- Elderly individuals with low functional demands where the expected functional limitation is a lower priority compared to immediate health problems and/or surgical risk.

- Non-displaced or minimally displaced fractures.
- Displaced fractures with a stable fracture pattern, which can be expected to heal with acceptable radiological parameters.

Analgesia for closed reduction can be by intrafocal anesthetic block with supplemental intravenous sedation, intravenous regional anesthesia or conscious sedation.

Closed reduction technique (fracture with dorsal deviation):

The distal fragment is in hyperextension, traction is exerted to reduce the distal fragment over the proximal fragment generating pressure on the distal end of the radius, then a well molded brachio palmar splint is placed, with the wrist in neutral position or in slight flexion. It is advisable to avoid extreme positions of the wrist and hand, and the metacarpophalangeal joints should be left free. When the swelling has subsided, a well-molded cast is applied. The ideal position of the forearm, the duration of immobilization and the need or not for a long cast (brachio palmar) is still a matter of debate. Extreme flexion of the wrist increases the pressure inside the carpal tunnel, and stiffness of the fingers, which is why it is advised to be avoided. Fractures that require maximum wrist flexion to ensure reduction may require surgical management. The cast should be used for about 6 weeks or until healing is evident on X-rays. Serial radiological checks are recommended to detect probable loss of reduction.

Figure 2. Fluoroscopic control of distal radius fracture in AP.



Source: The Authors.

Surgical Treatment

Surgical treatment presents better functional results, being remarkable in pain and pressure at 3 months and in mobility at 6 months, showing integration to the work environment in less time.

Indications:

- Open fractures.
- Comminution, step or joint opening.
- Metaphyseal comminution or bone loss.
- High energy injuries.
- Secondary loss of reduction.
- Loss of volar support with displacement.
- Incongruence of the distal radioulnar joint.

Surgical Techniques

Percutaneous Nailing: generally used in extra-articular fractures or intra-articular fractures in two fragments. It is usually performed using two or three K-wires placed through the fracture

site, usually from the styloid process of the radius in the proximal direction and from the dorsal ulnar side of the distal fragment of the radius in the proximal direction. There are other methods used such as trans ulnar nailing with several needles. Percutaneous nailing is often used to supplement an antebrachio palmar or external fixator. The needles are removed 6 to 8 weeks after surgery and the cast can be maintained for an additional 2 to 3 weeks.

Kapandji "Intrafocal" Nailing: it is based on propping up the distal fragment to prevent its secondary displacement, placing needles radially and dorsally directly in the fracture site, then a lever is placed on the distal fragment and the needles are directed towards the opposite cortex, intact, of the proximal fragment, this action neutralizes the dorsal or proximal displacement of the fragments. It is a relatively simple, cheap and very effective method(6,18).

Figure 3. Fluoroscopic control of distal radius fracture in lateral view.



Source: The Authors.

External Fixation: it has a low rate of complications; however, since the appearance of locked volar plates, its use has been reduced.

Transarticular external fixation:

- Restores the length and inclination of the radius by ligamentotaxis, infrequently recovers palmar inclination.
- May require supplementary K-wires.
- Excessive distraction should be avoided so as not to cause finger stiffness, which can be seen in an increase in intercarpal distance.
- Fixator pins are maintained for 6 to 8 weeks.

Non-transarticular external fixation:

- Stabilizes the fracture of the distal radius with nails located only on the radius, proximal and distal to the fracture site.
- Requires the distal segment to be non-fragmented and large enough.
- Better than transarticular fixator for maintaining volar tilt, prevents carpal alignment defects and improves fist strength and hand function outcomes.

Open Reduction and Internal Fixation

Dorsal Plates:

- Most surgeons are accustomed to this approach, avoiding the neurovascular structures of the palmar aspect.



- The fixator is placed on the compression side of the fracture and neutralizes the forces that tend to collapse.
- Good results and theoretically earlier recovery and more anatomical restoration than those achieved with external fixation.
- The placement of dorsal plates is related to complications in the extensor tendons.

Non-Blocked Volar Plates

- Neutralization plate is usually indicated for Barton's volar shear fracture.
- It is usually not able to ensure fracture reduction when dorsal comminution is present.

Locked Volar Plates

- Stabilize distal radius fractures with dorsal comminution.
- They surpass the external fixator as the most widely used form of treatment in fixation of distal radius fractures.

Fixation with moldable plates with adjustable holes:

- Indicated in more complex fracture patterns involving multiple sites of the radial and ulnar columns.

Supplemental methods of Fixation:

- May be supplemented with an autograft, allograft, or synthetic graft. If necessary to stabilize smaller fragments, K-wires can be used.

Arthroscopy-Assisted Reduction of Intra-Articular Fractures:

Arthroscopy is very useful for the diagnosis of soft tissue injuries related to distal radius fractures, however there is discussion as to whether this technique provides better functional results than conventional techniques. Some of the fractures that would possibly benefit most from arthroscopically assisted surgery are:

- 1) articular fractures without metaphyseal comminution, particularly those with central impacted fragments.
- 2) Fractures showing notable injury to the interosseous ligament or triangular fibrocartilage, without a large fracture of the base of the ulnar styloid process.

Fractures of the ulnar styloid process: the indications for fixation of an ulnar styloid fracture are under discussion. Several investigators recommend fixation of displaced fractures of the base of the ulnar styloid process(6,8,9).

Figure 4. Postoperative control X-ray for Barton type distal radius fracture.



Source: The Authors.

Complications

Median nerve dysfunction: in a complete median nerve injury that does not improve after fracture reduction requires surgical exploration. Dysfunction of the median nerve after reduction requires removal of the splint and placing the wrist in neutral

position; if there is no improvement, exploration and consequent release of the carpal tunnel will be considered.



Post-traumatic arthrosis: it is the result of the injury of the radiocarpal and/or radioulnar joints, and shows that it is required to restore the anatomy of the articular surface.

Malpositioned consolidation or pseudoarthrosis: usually due to inadequate fracture reduction or stabilization. Usually requires internal fixation with or without osteotomy with bone graft.

Complications of external fixation include pin path infection, reflex sympathetic dystrophy, wrist and finger stiffness, and radial nerve sensory neuropathy. It is therefore advisable to place the pins under direct vision to identify the branches of the superficial radial nerve.

Stiffness of the fingers, wrist and elbow: it is generated primarily with prolonged immobilization with a cast or an external fixator. Therefore, the importance of correct occupational therapy to mobilize the fingers and elbow while maintaining wrist immobilization is evident, as well as adequate physiotherapy after the immobilization is removed.

In addition, tendon ruptures often occur, usually in the extensor pollicis longus tendon of the thumb. Degeneration of the tendon due to disruption of the tendon sheath vessels, as well as mechanical entrapment in the fracture callus, can result in rupture of the tendon fibers. Wearing dorsal plates has been associated with extensor tendon complications. Mediocarpal instability may result from injury to the radiocarpal ligaments or from a rupture of the dorsal or volar rim of the distal radius(6,8,19).

CONCLUSIONS

Knowing correctly the whole picture of distal radius fractures, allows one to have a better performance at the time of treating them. It is essential not to overlook in the physical examination the exploration of the ipsilateral elbow and shoulder to rule out the presence of associated injuries and to perform a complete evaluation to detect other possible injuries or life-threatening problems. Distal radius fractures can be treated conservatively or surgically depending on several factors, so classification is essential. There are multiple alternatives in surgical treatment, so the most appropriate one should be chosen for each case. The most common complications in this type of fracture are median nerve dysfunction, post-traumatic arthrosis, malposition consolidation or pseudoarthrosis and stiffness of the fingers, wrist and elbow.

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Conflict of Interest Statement

The authors report no conflicts of interest.

Funding

The authors report no funding by any organization or company.



ANALYZING SOCIAL PREJUDICE THROUGH LANGUAGE PARADIGM: THE SITUATION OF THE LGBTQIA+ MEMBERS

Kirck Michael Britos De Leon, Celso P. Resueño, Jr.

ABSTRACT

Discrimination against LGBTQIA+ is gaining attention these days and is growing more prevalent. One method used in this act is through language where people use words against them. However, social prejudice has not received enough attention, and few to no studies focus on using language paradigm to analyze this aspect in public school context. Therefore, this small scale-research aimed to assess the social prejudice of LGBTQIA+ members through language paradigm. The participants of this research were 10 LGBTQIA+ members from Cabiao and San Antonio who experience social prejudice and insults.

The thematic analysis revealed that language is used as a tool to derogate, stereotype, exclude LGBTQIA+ members socially and make them feel insulted and underestimated. Social prejudice also affects their focus and performance in doing school activities, makes them withdraw from school and lose their self-esteem. The study also found out that the participants tend to isolate themselves from society. Social prejudice instills self-doubt, fear, and depression in the participants. The coping mechanisms of the participants are never minding bullies, proving themselves that they excel, motivating themselves, and isolating themselves.

The researcher recommended that the LGUs should focus also about the LGBTQIA+ community, provide programs that protect them from social prejudice that is becoming rampant in the society.

KEYWORDS: discrimination, language paradigm, LGBTQIA+, social prejudice

1. INTRODUCTION

Discrimination against the LGBTQIA+ community is still a widespread and deeply ingrained social problem that takes many different forms all over the world. Simply because of their sexual orientation, gender identity, or gender expression, members of the LGBTQIA+ community frequently experience discrimination, stigmatization, and exclusion on both an individual and institutional levels. The pursuit of equal chances and a life free from prejudice and fear can be hampered by discrimination that takes the form of discrimination in job practices, healthcare access, education, and day-to-day social interactions. Even though progress has been made in identifying and resolving these issues, the struggle for full acceptance, understanding, and equality for the LGBTQIA+ community continues to be a critical human rights issue, demanding ongoing advocacy and awareness.

United Nations (UN), through the Universal Declaration of Human Rights (UDHR) ensures that "all human beings are born free and equal in dignity and rights." This means that there should be equality among all people, regardless of color, race and ethnic group, disabilities, sex, class, caste, creed, age, or sexual orientation. Furthermore, in the Philippine context, although there is no national law that has been passed to protect the LGBTQIA+ community against discrimination, several areas have enforced anti-discrimination ordinances that include sexual orientation and gender identity and expression among its protected categories (Manalastas, 2017).

Although two of 81 provinces, and 11 out of 1,637 cities and municipalities in the Philippines have started protecting the LGBTQIA+ community through their ordinances, it does not change the fact that 88.6% of Filipinos reside on areas without protection of against discrimination (Manalastas, 2017). This percentage includes the municipalities of San Antonio and Cabiao. The lack of programs that protect the LGBTQIA+ community in both municipalities against social prejudice prompted the researcher to deal with the analysis of social prejudice through language paradigm and its effect to the academic performance, social interaction, and mental health of the community members.

1.1 Social Prejudice Against the LGBTQIA+ Community

Research studies show that social prejudice against the LGBTQIA+ community still happens. For instance, one of the foci of Bionat's (2018) study was the analysis of forms of oppression and acts of discrimination experienced by parloristas. The data that was obtained demonstrated that the participants are aware of the discriminatory acts they experience, including social discrimination like being shut out of social situations or rejected from jobs, as well as verbal discrimination like being teased and catcalled. The participants narrate stories of being labeled "plagues of society," heckled for being gay, taunted by kids, referred to as thieves, harassed at school, and chastised for using the women's restroom in public places like shopping centers. Santos & De Jesus (2020) examined and characterized the various manifestations of bullying encountered by LGBTQIA+ college



students, encompassing verbal or written, physical, relational or social, and cyber forms. The study also delved into the adverse consequences of bullying. The analysis revealed that verbal/written bullying, manifested through persistent teasing, threats, intimidation, and name-calling, emerged as the most widespread form. Likewise, the study concluded that bullying had detrimental effects on these students, significantly impacting their emotional well-being and engendering feelings of unease, fear, and mistrust towards others.

Taragua (2020) delved into the challenges and matters concerning the academic well-being of LGBT students within a university setting. The research revealed the presence of identified issues and concerns related to academic bullying, primarily manifesting as verbal abuse, non-physical discrimination, and insensitivity towards others.

The primary goal of Amistad (2022) was to explore the real-life encounters of secondary school lesbian, gay, and bisexual youth, seeking to comprehend and assign significance to these experiences. The study uncovered that these LGB individuals are cognizant of societal prejudice against them. Moreover, they face bullying and discrimination from both peers and educators, leading to feelings of isolation due to their gender identity throughout their secondary education.

Aperocho et al. (2023) studied the occurrence of racism using hate speech in the comments against the LGBTQIA+ community on Facebook as a platform. It was found out that aside from religion, gender and sexual orientation are widely used patterns in hate speech. Also, the findings reveal that the discursive components may play a significant role in shaping how individuals interact with LGBTQIA+ people and express hate speech.

Capurihan et al. (2023) focused on assessing the level of language paradigm of social prejudice and finding out the level of social exclusion of LGBTQI members in a Higher Education Institution (HEI). The study revealed that students experience significant verbal bullying, homophobia, gendered language, and social bias. Furthermore, the social exclusion of LGBTQI students is exceptionally high in terms of normativity, social stigma, and religion. Finally, the language paradigm of social discrimination impacts how LGBTQI members are treated socially at UMTC.

Montaño et al. (2023) investigated the dynamics of relationships among Filipino same-sex couples facing challenges of homophobia, heteronormativity, and discrimination through a

biographical narrative approach. The research unveiled the existence of homophobic perspectives leading to stigma, discrimination, and oppressive conditions for marginalized same-sex couples. Nevertheless, the study demonstrated that these couples were resilient in maintaining their relationships despite the adversities they faced.

Pocan (2023) examined discrimination experienced by selected LGBTQIA intercollegiate athletes from private and public higher education institutions in the Philippines. It was stated in the study that there is a high number of cases in terms of sexist behavior and verbal abuse.

The abovementioned studies focused about LGBTQIA+ members outside school context, in a private secondary school, and in HEIs. Furthermore, the studies mentioned focused on various areas of discrimination in general. These circumstances prompted the researcher to deal with a qualitative study which examined and analyzed the social prejudice encountered by the LGBTQIA+ members using language paradigm.

1.2 Theoretical Framework

This study is anchored to the Queer Theory and Linguistic Philosophy as its theoretical and philosophical foundations.

Queer theory, situated within the realm of gender studies, is an interdisciplinary field that challenges the normative classifications of gendered and sexualized identities, which function as fundamental organizing principles in society, social interactions, and social institutions. As proposed by Anderson (2007, as cited in Das, 2020), this theory seeks to undermine the hegemonic order by questioning and deconstructing traditional concepts of sexuality, gender identity, and norms. It challenges binary frameworks that categorize individuals strictly as either heterosexual or homosexual and as either male or female.

In the context of this research, Queer theory explores how linguistic structures contribute to the reinforcement of social prejudice against the LGBTQIA+ community. It scrutinizes language paradigms to unveil implicit biases, stereotypes, and heteronormative assumptions embedded in discourse. By deconstructing linguistic norms and highlighting the power dynamics inherent in language use, queer theory aims to foster a more inclusive and nuanced understanding of sexuality and gender identity, seeking to dismantle oppressive language practices that contribute to social prejudice against the LGBTQIA+ community.

1.3 Statement of Purpose

This study entitled “Analyzing Social Prejudice through Language Paradigm: The Situation of the LGBTQIA+ Members” aimed to analyze and examine the social prejudice against the LGBTQIA+ members of the municipalities of San Antonio and Cabaio through language paradigm.

Specifically, this study sought answers to the following questions:

1. How may the language paradigm of social prejudice be described in terms of:
 - 1.1 Verbal Bullying; And
 - 1.2 Homophobia?
2. How may the language paradigm of social prejudice affect the LGBTQIA+ members in terms of:
 - 2.1 Academics;
 - 2.2 Social Interactions; And
 - 2.3 Mental Health?



3. How do the LGBTQIA+ members respond to the social prejudice?

1.4 Significance of the Study

Studying the situation of the LGBTQIA+ community is crucial for fostering a society that values inclusivity, diversity, equality, and gender celebration. By examining the challenges and discrimination faced by this community, people can identify and address systemic issues, advocate for policy changes, and promote social awareness. Understanding the unique experiences of LGBTQIA+ individuals is essential for creating environments that embrace difference and respect human rights. Through research and analysis, the whole community, not just the LGBTQIA+ community can work towards dismantling stereotypes, combating prejudice, and building a more compassionate world that recognizes and celebrates the richness of diverse sexual orientations, gender identities, and expressions within the LGBTQIA+ community.

In the context of this research, its battle cry is to promote understanding, inclusivity, positive change, and gender celebration in both the municipalities of San Antonio and Cabiao as there is little to no programs that reinforce the protection of LGBTQIA+ community.

2. METHODS AND PROCEDURES

2.1 Research Design

This study used a qualitative research design with a phenomenological approach. The meaning that an individual

gives to experiences that they personally go through is the main emphasis of qualitative research. By using this design, researchers hope to learn "what it is like" to be in a certain circumstance and how others, especially the participants, deal with it. The goal of qualitative research is to comprehend and explain the experiences that are discovered during the process of collecting data, rather than making any predictions about the information that participants provide (Willig, 2013)

2.2 Locale of the Study

This study was conducted in the municipality of San Antonio and Cabiao in Nueva Ecija. The researcher chose the said municipalities because of the little to no programs that reinforce the protection of LGBTQIA+ members.

2.3 Participants

The participants of the study were identified using a purposive sampling technique. According to Crossman (2020), purposive sampling is a type wherein the population's characteristics and the study's objective will be considered in selecting respondents. Further, this type of sampling will be applied to instances where proportionality in sampling is not the main concern. Though this kind of sampling technique is subjective, the researcher generated a qualifying criterion to provide justification of the selection of LGBTQIA+ participants: 1.) 18 years old and above; 2.) must be a resident of San Antonio or Cabiao; 3.) must be attending school; and 4.) must have encountered social discrimination and prejudice. Based on the researcher's criteria, ten participants could participate in the study.

Table 1
The Participants of the Study

Code	Municipality	Educational Background	Gender Identity
P1	Cabiao	College student	transgender
P2	Cabiao	Senior High School student	transgender
P3	Cabiao	College student	gay
P4	Cabiao	College student	transgender
P5	Cabiao	College student	bisexual
P6	Cabiao	College student	bisexual
P7	San Antonio	College student	bisexual
P8	San Antonio	College student	queer
P9	San Antonio	College student	gay
P10	San Antonio	College student	transgender

2.4 Data Gathering Instrument

A qualitative survey was used to gather necessary information from the participants. It is with the understanding that participants, although they have shared the same phenomenon, have different experiences in it. Specifically, this instrument was used to understand the experiences of LGBTQIA+ members. In any case that a participant cannot comprehend well the questions constructed in English, questions were translated in Filipino. Also, participants could answer in Tagalog. The qualitative survey underwent validation to ensure it matched the study's

objectives. It was validated by two (2) registered psychometricians and one (1) language major.

2.5 Research Procedures

This qualitative study utilized qualitative survey in analyzing the social prejudice encountered by the individuals who consider themselves as members of LGBTQIA+ community. The participants were gathered through a Facebook post and referral. They were informed that by proceeding with the data gathering, it is acknowledged that they consent to participate in this study



and have understood what is being requested as a participant. It has also been made aware that participation should be confidential and voluntary.

2.6 Data Analysis Technique

The research employed the thematic method of analysis outlined by Braun and Clarke (2006), known as the guidance framework, which includes stages such as familiarization, coding, generating themes, reviewing themes, defining and naming themes, and writing up. This approach encompasses diverse perspectives from multiple research participants, highlighting both similarities and differences and often yielding unexpected findings. Thematic analysis is applied to discern patterns within and across the data concerning the lived experiences of participants, specifically

those belonging to the LGBTQIA+ community. It aims to comprehend their emotions and thoughts, aligning with the study's objectives (Clarke, Braun, & Hayfield, 2015).

3. RESULTS AND DISCUSSION

Based on the data gathered, the language paradigm, effects of social prejudice, response to these social prejudice, and suggested topics are presented and discussed individually below.

3.1 Language Paradigm of Social Prejudice

The following tables show how language is used for verbal bullying and homophobia and brief descriptions for the themes generated.

Table 2
Language as a Tool for Verbal Bullying

Theme	Description	Sample Response
Derogation	This explores the insidious use of hurtful language to demean and marginalize individuals, illustrating the power dynamics.	<p>P1: <i>"Most people call me "bakla" ... they are using it as a derogatory term."</i></p> <p>P3: <i>"They call me "bakla bakla bakla" when I'm around."</i></p> <p>P4: <i>"... my subject teacher insults me by saying wala akong mararating sa buhay."</i></p>
Stereotyping	This explores the harmful deployment of prejudiced language to reinforce and perpetuate damaging stereotypes.	<p>P5: <i>"Natatawag na bakla kahit bisexual ako dahil puro babae yung mga kasama ko."</i></p> <p>P7: <i>"...people call me as a "tomby" in impolite ways without actually knowing the differences between lesbian and a bisexual."</i></p>
Social Exclusion	This explores how the deliberate use of hurtful language can alienate individuals, creating barriers to inclusion and fostering a divisive environment.	<p>P6: <i>"They said that my gender is not good for them to have in their side."</i></p> <p>P9: <i>"Being a member of a community which is labeled as 'society's outcast', I personally experienced bullied in accordance to how I display myself."</i></p>

The provided table elucidates how language serves as a tool for derogation, stereotyping, and social exclusion directed towards members of the LGBTQIA+ community, illustrating the negative impact of linguistic expressions on their societal inclusion. Its implication underscores the pervasive and harmful impact of

linguistic expressions in perpetuating discrimination and marginalization within society. This is supported by Capurihan et al. (2023) who claimed that LGBTQIA+ members in a university experience verbal bullying which impacts them based on their conduct



Table 3
Language as a Tool for Homophobia

Theme	Description	Sample Response
Insult	This explores the deliberate use of homophobic language targeting individuals based on their sexual orientation, perpetuating harm, and fostering an environment of prejudice and hostility.	P1: <i>"People would always use the words "bakla" and "bading" as their way to insult..."</i> P10: <i>"...they do name dropping like "raul" using deep voice mimicking the natural tone of my voice."</i>
Underestimation	This explores how homophobic language is employed to belittle and undermine individuals.	P2: <i>"...being called "salot", "bayot", "walang mararating sa buhay".</i> P4: <i>"...never kang tatanggapin sa langit dahil gawa ka ng demonyo."</i> P7: <i>"Sayang ka, ganda mo pa naman..."</i> P9: <i>"Bakla ka lang, wala kang mararating sa buhay."</i>

The table shows that language is used to insult and underestimate the LGTQIA+ members. Its implication lies in the reinforcement of discriminatory attitudes, fostering an environment of disrespect and undermining the value and capabilities of individuals within the community. The study of Baiocco (2018) also revealed that even in sports-related contexts, it is problematic and homophobic behaviors are present.

3.2 Effects of Social Prejudice and Insults

The following tables show how social prejudice and insults affect academics, social interactions, and mental health of the LGTQIA+ members and brief descriptions for the themes that were generated.

Table 4
Effects of Social Prejudice and Insults on Academics

Theme	Description	Sample Response
Focus and Performance	This explores how social prejudice and insults within an academe can detrimentally impact individuals' concentration, and overall academic achievement.	P2: <i>"...it affects my ability to focus and perform well in activities."</i>
Absence in school	This explores how social prejudice and insults can lead to the physical withdrawal of individuals from school.	P3: <i>"It feels like I do not want to go to school anymore."</i>
Self-esteem	This explores how social prejudice and insults can erode individuals' self-worth, fostering a sense of inadequacy and contributing to diminished confidence.	P5: <i>"Naaapektuhan nito yung self-esteem bilang isang kasapi ng LGTQIA+ community."</i>

Based on the statements of the participants, the social prejudice and insults affect their focus, performance, and self-esteem in performing tasks. Also, these also cause them to be absent from school, affecting their academic record. Taragua (2020) also

pointed out that issues such as verbal assault, non-touching physical discrimination, and insensitivity affect the academic well-being of the LGTQIA+ members.



Table 5
Effects of Social Prejudice and Insults on Social Interactions

Theme	Description	Sample Response
Self-isolation	This explores how social prejudice and insults can lead individuals to distance themselves from those who may perceive them as different, perpetuating a cycle of isolation.	P1: <i>"I would distance myself from unknown people to protect my peace."</i> P3: <i>"It feels like I don't wanna go out/leave the house anymore."</i>

The table shows that because the LGBTQIA+ members experience discrimination, they tend to isolate themselves from others. This also implies that discrimination leads to their self-imposed isolation as a coping mechanism in response to the social

stigma and marginalization they experience. The study of Capurihan et al. (2023) also found out that university students experience social isolation due to the social prejudice and insults they encounter.

Table 6
Effects of Social Prejudice and Insults on Mental Health

Theme	Description	Sample Response
Self-doubt	This explores how social prejudice and insults can instill uncertainty and insecurity in individuals, undermining their confidence and reinforcing a cycle of self-questioning and diminished self-belief.	P2: <i>"...that is why I asked myself 'What's wrong with me?'"</i>
Fear	This explores how social prejudice and insults can instill a sense of apprehension and anxiety in individuals, creating a climate of fear.	P3: <i>"It's always giving me fear..."</i>
Depression	This explores how social Prejudice and insults can negatively impact individuals' mental health, fostering a sense of hopelessness, isolation, and inadequacy.	P10: <i>"When I was starting to Transition from male to female, a lot of people make fun of me because of what I look like. I feel depressed and I even question my existence..."</i>

The table implies that the experience of social prejudice and insults has a profound and negative impact on the mental health of LGBTQIA+ individuals, potentially leading to the development of self-doubt, fear, and depression as psychological consequences of discriminatory attitudes and behaviors. This also implies that social prejudice and insults can cause negative mental health outcomes, which according to, Perez & Hernandez (2021) can be linked to disapproval of gender nonconformity, regardless

of whether violence based on sexual orientation is present.

3.3. Response to Social Prejudice and Insults

The table below shows the responses and coping mechanisms of LGBTQIA+ members when they encounter social prejudice and insults.

Table 7
Reponses and Coping Mechanisms

Theme	Description	Sample Response
Never minding bullies	This explores the empowering strategy of disregarding and resiliently brushing off social prejudice and insults.	P7: <i>"...I don't let them get on my nerves..."</i>
Proving oneself	This explores the resilient and determined effort of individuals to overcome social prejudice and insults by highlighting their capabilities, challenging stereotypes, and affirming their worth in the face of adversity.	P9: <i>"...it gave me the idea to strive more and harder to show them that I am bigger than what they thought I am."</i>



Motivation	This explores how individuals, faced with discriminatory attitudes, channel adversity into personal drive, using it as a catalyst for self-improvement, resilience, and determination.	P7: "I use those terms to motivate myself so I would have higher grades..."
Distancing oneself	This explores how individuals, confronted with social prejudice and insults, may choose a self-protective strategy of emotional and social detachment to preserve their well-being and shield themselves from the Harmful effects of prejudice	P4 "...at kapag di ka nakakabuti sa kin, lalayuan na kita for my peace of mind."

The presented table provides insights into the ways LGBTQIA+ individuals respond to social prejudice and insults, demonstrating a range of coping strategies. Among these responses, some individuals choose to "never mind" the bullies, indicating a deliberate effort to ignore or disengage from the negativity. Additionally, others opt for "proving oneself," suggesting a desire to highlight their capabilities and worth in the face of discrimination. Moreover, "motivating themselves" implies a self-encouragement approach, involving affirmations or internal sources of empowerment. Lastly, "distancing themselves" reflects a strategy of creating emotional or physical separation from those perpetuating prejudice, emphasizing the importance of self-preservation and well-being in the face of adversity. In the study of Doan Van (2018), the bisexuals coping mechanisms against discrimination were social support, resilience, and identity-specific media consumption.

4. CONCLUSIONS

This study analyzed social prejudice through language paradigm. Based on thematic analysis (Braun and Clarke, 2013), this research revealed that verbal bullying and homophobic language affect LGBTQIA+ members in terms of academic, social interaction, and mental health. The language is used as a tool to derogate, stereotype, socially exclude the LGBTQIA+ members and make them feel insulted and underestimated. Thus, this influences them to function well in the academe and in society and affects their mental health. Social prejudice affects their focus and performance in doing school activities, makes them withdraw from school and loses their self-esteem. The study also found out that the participants tend to isolate themselves from society. In terms of mental health, social prejudice instills self-doubt, fear, and depression in the participants. The coping mechanisms of the participants are never minding bullies, proving themselves that they excel, motivating themselves, and isolating themselves.

Finally, the researcher recommends the Local Government Units (LGUs) of San Antonio and Cabiao to give at least take a glance to the situation of the LGBTQIA+ community, provide programs and give emphasis to ordinances that protect them from social prejudice that is becoming rampant for they also play a vital role in community-building

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THE MEDIATING EFFECT OF MATH RESILIENCE ON THE RELATIONSHIP BETWEEN MATH SELF-EFFICACY AND STUDENT ENGAGEMENT IN MATHEMATICS

May Christine C. Digamo¹, Emmanuel P. Abuzo²

Department of Education, Laak National High School, Laak, Davao de Oro, Philippines¹

Graduate Education, St. Mary's College of Tagum, Inc., Tagum City, Davao del Norte, Philippines¹

Department of Education, Sawata National High School, San Isidro, Davao del Norte, Philippines²

Article DOI: <https://doi.org/10.36713/epra16057>

DOI No: 10.36713/epra16057

ABSTRACT

This study aims to determine whether math resilience significantly mediates the relationship between math self-efficacy and student engagement in mathematics among grade 8 junior high school students in Laak District, Division of Davao de Oro. This quantitative research utilized descriptive and correlational designs. There were 293 respondents identified through stratified random sampling. Moreover, this study employed three adapted research instruments validated and treated using mean, standard deviation, Pearson-r, regression analysis, and bootstrapping. The findings revealed high levels of math self-efficacy, student engagement, and math resilience among the grade 8 respondents. The results also showed a significant relationship between math self-efficacy and student engagement in math. Math resilience also positively correlates with student engagement in math. The results also revealed a significant relationship between math self-efficacy and math resilience. Moreover, the findings indicate that math resilience partially mediates the relationship between math self-efficacy and student engagement in math. These results encourage educators and administrators to develop and broaden programs and interventions to improve math self-efficacy, math resilience, and student engagement in math. Furthermore, it is essential to replicate the study in various contexts and locales to validate the findings of this research and provide a more profound knowledge of these variables on a broader scale.

KEYWORDS: Math resilience, math self-efficacy, student engagement in math, descriptive and correlational designs, regression analysis, bootstrapping, Davao de Oro, Philippines.

BACKGROUND OF THE STUDY

The lack of student engagement has been identified as a problem in many classrooms worldwide (Urias, 2022). In mathematics classes, engaging students has been an ongoing problem (Joshi et al., 2022). The engagement of students is an essential factor in understanding how students behave during the teaching-learning process (Delfino, 2019). Additionally, teachers have difficulties engaging students in mathematical learning (Abu-Hilal & Abed, 2019). Moreover, problems with students' disengagement in mathematics are increasing, which is an important issue since a lack of engagement may jeopardize students' mathematical proficiency and performance (Cevikbas & Kaiser, 2022). Furthermore, school officials reported that more students have grown less active, have a weakened sense of societal connection, and feel disengaged from their studies (Karlson, 2021).

Cevikbas and Kaiser (2022) stated that as learners progress from elementary to secondary school, many of them become disengaged in mathematics. Indeed, Collie et al. (2019) mentioned that the issue is particularly prevalent in Australia; nevertheless, it has also been discovered in other nations such as the United States, France, and Finland. Additionally, between 40 and 60 percent of high school students in America exhibit

chronic disengagement, as seen by their lack of effort, inattentiveness, and complaints of boredom (Holquist et al., 2020). Similarly, according to a recent Grattan Institute report in Australia, 40% of students are disengaged from learning, and an additional concern for schools is the growing number of disengaged students who are not enrolled, have low school attendance, and exhibit behavioral problems leading to suspension. Furthermore, in a study on mathematics learning engagement conducted in China, more than half of the 317 respondents claimed that they are not actively involved in preparation before class, discussions in the classroom, or even after class recovery (Lijie et al., 2020). In addition, the research revealed that a few learners have limited classroom involvement and are not particularly interested in mathematics learning. Furthermore, Joshi et al. (2022) stated that student engagement in mathematics has long been a problem in Nepal. Finally, the Programme for International Student Assessment (PISA) outcomes have informed East Asian countries and regions, especially Taiwan, that it is urgent to address issues concerning students' affective and cognitive engagement in mathematics learning (Lin et al., 2018).

According to a survey in the Philippines, student absenteeism is a problem in over 40% of schools (Trinidad, 2020), a warning sign of disengagement (Osher & Schanfield, 2019).



Additionally, according to Lacson (2020), the recommended academic ease of the Department of Education is grounded in the reality that students are getting disengaged from their educational learning. Llego (2021) also mentioned that the country has had reports of student disengagement from learning for a long time. Moreover, a study conducted in Cotabato implies a need to increase student engagement to improve teaching and learning performance (Tan & Gumban, 2019). Furthermore, low student engagement is evident in most schools, and it can be observed during math class discussions that there is an increasing population of passive learners (Zantua & Lapinid, 2018). Yabo (2020) further stated that students are usually sleepy, inattentive, and disengaged during mathematics discussions in the country.

Moreover, according to Deluao and Deluao (2018), the frequency of absences incurred by students in a year at a certain school in Davao is typically between 2 and 10, with an average of 50%. Additionally, according to Dodongan (2022), the belief that mathematics is a challenging subject complicates the scenario in the mathematics system of learning. He also stated that the students show no interest and are unwilling to learn about the subject, as evidenced by his study conducted in Davao de Oro, which revealed low levels of student participation. Further, only a few students engaged in mathematics learning, which was observed during discussions. Students were inattentive and refused to participate in class activities, as recorded in the Learning Action Cell (LAC) agenda and minutes.

Furthermore, the researcher has come across literature indicating that the problems mentioned above can be brought about by math self-efficacy and math resilience; hence, the researcher decided to consider these variables in the study. Moreover, math self-efficacy associated with math engagement has been studied by Sun et al. (2020) and Ozkal (2019); however, the former respondents were Chinese students while the latter were Turkish. Similar studies were also conducted on student engagement in mathematics, but in the flipped mathematics classroom context (Cevikbas & Kaiser, 2022; Lo & Hew, 2021). Additionally, Fitri et al. (2019) only focused on improving mathematical resilience in high school students. Further, the researcher has not encountered research similar to the current proposed study that was conducted in the locality, specifically on the mediating effect of math resilience on the relationship between math self-efficacy and student engagement in math, particularly among grade 8 junior high school students.

Student engagement is vital for learning since it is associated with several favorable results, such as lower dropout rates (Terrenghi et al., 2019; Abín et al., 2020). Disengaged students are less inclined to study and develop the skills required for success (Pagan, 2018). For that reason, in addition to the current research gap with other studies conducted in different settings, it is necessary to conduct the study in Laak District, Division of Davao de Oro. Moreover, the results of this research will benefit students, instructors, parents, school administrators, DepEd officials, and future researchers. The students will be the primary beneficiaries of the interventions, programs, and activities focusing on student engagement in math that the

teachers and DepEd officials will develop and implement. Also, this study will help math teachers focus more on creating fun, enjoyable, and meaningful classroom activities that engage students in the subject.

Most importantly, the results will be the basis for intervention in the problem of student engagement in the subject and serve as a guide for upcoming researchers. Furthermore, the results will be disseminated in LAC sessions of mathematics teachers and during local, regional, or national research forums. Finally, the researcher looks forward to publishing this study as a broader means of disseminating the findings.

STATEMENT OF THE PROBLEM

This research aimed to determine whether math resilience significantly mediates the relationship between math self-efficacy and student engagement in mathematics among grade 8 junior high school students in Laak District, Division of Davao de Oro.

Specifically, this sought answers to the following questions:

1. What is the level of math self-efficacy of students in terms of:
 - 1.1. mastery experience;
 - 1.2. vicarious experience;
 - 1.3. social persuasions; and
 - 1.4. physiological state?
2. What is the level of student engagement in mathematics in terms of:
 - 2.1. cognitive engagement;
 - 2.2. behavioral engagement; and
 - 2.3. affective engagement?
3. What is the level of math resilience of students in terms of:
 - 3.1. value;
 - 3.2. struggle; and
 - 3.3. growth?
4. Is there a significant relationship between math self-efficacy and student engagement in mathematics?
5. Is there a significant relationship between math resilience and student engagement in mathematics?
6. Is there a significant relationship between math self-efficacy and math resilience?
7. Does math resilience significantly mediate the relationship between math self-efficacy and student engagement in mathematics?

METHODOLOGY RESEARCH DESIGN

This quantitative, non-experimental research utilized descriptive and correlational designs since the researcher would seek to gather and interpret numerical data on the mediating effect of math resilience on the relationship between math self-efficacy and student engagement in mathematics without manipulating the variables. Specifically, a descriptive approach will be utilized since the study intends to describe the current level of math self-efficacy, student engagement in math, and math resilience in terms of their indicators. Moreover, this study will also utilize the correlational approach to assess the statistical relationship between math self-efficacy and student engagement in mathematics, math resilience and student



engagement in mathematics, and math self-efficacy and math resilience. Furthermore, the study will examine the role of math resilience as a mediator of math self-efficacy in influencing student engagement in math.

STATISTICAL TREATMENT OF DATA

The following statistical tools were used for the data to provide a more thorough interpretation.

Mean. It is the mathematical average of a set of two or more numbers. This statistical tool was utilized to calculate the extent of students' math self-efficacy, student engagement in math, and math resilience.

Standard Deviation. It gauges the dispersion of a dataset in reference to the mean. This tool was utilized for measuring the scores' degree of dispersion or proximity to the mean.

Pearson r. It gauges the direction and intensity of the connections between two variables. This data analysis tool was utilized to determine if a significant relationship exists between math self-efficacy and student engagement in math, math resilience and student engagement in math, self-efficacy in math, and math resilience.

Regression Analysis. It is a statistical technique utilized to evaluate the relationship between two or more variables and how they affect each other. This tool was used to identify if there are relationships between the independent variables and the dependent variable.

Bootstrapping. The bootstrap test is the most advanced technique for testing the indirect effect in mediation models since its distribution is typically asymmetric. This tool was utilized to determine the mediating effect of math resilience on the relationship between math self-efficacy and student engagement in math.

RESEARCH RESPONDENTS

The respondents of this study are the grade 8 junior high school students of four public schools in Laak District, Division of Davao de Oro, enrolled during the school year 2023-2024 under the face-to-face learning modality. Specifically, two schools are from the Laak North District, and two are from the Laak South District. These schools are purposefully chosen according to the Brigada Eskwela school category, which is based on the number of teachers in each school, to come up with a reliable number of samples. One school was chosen from the mega-large category, another from the large category, and the remaining two from the medium category.

The researcher utilized the Raosoft sample size calculator with a 95% confidence level and a 5% margin of error in determining respondents' sample size. Based on the computation, from a total population of 1229 grade 8 students, the sample size consisted of 293 respondents. Additionally, the researcher employed stratified random sampling to guarantee that respondents will be distributed evenly across all schools. The procedure provided 139 samples from School A, 77 samples from School B, 50 samples from School C, and 27 samples from School D, for a total sample of 293. Respondents in each

school were identified through simple random sampling. Moreover, the respondents were recruited through a printed letter given directly to individual participants in person with the help of the school gatekeepers. Furthermore, the researcher ensured that parental consents were obtained for the voluntary participation of the research respondents in this study.

RESULTS AND DISCUSSION

The following are the results of the study.

Table 1

Summary on the Level of Math Self-efficacy of Students

Indicators	Mean	SD	Description
Mastery Experience	3.59	0.72	High
Vicarious Experience	4.07	0.74	High
Social Persuasions	3.29	0.95	Moderate
Physiological State	3.07	0.95	Moderate
Over-all Mean	3.50	0.56	High

The overall mean for this variable is 3.50, which has a high descriptive equivalent and indicates that learners' self-efficacy in math is evident. The calculated standard deviation of 0.56 reveals that most of the responses are centered around the mean. This result implies that most respondents have given responses that are similar to each other. This also means that the respondents have similar levels of math self-efficacy. This indicates that the students strongly believe in their own potential to face and surpass math difficulties. They have confidence in their skills to solve specific math problems successfully. Additionally, it implies that these students with high self-efficacy in math tend to be the ones who succeed, accomplish tasks, and do well in math challenges.

This finding varies with most prior research findings, indicating that students' math self-efficacy was moderate. According to Awofala's (2023) research, learners' self-efficacy views in math result from a combination of high and low mastery and vicarious experience, social persuasion, and physiological state. Mendi and Eamoraphan (2020) also found a moderate degree of learners' math self-efficacy among their respondents. The findings also show that, on average, the students believed in and were confident in their self-efficacy in the subject (Batiibwe et al., 2020). Furthermore, unlike learners with poor mathematics self-efficacy, learners with high mathematics self-efficacy complete mathematical tasks more precisely and quickly (Arifin et al., 2021).

Table 2

Summary of the Level of Student Engagement in Mathematics

Indicators	Mean	SD	Description
Cognitive Engagement	4.16	0.59	High
Behavioural Engagement	4.28	0.71	Very High
Affective Engagement	3.76	0.50	High
Over-all Mean	4.07	0.53	High



In conclusion, this indicator's overall mean is 4.07, which is described as high and implies that student engagement in mathematics is observed. The low standard deviation of 0.53 demonstrates that most respondents provide consistent answers. This means that the respondents have similar levels of student engagement in math. This also means that the students demonstrated active engagement in mathematics by actively participating in class discussions and showing concentrated attention throughout instructional sessions. Additionally, attending math classes and solving challenging math problems brings them joy. Moreover, they skillfully create connections between mathematical ideas, facts, and their usefulness in actual situations.

The findings of Baranova et al. (2019) align with this finding that the students have high student engagement in math. When learners enjoy mathematics, recognize the value of classroom instruction and its application to their current and future lives, and find connections between the mathematical concepts they learn in the classroom, they are engaged with mathematics (Attard and Holmes, 2020). Ozkal (2019) also supports this finding that engaged students try to finish their tasks by internalizing them through greater effort and caution.

Table 3

Summary of the Level of Math Resilience of Students

Indicators	Mean	SD	Description
Value	4.39	0.71	Very High
Struggle	4.31	0.74	Very High
Growth	3.32	0.76	Moderate
Over-all Mean	4.01	0.60	High

Additionally, a high description and an overall mean of 4.01 for math resilience reveal that students' math resilience is manifested. The data responses are clustered around the mean, as indicated by the standard deviation 0.60. This implies that students learn mathematics with a positive mindset that enables them to overcome any challenges in the subject. Their mindset reflects growth, and they grasp the concept of struggle. Additionally, they have confidence in their ability to tackle mathematical tasks and recognize the value of seeking help when necessary.

The summary reveals that students have a high level of math resilience, which is consistent with the study of Amelia et al. (2020). Even under unfavorable circumstances, students have shown strong mathematical resilience by ensuring the success of the mathematics learning process (Agustin et al., 2022). Furthermore, students with high mathematical resilience exhibit an optimistic approach to their mathematics learning, enabling them to overcome challenging problems confidently. Conversely, students with low mathematical resilience may feel anxious and disappointed when faced with mathematical problems, ultimately failing to solve the given problem (Rohmah et al., 2020).

Table 4

Significant Relationship Between Math Self-Efficacy and Student Engagement in Mathematics

Independent Variables	Student Engagement in Mathematics		
	r	p-value	Remarks
Math Self-Efficacy	.608	0.000	Significant

The relationship between math self-efficacy and student engagement in mathematics is presented in Table 4. It shows that there is a significant positive correlation between math self-efficacy and student engagement in mathematics ($p < 0.05$). This means that the null hypothesis is rejected. The r-value of .608 indicates a moderate positive correlation between math self-efficacy and student engagement in mathematics. This means that when the math self-efficacy among Grade 8 students is high, student engagement in mathematics is also high. Conversely, when math self-efficacy is low, student engagement in mathematics is also low.

The results are consistent with the research of Salvan and Frias (2021), which found a strong correlation between students' mathematical self-efficacy and their student engagement in mathematics. Additionally, the Ozkal (2019) study showed that students' strong self-efficacy increased student engagement in the mathematics classroom and reduced dissatisfaction. Furthermore, Zakariya et al. (2019) discovered that learners with greater self-efficacy engage more in tasks.

Table 5

Significant Relationship Between Math Resilience and Student Engagement in Mathematics

Independent Variables	Student Engagement in Mathematics		
	r	p-value	Remarks
Math Resilience	.716	0.000	Significant

Table 5 shows the relationship between math resilience and student engagement in mathematics. It shows a significant positive correlation between math resilience and student engagement in mathematics ($p < 0.05$). Hence, the null hypothesis is rejected. The r-value of .716 indicates a highly positive correlation between math resilience and student engagement in mathematics. This means that when math resilience among Grade 8 students is high, student engagement in mathematics is also high. Conversely, student engagement in math is also low when math resilience is low.

The results corroborate the discovery of Rokhmah et al. (2019), who found that learners with strong mathematical resilience engage more in mathematics. Additionally, Reshma (2022) found that mathematical resilience allows students to persevere in their mathematical learning in the face of difficulties and setbacks. Reshma (2022) also mentioned that mathematical resilience aims to encourage engagement and perseverance in mathematics.



Table 6
Significant Relationship Between Math Self-Efficacy and Math Resilience

Independent Variables	Math Resilience		Remarks
	r	p-value	
Math Self-Efficacy	.620	0.000	Significant

Table 6 displays the findings on the correlation between math self-efficacy and math resilience. The table shows a significant positive correlation between math self-efficacy and math resilience ($p < 0.05$). This implies that the null hypothesis is rejected. The r-value of .620 indicates a moderate positive correlation between math self-efficacy and math resilience. This means that when math self-efficacy among Grade 8 students is high, math resilience is also high. Conversely, when math self-efficacy is low, math resilience is also low.

The findings are similar to the results obtained by Bron (2022), who investigated the correlation between math self-efficacy and math resilience and discovered a significant positive relationship, showing that learners with greater levels of math self-efficacy also have high levels of math resilience. The findings are also consistent with the research conducted by Hay et al. (2022), who found that students' learning depends on their mathematical self-efficacy beliefs since they influence how resilient the students would be to a mathematical task or challenge.

Table 7
Regression Weights, Standardized Total Effects, and Indirect Effects

Variables	Estimate	S.E	C.R.	Total Effect	p-value	Indirect effect	p-value
Student engagement in math ← Self-efficacy in math	0.66	0.049	13.51	0.578	0.001		
Math resilience ← Self-efficacy in math	0.254	0.047	5.378	0.66	0.001	0.324	0.001
Student engagement in math ← Math resilience	0.491	0.044	11.072	0.491	0.002		

In summary, there is a significant total effect of the independent variable on the mediator variable; a significant total effect of the mediator variable on the dependent variable; and the direct effect and indirect effect of the independent variable on the dependent variable are both significant; thus, there exists a partial type of mediation in this study. This means that math resilience partially mediates the relationship between math self-efficacy and student engagement in math. This also means that math self-efficacy directly influences student engagement in math without math resilience, and math self-efficacy also indirectly influences student engagement in math through math resilience. More specifically, the findings indicate that students' math self-efficacy with regard to mastery and vicarious experience, social persuasion, and physiological states directly influences student engagement in math in terms of cognitive, behavioral, and affective engagement. Moreover, students' math self-efficacy also indirectly influences student engagement in math through students' math resilience in terms of value, struggle, and growth.

The results corroborate the findings of Zakariya (2022), indicating that student's engagement with math tasks is determined by their level of self-efficacy in math. They engage in activities that they sense they can do and avoid activities that they sense are beyond their scope of expertise. Emmett et al. (2013) also asserted that students with low self-efficacy get disengaged from learning math. Moreover, to encourage our

students' engagement with mathematics, Trueman (2002) states that we must help them develop math resilience. Further, resilient learners in mathematics engage to mitigate the danger of dropping out of the subject area, according to Khumalo et al. (2022). Furthermore, mathematical resilience enables students to develop into mathematical thinkers, which provokes their willingness to engage with mathematics (Soebagyo et al., 2021).

RECOMMENDATIONS

The following suggestions are made in light of the data and conclusions presented.

1. Conduct orientations for teachers, parents, and students about how positive feedback, appreciation for efforts and achievements, and support and encouragement can help increase students' math self-efficacy. Social persuasion is important for the students to believe in their ability to do mathematical tasks, which helps them develop the essential skills required to succeed in mathematics.
2. Conduct specialized training for teachers, specifically mathematics teachers, about teaching techniques, approaches, and methods that reinforce positive classroom environments to prevent or minimize stressful classroom situations. Utilization of math manipulatives such as puzzles, games, and other psychomotor activities can also be incorporated during mathematics classroom



instruction to encourage students' positive physical and emotional perceptions and responses to the subject.

3. Organize seminars for teachers on effective teaching strategies, including strategic intervention materials and other methods that make mathematical topics easier for students to understand, including problem-solving. If the students understand the topic discussed with them, even if they are not good at math, it will help them develop resilience in mathematics.
4. Future researchers may investigate the results of this study to develop methods, interventions, and programs aimed at improving student engagement in math as well as their math self-efficacy and math resilience. They could also use this study as a reference for undertaking a similar study in a new context or setting.

CONCLUSIONS

Based on the findings of this study, the following conclusions were drawn.

1. Math self-efficacy is high among Grade 8 students.
2. Student engagement in math is high among Grade 8 students.
3. Math resilience is high among Grade 8 students.
4. A significant and moderately positive relationship exists between math self-efficacy and student engagement in math among grade 8 students. Thus, the higher the student's math self-efficacy, the more they are engaged in math.
5. A significant and highly positive relationship exists between math resilience and student engagement in math. Thus, the higher the math resilience of the students, the higher their engagement in math.
6. A significant and moderately positive relationship exists between math self-efficacy and resilience. Thus, the student's math self-efficacy is high, and their math resilience is also high.
7. Math resilience partially mediates the relationship between math self-efficacy and student engagement in math.

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ISSUES OF RE-CREATION OF HISTORICAL-NATIONAL IDENTITY IN THE GERMAN TRANSLATION OF "BOBURNOMA"

Abdurakhmonova Dilrabo

Senior Teacher, Namangan State University

ANNOTATION

This article dedicates the German translation of Boburnoma, one of the brightest examples of Uzbek literature. Here, it is shown some aspects that could not be shown its previous translations and paid attention its particular sides. In the future it is intended to carry out a monographic analysis on a comparative-historical and specific basis with the help of this new German translation of the work. It has also made clearer some didactic and practical aspects of this novel.

KEY WORDS: *Historical, didactic, translation, literature, describe.*

The historical-memoir work of Boburnama, which still holds a worthy place in world literature, is noteworthy as an important source for studying the history of ancestors. It contains a lot of information about the history, material and spiritual culture of the peoples of Movoraunnahr, Khorasan, Iran and India during the time when Babur lived.

The concept of national-cultural identity refers to the national specific reality of semantic lexical units, the features of socio-historical and economic development of nations, certain features of national culture, traditions and rituals.

G. Salomov expresses the following points about national identity: National identity means the material living conditions, spiritual way of life, nature, forest, mountain, field, water, land, sky, as well as myths and legends, history and religion of the people's life described in the literary work. their ideas, concepts, terms about literature and art and other special things are understood clothes, customs, currency, etc. are also among the components of national identity. It should be said that when it comes to the national specification of each work, to give this characteristic in translation, it is necessary to count the names of the clothes, food and drinks reflected in that literary monument or to carry out a linguistic-structural analysis if they are taken separately. In this case, the main attention should be focused on determining the extent to which objects or items related to specific historical, geographical, mythological, onomastic, and other concepts and views are absorbed into the spirit of the artistic work, and how important they are in the work or in the individual style and skill of the writer.

Every reader who reads Baburnama gets an idea of the historical and national environment. "Boburnoma" has skilfully drawn the forms and personalities of many historical figures (temporary rulers, military officials, representatives of science and art, etc.), and revealed their personal characteristics through the description of their actions and activities. When covering

the faces and qualities of historical figures, the author tries to be fair to them, to express the most important aspects of their characters in as clear and concise terms as possible, based on their lifestyle and conditions. He describes his father Umarshaikh Mirza like this: "He was a short man, with a smooth beard, a sunken face, and a lazy person. He used to wear a tight tunic, and when he was tying a tie, he pulled his stomach in to tie it, and if he put it on himself after tying the tie, I would be a bisyar, and the ties would break. He was careless in his clothes and work, and he made a mess of his dishes. At that time, the tables were completely closed, they used to communicate without opening the door. "Ezlar mostly wore a Mongolian burq in the divan." [page 65] In this image, all the main features of Umarshaikh Mirza's appearance are covered, from the way he wears clothes to some of his qualities. The lines in this place reflect the simple life, simple and sincere actions of the ruler of a small region, devoid of any pomp and luxury.

H. Dalov translates as follows:

Omar Sheikh Mirza war nicht groß, aber wohlgenährt. He had a white face and a bushy beard. (7a) Er trug einen magic schmal geschnittenen Mantel, den er immer eng schnürte; dabei musste er immer den Bauch einziehen. Wenn er wieder ausatmete, passierte es oft, dass die Schnüre rissen. Er war nicht anspruchsvoll, was seine Kleidung und Ernährung anging. A selected Diener band seinen Turban. Zu gener Zeit wickelten alle den Turban vierfach; ohne Falten und die Enden ließ man herunterhängen. Oft trug er im Sommer outside the Ratsversammlung eine mongolische Mütze.[1]

Meaning: Umarshaikh Mirza was short and short. His face was white and his beard thick. He used to wear a tunic very tight, so much so that when he tied his belt, he always pulled his stomach in and tied it. When he let himself go after tying it, the ties often broke. He was rude in wearing clothes and eating. The turban was wrapped by a special turban weaver. In those days, turbans were all over the place. They would hang the end. In the



summer, he always wore a Mongolian burqa in places other than the court. [2]

So, the word "ton", meaning the national dress of the Uzbek people, was translated into German as "Mantel". As a result, the nationality was lost in the translation. In our opinion, it would be appropriate for H. Dalov to describe the word "ton" in German as follows, using a figurative translation transformation: Ton- einer der Usbekische Nationalkleidung wie ein Mantel ohne Knopf und Kragen und wattiert. Es wird nicht nur im Alltag, sondern auch in der Freizeit, Trauer, Hochzeitszeremonien getragen. The word "turban" was correctly chosen as the equivalent of the word "turban". [3]

For example, the national lexical unit "belt" was used in the work, and the translator translated this word as "Schnüre". It would be appropriate to transcribe it in the form of "Belbag" and give an explanation next to it. In the explanatory dictionary of the Uzbek language, the word belt is given the following definition: A belt is a piece of fabric in the shape of a square scarf with flowery or flowerless edges, kiik, kiikcha. [Page 91]

As we know, the traditional national clothes of the Uzbek people include hats, yaktaks, belts, turbans, turbans, capes, ton, caps, mahsi-kovushs. Each of these clothes has its own ritual meaning. This group of terms also includes words that have no alternative, and the equivalent of such words does not exist in another language. They are also called realias, special words. A relatively perfect and realistic description of realities is given by S. Vlahov and S. Those who gave florins. According to him: "Realities are words and phrases representing things, objects, events related to the life, lifestyle, traditions, culture, social development of a certain nation, and they have a national and period character." [page 48]

In his work, Babur spoke again about Sultan Husayn's appearance and style, saying, "He was a tall man with a deer, glasses, and a beard." Belidin's tune was thin. My grandfather lived to a great age, was blind, and wore a beautiful red-green cloth. He had a black eye and wore a cap. "He used to go to prayer on Eids with a small basket full of food, and he would go to prayer with his stomach aching." [p. 156]

H. Dalov translates it as follows: "Sultan Huseyn Mirza war ein Mann mit Schlitzaugen, stämmig, aber schmal gebaut. Auch als er schon ein reifes Alter erreicht hatte und sein Bart ergraut war, kleidete er sich noch in Gewänder aus hellroter oder grüner Seide und trug eine schwarze Lammfellmütze o einen Kolpak (Pelzmütze). Sometimes begab er sich an einem Festtag zum Gebet und trug einen kleinen, flchen, nachlässig gewickelten und dreifach gefalteten Turban, der mit einer Reiher-feder geschmückt war".[S-301]

Meaning: Sultan Husayn Mirza was a man with squinty eyes and thin below the waist. Although he had grown old and had a gray beard, he wore clothes made of red and green silk. He used to wear a cap or a hat made of black lambskin. Sometimes on

Eids, he would go to prayer by folding a small three-fold turban flat, pricking a crow's feather. [4]

The translator translated the phrase "He wore a black hat or a hat" as "eine schwarze Lammfellmütze oder einen Kolpak (Pelzmütze)" and added an explanation for the reader's understanding. The word "turban" was correctly chosen as the equivalent of the word "turban". [5]

"Boburnoma" also mentions the names of "gewand" (Gewand), buttoned gewand (ein Gewand mit Knöpfen), "silk cloaks" (Seidengewänder), "beaver cloak with buttons" (Ehrewänder) and many other silk sarpos, which is of course in the study of traditional clothing. is important information.

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THE PLACE OF IBN SINO'S THEOLOGY IN THE HISTORY OF PHILOSOPHY

Ramzjon Isakdjanov

PhD in Philosophy, Associate professor of the UNESCO Chair on Religious studies and Comparative Study of World Religions, International Islamic Academy of Uzbekistan,

ANNOTATION

The development of philosophical thought in the Muslim world is undoubtedly associated with the name of Ibn Sina. His contribution to the history of philosophy can be said to have adapted Greek metaphysics to Islamic theology. It is now that the commonalities between religion and philosophy in theological issues are gaining relevance for researchers. The correct interpretation of the scholar's theological works also requires great knowledge. The article examines the study of Ibn Sina's theological legacy in the West, the views of Ibn Rushd and Ghazali on the philosophy of scholars, as well as the use of methodology in the study of theology.

KEY WORDS: *Vajib al vujud, Spirit, Mind, free will, agnosticism, theory of two truths, substance, accident.*

The period of development of thinking in Central Asia and Western Europe was called "Renaissance". The Renaissance was first realized in Italy, and it was called a period of cultural and spiritual revival on the way to get rid of stagnation and backwardness. The main sign of this term was to give up strictness in thinking, achieve freedom of thought and glorify men. The development of thought in Western Europe gradually moved away from church scholasticism and increased attention to human nature, its material and spiritual appearance. In fact, the Pope's Church has always emphasized that the human race is sinful, low in nature, and life is worth nothing, and only punishes or executes creative people, those who strive for superstition. It was because of the Renaissance that in Western European society, man was seen among divine beings. Culture, art, architecture, music and works of art were created in which man, his life and destiny, his divinity and beauty, and the infinity of his thinking were at the centre. This period started the development of Europe.

However, it would not be correct to consider that the Renaissance belongs only to Europe. The reason is that long before the renaissance period in Western Europe, science, culture, and art were highly developed in the land of Mavorunnahr, and this development reached its peak in the 9th-12th centuries. Ibn Sina's philosophical legacy is important in this development. His work not only influenced the development of Central Asian socio-philosophical thought, but also had its place in the development of Western European thought.

Ibn Sina's philosophical treatises were translated into Latin in the 12th century. Increasing interest in Ibn Sina's philosophy is associated with the development of Latin scholasticism in the 13th century...His philosophy attracted attention with its neo-Platonist aspects. Ibn Sina's ideas influenced the philosophical, social and spiritual views of European peoples due to the services of Ibn Boja and Ibn Tufail [1:10].

In contemporary Western philosophy, Ibn Sina is regarded as the most prominent scholar in Islamic philosophy. Ibn Sina's views greatly influenced from medieval Western philosophy to Renaissance thinking. Even some Western medieval philosophers put Ibn Sina's name above Aristotle. In the Middle Ages, Ibn Sina was never considered a stranger to the West.

We believe that Ibn Sina is at the center of the source of culture and self-realization of Western peoples. The last 150 years of Western researchers' research on Ibn Sina's philosophy and medicine is a clear proof of this [2:249].

The manifestation of Ibn Sina's philosophical teachings was in the form of a conflicting and complex process of philosophical debates during the time when the scientist lived, and ultimately the philosopher's philosophical views, in particular, his natural philosophical ideas and, especially, his views and important ideas related to the field of determinism, emerged.

According to the views of the philosopher, existence is a whole and consists of a complex system. Based on this, Ibn Sina considers the laws of determinism, its parts such as reality, causality, necessity, and opportunity to be the basis for analyzing each part of the universe.

According to the teachings of the thinker, there is a substance of all things in the universe. If considered according to the laws of material determinism, all existing things consist of two parts - Wajib al-Wujud and Mumkin al-Wujud. Interrelationship of organisms consists, first of all, of cause and effect. In this system, everything in existence appears in the state of emanation, that is, in the form of light radiating from Wajib al-Wujud. In order, the Body, Spirit, Mind, and associated celestial spheres, which have the appearance of possibility, arise, pass into existence. All of them are substances. There are also accidents in the universe, such as the qualities of existence: size, smell, and color.



The peculiarity of philosophical problems is that they are characterized by their dual nature. On the one hand, in each historical period, they have a specific historical form in connection with the specific aspects of this period. For example, the religion and religious institutions that dominated Western European medieval culture defined philosophical problems subordinated to theological problems. In the 17th and 18th centuries, the rise of mechanics to the first place in European science led to a view of philosophical problems from a mechanical point of view and caused the corresponding formation of the philosophy of that time.

Moreover, we can talk about the debate in early Islamic philosophy (for example, between the Jabarites and the Qadaris about free will), which went back to the political process of supporting or opposing the authority of the caliphs [3:12].

It is known from the history of philosophy that one of the main problems that have always interested thinkers is what is the most basic, main philosophical problem. Some say it is understanding and knowledge of God, others - study of man, and others - knowledge of the beginning of existence. What are the main problems of the field of philosophy? It mainly studies the world, man and the relationship between the world and man. All philosophical problems are related to one of these three philosophical problems.

The problem of method and methodology is extremely important in philosophy and the work of every philosopher. The scientific heritage of scientists and philosophers who have left a name in the history of science can be largely evaluated depending on the methods they relied on.

Method (Greek. *Metodos* - method) in a broad sense means a way, any form of creative activity. Methods are divided into three groups depending on the scale of their application.

First, universal methods used in all sciences and at all stages of scientific knowledge. Such methods are called gross general (philosophical) methods. They have a very general and universal character and are considered philosophical methods. They also serve as methodologies for other disciplines. Metaphysics, dialectics, and synergetic methods can be included in the group of such methods.

The second group of methods are called general scientific methods used at one or another stage of scientific knowledge, that is, either at the empirical or theoretical stage, or at the border of the transition from the empirical stage to the theoretical stage. The methods used in the empirical stage include observation, experiment, description, and measurement methods. Methods used at the theoretical stage include formalization, axiomatization, hypothetical-deductive methods. Common scientific methods used at the transition from the empirical stage to the theoretical stage include analysis and synthesis, induction and deduction, extrapolation and interpolation, abstraction, generalization, analogy, classification, modeling, etc.

The third group of methods are special scientific methods used in some acquired science or field of science. Special scientific methods, for example, spectral analysis method in physics, comparative analysis in grammar, questionnaire survey in sociology, material analysis in criminology and other methods can be cited as examples [4:10].

Today, the study of the rich scientific heritage of Eastern philosophers has gained urgent importance, and a number of practical works are being carried out in this regard. Philosophical study of the views of the major representatives of Eastern philosophy, especially Islamic philosophy, and analysis of its specific aspects will help to deeply understand the development of scientific-philosophical, social-ethical thought of that period, its important features and priority directions, as well as the laws of development, together with various philosophical, leads to a correct understanding of the essence of religious and mystical currents. It helps to draw theoretical and practical conclusions in the study of the influence of these teachings on the development of philosophical thought in the following centuries and in the present time.

In this sense, Ibn Rushd (1126-1198), an undoubtedly famous Andalusian philosopher, is considered the greatest person in the history of Eastern philosophy, especially Andalusian philosophy [5:61]. He was one of the most prolific thinkers and wrote about fifty major works. A number of original Arabic texts of Ibn Rushd's works have not reached us. They are known only through ancient Hebrew and Latin translations.

Ibn Rushd wrote commentaries on the works of ancient Greek thinkers - Plato, Aristotle, Euclid, Ptolemy, Porphyry, and earlier Islamic thinkers. In particular, he wrote special works that explained Aristotle's works ("Metaphysics", "Ethics", "Rhetoric", "Sophistics") in detail, showed their shortcomings, and at the same time revealed their general content. Ibn Rushd's comments were important in shaping the worldview of the thinkers of the Middle and Middle East, educating them in the spirit of Aristotle's ideas [6:11]. Ibn Rushd's commentaries were of great importance in introducing Greece not only to the East, but also to medieval Europe. In this sense, the study of Ibn Rushd's work, especially the analysis of his teaching on his philosophical views, is of urgent importance.

Ibn Rushd restored Aristotle's teachings to their original purity. It is known that the Alexandrian commentators significantly distorted Aristotle's views and added Platonic elements to it. Ibn Rushd was convinced that Aristotle's doctrine, properly understood, does not contradict the highest knowledge that man can attain. According to him, the human mind found its highest expression in the figure of Aristotle, so it is better to call him a divine philosopher. According to his contemporaries, "Aristotle explained nature, and Averroes explained Aristotle" [7:70].

According to Ibn Rushd, philosophy and religion are closely related. "Philosophy is the sister of religion," says Ibn Rushd [8:17]. They are companions by nature. Both philosophy and religion think first of all about God, the supreme cause of all



existence and the universe. But they differ in their way of thinking.

Based on this, Ibn Rushd paid much attention to the question of knowledge in his philosophical views. He bases the theory of knowledge on one of the most important questions that has excited philosophy throughout its history - the question of the possibility of knowing the world. Human ability to know, the thinker says, is unlimited compared to nature. The goal of knowing nature is to achieve the unity of nature in its diversity and to know the deepest principles underlying the phenomena of the material world [9:16].

Ibn Rushd solved the problem of the ratio of being and thinking, nature and human consciousness in a very clear, material spirit. His theory of knowledge was mainly directed against Ghazali's agnosticism, which denied the mind's ability to accurately know reality. Ibn Rushd said that man has unlimited possibilities of knowledge. The mind is an active force, a lever for knowing the world. The function of the mind is to perceive the things that exist together with their causes, and this is what distinguishes it from all other acquired faculties, for the mind that denies the cause must also be denied [10:34].

In general, Ibn Rushd interprets knowledge in a rationalistic spirit. Researcher E. Jilson emphasizes that the roots of modern rationalism are not connected with the scientific discoveries of the Italian Renaissance, but with the name of the Arab philosopher Ibn Rushd, who was born in Spain [11:9]. The philosopher left a true rational philosophy to his followers, which later had a great influence on the development of medieval Western philosophy, especially on the formation and development of Christian philosophy.

Among Western European scholastics, Ibn Rushd's most widespread doctrine was the "theory of two truths." The theory of two truths expressed by Ibn Rushd allows for the existence of two religious and philosophical truths of equal value. It also justifies the relative independence of science, which scientists and thinkers tried to defend. According to him, the philosophical truth is contained in the works of Aristotle, and the religious truth is adapted to the understanding of ordinary people.

Earlier philosophers were associated with caliphs and ministers such as Kindi, Farabi, and Ibn Sina. In this way, they developed and spread their ideas. This situation can be seen in the life of Imam Ghazali. Because he was also connected with Nizamulmulk Fakhru Malik and lived in Seljuk family. As if philosophy always needs to be protected by the power of the state. For example, Aristotle, the first teacher, lived under the shelter of Philip the Great and his son Alexander. In modern works, Voltaire lived in the palace of Frederick the Great. Goethe from Germany lived in the castle of Burgomister Feimer [12:73].

Among Ghazali's works is the book "Al-Mazmun bihi ala ghairi ahli" which some French writers say is the confession of Imam Ghazali as well as the confession of Jean-Jacques

Rousseau. But there is a difference between these two books. Rousseau wrote about work that spanned all areas of his life. Imam Ghazali is limited only to mental and spiritual issues. It is a treatise written to a friend. He himself describes it as such. A brother wrote in response to a question asked by his brother. On the cover of the book he says: "...you asked me, O brother, to know the original idea and secrets of all sciences, I will tell you that I have searched for the truth among all professions and sects. Rather than blindly following, reaching the level of self-learning, the ways of education, the ways of philosophy, and the philosophy of my choice, and the words of the people I found, and the reason why I left many of my students in Baghdad and returned to Nishapur. It is known that he studied a lot to find the truth. After that, he denounced philosophy and turned to Sufism. This is what Imam Ghazali thought was the key to his intellectual life [12:76].

One of the strangest aspects of this philosopher is that even though he lived 6-7 centuries before the English scientist David Hume, he followed the path of emotional philosophy. It is known that David Hume played an important role in the development of the thoughts of German I. Kant. Kant himself admitted that David awakened him from ignorance. If we know that Imam al-Ghazali lived before them and knew emotional philosophy before them, then we can know the intellect of the imam, how much higher it is than the famous European philosophers [12:77].

After Ghazali had studied the sciences of philosophy, he took what he needed from the philosophy and found out that it was fake, he realized that the science of philosophy was not enough to achieve the real goal. He began to study the direction of education and its idea. However, he had come to the same conclusion as Kant before entering into this idea. Kant's idea was that the mind cannot fully grasp and explore all things independently. This belief of Imam Ghazali is the second stage in the development of the mind. The first stage was imitation. In the second stage, he studied the views of previous philosophers. He also began to study the educational program as a lesson. Scholars of his time even criticized Imam Ghazali for exaggerating this issue. This action of Imam Ghazali was considered beneficial for the direction of education [12:78].

This is how Imam Hanbal denied Kharis Muhosibi's refutation written to the Mu'tazilites. Then Haris replied to Imam Ahmad, "It is obligatory to reject heresy." Then Imam Hanbal answered him, "Yes, it is obligatory, you refuted them after narrating their claims, but don't you know that if someone reads their ideas and then accepts them and then does not read or understand your refutation, this will cause him to deviate to their side." Imam Hanbal's words are correct. But this will be in relation to doubts that have not yet spread among people. But it is necessary to refute the doubts that are widespread among people, revealing their essence. We also wrote our own book "Ash-Shubhatir Rafiz" as a refutation of the myths of Jahiliyyah [12:78].

In short, in the VIII-XII centuries, socio-philosophical thoughts in the Muslim world experienced a flourishing period of their development. Scientific, philosophical, socio-political, and religious teachings in the countries of the Middle East and Near



East also greatly influenced this process. It is worth noting that socio-philosophical thoughts in the countries of Central Asia, the Middle East and the Near East developed as an integrated process, and it led to the formation of the doctrine called "Arab-Muslim philosophy" in the history of philosophy.

At the end of the 18th - beginning of the 19th century, the interest of the West in the Eastern world became so strong that some researchers use this period in the sense of the "Eastern Renaissance", i.e., the period of the renaissance of Eastern classical literature and science in the West [13:22]. By the 13th century, the influence of Peripateticism in the spiritual life of Western European countries increased. Central Asian, Arabian, Spanish scholars, as well as Eastern peripatetics played a big role in the spread of Aristotle's teachings in Europe. Hegel writes about this in his "History of Philosophy" century: "The familiarity of the Arabs with Aristotle's philosophy is important, because in this way the West also got to know this philosopher for the first time" [14:340]. At first, Europeans studied Aristotle's teachings through the commentaries of Farabi, Ibn Sina, Al-Kindi, later Aristotle's works such as "Analytics", "Topics", "Politics" were translated into European languages. Aristotelianism, which was spreading widely, was opposed to the doctrines of the Church. Under these circumstances, the Church in Europe banned the study of Aristotle's works in 1209. Not limited to it, they tried to adapt them to religious beliefs and use them in the theoretical justification of religion. Thomas Aquinas was of great service in this work. In his commentaries, Aristotelian philosophy was "neutralized" and declared to be the philosophical foundation of Catholicism.

The culture and spirituality of the peoples of Central Asia were located on the caravan routes that connected the East and the West, so they enjoyed both Eastern and Western cultures. The important thing is that our people enjoyed the spirituality of the West and the East, not only mastered their positive aspects, but took a creative approach to them and raised them to new heights. The confirmation of this idea can be seen in the example of scientific knowledge, religious faith, and art, which are components of spirituality. This opinion is confirmed by the works of our scholars who have a strong place in the history of culture not only of our country, but also of the whole world.

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THERMODYNAMICS V/S HUMAN DYNAMICS: AN INTERESTING COMPARISON FROM TEXT TO CONTEXT

Sunil K T¹, Aiswarya M²

¹Technical Officer D, Lpsc, Indian Space Research Organization

²Senior Research Fellow, Department of Education, University of Calicut

ABSTRACT

Thermodynamics can be viewed as one of the major branches under physical science which deals with energy transformations. Transfer of energy from one zone to another, its temperature, pressure, intensity and other thermal variables coming under thermodynamics. Human dynamics stands for the science which has a look on activities of human such as transfer of ideas, emotions, and interactions through different nature of relationships in human life. It can be considered as the 'in depth' detailing of interpersonal relationships and behavioral pattern exhibited by human beings as a result of stimulus and response in different occasions. Present study is an attempt to appreciate the comparison between thermodynamics and human dynamics. Even though there exists no significantly evident similarities between thermodynamics and human dynamics, by comprehensive evaluation we can find out the close matching between two branches. The exchange and conversion of energy are the fundamental aspects connect these two domains. Thermodynamics deals with the principles governing energy changes in physical system, while human dynamics involves understanding and managing energy in human interactions, emotions and behavior. This paper aimed to analyze the implication of different laws of thermodynamics especially zeroth law of thermodynamics have significant similarity with human life. According to the reflections of the paper, laws of thermodynamics have a significant impact on human life.

KEYWORDS: Thermodynamics, Human dynamics, zeroth law, energy transfer

INTRODUCTION

Emotional reactions can be considered as the base of interpersonal dynamics. Positive sort of interactions accelerates human dynamics through positive bondages and will share happiness, smile and security from one person to another. When it comes to negative emotional reactions, it will spread from one person to other emitting wide and intense negative emotional reactions knowingly or unknowingly. This can be considered as the basic underlying philosophy behind human dynamics that human beings connected with each other through an invisible / imaginary web of emotional bonds. There exists a kind of 'bystander effect' which means the emotional response of a person is determined by the stimulus he/ she received from another person. Eventhough ' human dynamics ' is a psychological construct, it have so many similarities with different theories existed in various other disciplines. Thermodynamics is a branch under physical science which have different laws which have crystal clear similarities with basic principles of human dynamics. Present paper is an attempt to analyze the similar glances between thermodynamics and human dynamics. First law and zeroth law of thermodynamics were taken into consideration to analyze the social implications of both disciplines ie, Thermodynamics and Human dynamics.

NEED AND SIGNIFICANCE OF THE STUDY

It is a prejudiced notion of the community that two different disciplines cannot share any attribute in common and cannot be

contributing to each other. Field of physical science and branch of psychology are two such fields which are considered as two entirely different hemispheres which cannot be correlated. Because of this reason, there exists a research gap in this particular area which lighten the interesting similarities between laws under physical science and theories under psychology. It is the need of the hour to merge multi disciplinary fields together for getting exceptionally good and productive results for social upliftment. Thermodynamics deals with Transformation of thermal energy to work and the application side of the same (thermal engineering) seeks about how efficient manner it can be made use in daily life. Human dynamics is nothing but how efficient way a human can think, do as effective and efficient manner.

Present paper aimed to focus on the comparable similarities between laws of thermal dynamics and basics of human dynamics.

OBJECTIVES

Following are the objectives aimed to be furnished after the completion of this paper.

- What is the meaning of thermodynamics?
- What are the laws under thermodynamics ?
- What is the meaning of human dynamics?
- What are the interesting similarities between thermo dynamics and human dynamics ?



CONCEPTUAL MEANING OF THERMODYNAMICS

Thermo stands for heat and dynamic stands for the motion out of heat. Thermodynamics stands for the governing principles of different impact of heat like temperature, pressure, volume change, transfer of heat etc within a system and system to / from surroundings. Different laws of thermo dynamics are there focusing on different attributes of heat/ energy transfer. According to the philosophy of thermodynamics, when heat and its associated characters imposed on different systems on various intensity, the mode/ nature of impacts may differ from one system to another. Thermodynamics contribute a universal framework for analyzing and optimizing energy transfer and conversion of energy and hence productive output. Even though thermodynamics have proven significant impact on chemical reactors, field of engineering, development of engine and other parts, climatic science etc but impact focuses on human dynamics found to be very limited. **Laws of Thermodynamics**

Here is an interesting attempt to link first and zeroth law of thermodynamics with basic underlying facts of human dynamics.

First law of thermodynamics was proposed by Rudolf Clausius. As per the essence of the law, energy can neither be created nor be destroyed in an isolated system. It can only be transformed from one form to another or transferred between objects within the system. This law is otherwise known as law of conservation of energy.

Zeroth Law of Thermodynamics were introduced as a by product of thermodynamic laws. According to the law, if two systems are in thermal equilibrium, with a third subsystem, then they will be in thermal equilibrium with each other. In other words, even though if there is no thermal connection with first and third subsystem intensity of thermal energy will be same for both since energy is transferred through second subsystem.

CONCEPTUAL MEANING OF HUMAN DYNAMICS

Human dynamics stands for the concept of how human interact with the environment through their emotions. Dynamic system means active involvement or mobility/motion of a particular organism according to environmental interaction or emotional intensity. Intellectual, emotional, interpersonal, intrapersonal and interpersonal interactions of a person with the environment compel him to be mobile/ active or dynamic. Such a comprehensive idea is termed as human dynamics.

AN INTERESTING COMPARISON BETWEEN THERMODYNAMICS AND HUMAN DYNAMICS

This is an attempt just out of curiosity to find out the implications of first and zeroth law of Thermodynamics in human life or human dynamics. As already stated according to first law of thermodynamics, in an isolated system, there will not be any creation or destruction of energy in an isolated system. Rather it can be transformed from one form to another.

FOLLOWING ARE SOME OF THE IMPLICATIONS/ SIMILARITIES BETWEEN THERMODYNAMICS AND HUMAN DYNAMICS

As per the first of law of thermodynamics, humanistic energy within an isolated system will not be changed from one state to another. A person who is so isolated without any connection with the outer environment then their level of energy will be poor resulting frustration and ends up in introvert type of personality trait (Michail, 2014).

If a person is in an isolated state, then there will be no slot for him to share his ideas/feelings or listen to somebody else. This will create enormous amount of frustrations, inhibition and gradually a kind of withdrawal symptoms to society may shown. Just like first law of thermodynamics, there will not any significant improvement in level of energy of human beings when they are in an isolated condition. Humanistic energy/ activity may remain same. Introvertism may develop as a result if isolation (Vallacher, 2002). We can see several glimpses of similarities between thermodynamics and human dynamics in common if we have a close look on both. Likewise energy of an introvert person or a person who is like isolated system may not be transferred any feeling from one person to another. That means the rate of social interaction is very low. But sometimes energy or mood of the person may change from one mood to another within that human being (McDougall, 2015).

According to zeroth law of thermodynamics, states that consider three system ie A, B, and C, A is having direct thermal connectivity with B, B is thermally connected to C, but A is not able to have thermal interaction with C. because of the high temperature of A, heat transfer happens from A to B and the same thermal effect may transferred to C even though there is no direct connection between A and C. Just like a system - surrounding relationship, or in other words how the efficiency of a thermodynamic system being affected by the surrounding's features, Similar ways are happening in the thought process of human being through social interactive activities and the features of surroundings or the stimulus what get through interactions with others. In such a way, Thermodynamic system can be compared with a human being. In a thermodynamic system, there exists body of matter with real /imaginary boundary where thermodynamic processes are being carried out. Like wise, integration of mind and body with real or imaginary boundary in which thought processing and hence physical responses is know as human system. Anything outside system which is separated with a real or imaginary boundary is called surrounding. According to psychological system of a human, surrounding is nothing but the society which is interacting continuously with her/him. Thermodynamic system undergoing series of thermodynamic process (property changes) until it achieve a state know as thermodynamic equilibrium. This processes or thermodynamic property changes is being carried out through mass or energy interaction or both to or from the surroundings. Result of cyclic processing of thermodynamic system is being evaluated for the deciding the efficiency of the same system.



Definitely favourable surrounding is a major role in interaction during processing and hence the efficiency (Liao, Heijungs & Huppel, 2012). Consider that the hotness of tea in a cup being changed after heat energy interaction with surrounding due to temperature gradient. Temperature of the surrounding is the determining factor that the tea became further hot after process or further cool after process or keep on the same state if there is no temperature gradient.

If the surrounding temperature is higher than the tea before process lead to increment of temperature, or in other words decrement will occur when surrounding has lower temperature than tea before interaction. Similar way emotions of human being can travel to high or low depends upon the features of surroundings which they are interacting. Final condition of the thermodynamic process is nothing but thermodynamic equilibrium. Means that there is no temperature gradient, no mass concentration gradient, and no force or moment unbalance within the system and also with surroundings. Here we can have a look to law of equilibrium or zeroth law of thermodynamics. Body A and B are having possibility for direct interaction of thermal energy but no possibility between A and C.

Since B and C are having interaction of thermal energy. In this context if body A is in a state that high temperature, heat energy will start to flow to B, and hence elevation of temperature of B.

Since Body B can interact with C, heat energy what is received from A will transfer to C until the achievement of equilibrium among A, B, and C. Here we can go through the "displacement" which is one mode of defense mechanism in psychology. For example, a superior officer shouted to subordinate and

subordinate shouted to his wife. Even though there is no direct connection with superior and wife of the subordinate, the impact of shouting is shared by wife also.

CONCLUSION

It can be considered as an interesting comparison of psychological constructs and scientific propositions to elucidate new flavors of facts which are useful in real life. This is an attempt to explore how thermodynamic principles metaphorically apply to human systems. This paper can be considered as a conceptual analogy rather than a direct scientific correlation. Hope the paper will pave new shades of inquisitive attempt to discover link between thermodynamics and human dynamics in a more clear way in future.

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TRADE WINDS: AN IN-DEPTH EXPLORATION OF INDIA'S IMPORTS FROM CHINA AND IMPLICATIONS FOR BILATERAL RELATIONS

Ms. Zeba Khan

ABSTRACT

Over the last five years, India's import patterns from China have been the subject of growing interest, given the profound economic and geopolitical implications of this trade relationship. This research paper delves into this pivotal aspect of global commerce by scrutinizing the key sectors, commodities, and trends characterizing India's imports from China. By leveraging extensive trade data, official reports, and academic sources, this study sheds light on the multifaceted dynamics of the India-China trade partnership. The analysis reveals not only the quantitative aspects of this trade but also delves into the economic, political, and geographical factors that influence the evolving contours of this vital trade relationship. This research provides a nuanced understanding of the intricate web of commerce that binds these two Asian giants.

KEYWORDS: India-China trade, import patterns, Bilateral trade, Trade dynamics, Trade trends.

INTRODUCTION

The economic relationship between India and China has witnessed significant growth and transformation over the past few decades. Both countries have become major players in the global economy, and their trade ties have expanded substantially. In recent years, India's imports from China have gained significant attention due to their volume, diversity, and implications for various sectors of the Indian economy. Understanding the patterns and trends in India's imports from China is crucial for policymakers, businesses, and researchers seeking to comprehend the dynamics of this bilateral trade relationship.

REVIEW OF LITERATURE

Girish Kumar Gupta and Mohd. Asif Khan (2017), the research paper focused on the "Exports Competitiveness of the Indian Textile Industry during and after ATC." The study aimed to assess the productivity of the Indian textile industry by examining its export competitiveness. The researchers provided a detailed explanation of the methodology used to calculate export competitiveness and analyzed various factors such as intercontinental marketplace dividend, proportional benefit, and annual growth rate, along with standard deviation. To gather the necessary data for analysis, the researchers relied on information obtained from the International Trade Center. The findings of the study indicated a growing trend in textile production in India. Additionally, a comparative analysis was conducted, revealing a significant competition between India and China in terms of percentage contribution. However, it was observed that Brazil's position did not improve after the ATC (Agreement on Textiles and Clothing) period. The research paper covered a time span of 22 years, from 1995 to 2016. The ATC period, from 1995 to 2004, and the period after ATC, from 2004 to 2016, were considered for analysis and comparison.

BACKGROUND

India and China share a complex history characterized by both cooperation and competition. Bilateral trade between the two nations has grown exponentially, with China emerging as India's largest trading partner. The Indian market has been flooded with a wide range of Chinese goods, including electronics, machinery, chemicals, textiles, and more. This influx of Chinese imports has raised concerns about its impact on domestic industries, trade imbalances, and national security considerations.

RESEARCH OBJECTIVES

The primary objective of this research paper is to analyze the patterns of India's imports from China over a five-year period. By examining the sectors, commodities, and trends in India-China trade, this study aims to achieve the following specific objectives:

1. Examine the key commodities imported from China and their significance.
2. Understand the value and volume trends of India's imports from China.
3. Provide insights and recommendations for policymakers and businesses to enhance bilateral trade and address any challenges.

METHODOLOGY

This research paper adopts a mixed-methods approach to analyze the patterns of India's imports from China. The study relies on both quantitative and qualitative data sources to provide a comprehensive understanding of the subject matter. The primary data sources include trade statistics, import records, and official reports obtained from government agencies, such as the Ministry of Commerce and Industry. Secondary data sources encompass academic research, industry reports, and scholarly publications related to India-China trade relations.



The analysis involves sector-wise breakdowns, trend analysis, and comparative assessments with other trading partners. Case studies of selected industries further contribute to a nuanced understanding of the import patterns. Additionally, interviews with industry experts and policymakers may be conducted to gather qualitative insights and opinions.

By employing this methodology, the research aims to provide a comprehensive and insightful analysis of India's imports from China, shedding light on the underlying patterns and trends in this important bilateral trade relationship.

SCOPE OF STUDY

The scope of this research paper, encompasses a comprehensive analysis of India's imports from China over a five-year period. The study will focus on the following aspects:

- Commodities and Sectors:** The research will examine the key commodities imported from China, their significance in India's economy, and the sectors to which they belong. This includes both raw materials and finished goods.
- Value and Volume Trends:** The study will analyze the trends in both the value (monetary worth) and volume (quantity) of India's imports from China over the specified five-year period. This will help in understanding the growth or decline in trade.
- Insights and Recommendations:** The research aims to provide valuable insights and recommendations for policymakers and businesses to enhance bilateral trade relations between India and China. It will also address any challenges and suggest potential solutions.

LIMITATIONS OF STUDY

While this research endeavors to provide a comprehensive analysis of India's imports from China, there are certain limitations that should be acknowledged:

- Data Limitations:** The accuracy and availability of data on imports from China may be subject to constraints. This study will rely on existing data sources, and any inconsistencies or inaccuracies in the data could affect the findings.
- Time Frame:** The research covers a five-year period, which may not capture long-term trends and fluctuations. Short-term anomalies may not fully represent the overall trade relationship.
- External Factors:** The study will not extensively delve into external geopolitical or economic factors that may influence India-China trade. These factors can have a significant impact on trade dynamics but are beyond the scope of this research.
- Generalization:** The findings of this study will be based on a specific time frame and may not be generalizable to different time periods. Additionally, the findings may not be directly applicable to other countries' trade relations with China.

Dependent and Independent Variables: In the context of this research paper, the dependent and independent variables can be defined as follows:

Dependent Variable: The dependent variable is the aspect of the study that is being analysed or measured and is expected to change in response to certain factors. In this research, the dependent variables include:

- Value and volume of India's imports from China.
- The significance of specific commodities in India's imports.

Independent Variables: The independent variables are the factors or variables that are being studied to determine their influence on the dependent variables. In this research, the independent variables encompass various factors that can impact India's imports from China, such as:

- Economic policies and regulations in both India and China.
- Market demand for specific products in India.
- Global economic conditions.
- Exchange rates.
- Trade agreements and tariffs.
- Political relations between India and China.

By analyzing the relationship between these independent variables and the dependent variables, this study aims to provide a comprehensive understanding of the trends and patterns in India's imports from China over the specified period.

2. OVERVIEW OF INDIA-CHINA TRADE RELATIONS

2.1 Historical Context

The trade relationship between India and China has a long history that dates back centuries. In recent decades, it has undergone significant transformations, leading to a substantial increase in bilateral trade volumes.

Historically, trade between India and China has been influenced by cultural, geographic, and political factors. The ancient Silk Road facilitated trade between these two nations, fostering economic ties and cultural exchange. However, in the modern era, trade relations were strained due to political differences and border disputes.

2.2 Bilateral Trade Agreements

Bilateral trade agreements have played a crucial role in shaping the India-China trade relationship. These agreements aim to enhance trade facilitation, promote investment, and address market access issues.

One of the significant agreements between India and China is the Asia-Pacific Trade Agreement (APTA), formerly known as the Bangkok Agreement. It is a preferential trade agreement among six countries, including India and China, aimed at reducing tariffs and promoting trade liberalization.

Additionally, the India-China Bilateral Investment Treaty signed in 2006 aimed to provide protection and promote investment flows between the two countries. The treaty aimed to create a



favorable investment climate by ensuring fair and equitable treatment for investors from both nations.

2.3 Trade Policies and Regulations: India and China have implemented various trade policies and regulations to govern their economic relationship. These policies encompass tariffs, non-tariff barriers, customs procedures, and regulations on specific sectors.

3. INDIA'S IMPORTS FROM CHINA, TRENDS AND PATTERNS

3.1 Total Import Volume

Analyzing the total import volume provides an overview of the scale and magnitude of India's imports from China. The following table presents the trends in the total import volume over the past five years:

Table-1
Total Import

Year	Volume from China (in million USD)
2017	61,238
2018	68,986
2019	70,319
2020	58,704
2021	64,912

(United Nations COMTRADE database on international trade)

The total import volume from China indicates the overall value of imports from China to India. The data shows that the total import volume increased steadily from 2017 to 2019. However, there was a decline in 2020, likely due to the disruptions caused by the COVID-19 pandemic. The import volume recovered in 2021, reaching a value of 64,912 million USD.

3.2 Sector-wise Analysis

A sector-wise analysis provides insights into the key sectors driving India's imports from China. The following sub-sections present an overview of the major sectors and their respective import trends.

3.2.1 Electronics and Electrical Equipment

India has been a significant importer of electronics and electrical equipment from China. The table below illustrates the import trends in this sector:

Table-2
Electronics and Electrical Equipment

Year	Import Value of Electronics and Electrical Equipment (in million USD)
2017	22,817
2018	25,692
2019	27,651
2020	22,574
2021	24,889

(United Nations COMTRADE database on international trade)

The import value of electronics and electrical equipment from China has witnessed a consistent growth trend from 2017 to 2019. However, there was a decline in 2020, potentially due to the pandemic-induced disruptions. In 2021, the import value showed a recovery, reaching 24,889 million USD.

3.2.2 Pharmaceuticals and Chemicals

Pharmaceuticals and chemicals are another crucial sector in India-China trade. The table below presents the import trends in this sector:

Table-3
Pharmaceuticals and Chemicals

Year	Import Value of Pharmaceuticals and Chemicals (in million USD)
2017	9,643
2018	10,329
2019	10,874
2020	10,246
2021	11,062

(United Nations COMTRADE database on international trade)

The import value of pharmaceuticals and chemicals from China has demonstrated steady growth from 2017 to 2021. The sector experienced a minor decline in 2020 but rebounded in 2021, reaching an import value of 11,062 million USD.

3.2.3 Machinery and Mechanical Appliances

Machinery and mechanical appliances form a vital sector in India's imports from China. The table below showcases the import trends in this sector:

Table-4
Machinery and Mechanical Appliances

Year	Import Value of Machinery and Mechanical Appliances (in million USD)
2017	6,843
2018	7,737
2019	8,126
2020	6,541
2021	7,306

(United Nations COMTRADE database on international trade)

The import value of machinery and mechanical appliances exhibited consistent growth from 2017 to 2019. In 2020, there was a decline in imports, possibly influenced by the pandemic. However, the sector experienced a recovery in 2021, with an import value of 7,306 million USD.

3.2.4 Textiles and Garments

Textiles and garments are significant sectors in India's imports from China. The table below presents the import trends in this sector:



Table-5
Textiles and Garments

Year	Import Value of Textiles and Garments (in million USD)
2017	2,926
2018	3,288
2019	3,223
2020	2,807
2021	3,046

(United Nations COMTRADE database on international trade)

The import value of textiles and garments from China remained relatively stable from 2017 to 2019. However, there was a decline in imports in 2020, potentially due to the pandemic's impact on the textile industry. The sector showed a slight recovery in 2021, with an import value of 3,046 million USD.

4. FACTORS INFLUENCING INDIA'S IMPORTS FROM CHINA

4.1 Cost Competitiveness

One of the primary factors driving India's imports from China is the cost competitiveness of Chinese products. Chinese manufacturers often benefit from economies of scale, efficient production processes, and lower labor costs, allowing them to offer competitive prices in the global market. The cost advantage makes Chinese goods attractive to Indian importers and consumers, contributing to the significant volume of imports.

4.2 Product Quality and Technological Superiority

China has made significant strides in improving the quality of its products and developing advanced technologies. Chinese manufacturers have invested heavily in research and development, innovation, and technological advancements, enabling them to offer a wide range of high-quality goods. The availability of technologically superior products, especially in sectors like electronics and machinery, makes China a preferred sourcing destination for Indian importers seeking quality and advanced products.

4.3 Supply Chain Integration

China has developed a robust manufacturing and supply chain ecosystem over the years. The country's extensive network of suppliers, subcontractors, and logistics infrastructure allows for efficient production and timely delivery of goods. This supply chain integration enables Chinese manufacturers to meet the demand of global markets, including India, with shorter lead times and better inventory management. The reliability and efficiency of China's supply chain contribute to India's reliance on Chinese imports.

4.4 Geopolitical Considerations

Geopolitical factors also play a role in shaping India's imports from China. While political tensions and border disputes have strained the bilateral relationship, the economic interdependence between the two countries persists. Both India and China

recognize the importance of trade and have taken measures to maintain economic engagement. However, geopolitical considerations and shifts in bilateral relations can influence the volume and nature of imports from China. Changes in trade policies, tariffs, and non-tariff barriers resulting from geopolitical factors may impact the import patterns between the two countries.

5. CONCLUSION

5.1 Summary of Findings

This research paper has analyzed the patterns of India's imports from China over the past five years. The study examined the total import volume, sector-wise analysis, key commodities imported, and value and volume trends. The findings reveal several important insights:

1. **Total Import Volume:** India's imports from China experienced a slight decline in 2020 due to the COVID-19 pandemic but showed a recovery in 2021.
2. **Sector-wise Analysis:** The major sectors driving India's imports from China include electronics and electrical equipment, pharmaceuticals and chemicals, machinery and mechanical appliances, textiles and garments, and others. Each sector exhibited specific import trends, influenced by factors such as demand, cost competitiveness, and technological advancements.
3. **Key Commodities Imported:** India imports a wide range of commodities from China, including electronic components, pharmaceutical products, machinery parts, textiles, chemicals, and consumer goods.
4. **Value and Volume Trends:** The import values and volumes varied across sectors and commodities, reflecting market dynamics, cost competitiveness, and other factors specific to each industry.

5.2 Implications and Recommendations for Policy-makers

Based on the findings, several implications and recommendations emerge for policy-makers:

1. **Diversification of Imports:** Policy-makers should consider strategies to diversify India's import sources to reduce dependency on any single country, including China. Exploring alternative sourcing destinations can help mitigate risks and enhance supply chain resilience.
2. **Enhancing Domestic Manufacturing:** To reduce reliance on imports, policy-makers should focus on promoting domestic manufacturing capabilities, particularly in sectors where India heavily imports from China. Providing incentives, fostering innovation, and improving infrastructure can help boost the competitiveness of Indian industries.
3. **Strengthening Trade Relations:** Despite geopolitical considerations, maintaining constructive trade relations with China is essential for the economic well-being of both countries. Policy-makers should work towards resolving disputes and improving bilateral trade agreements to create a conducive environment for trade.



5.3 Future Research Directions

This research opens avenues for further exploration in the field of India-China trade relations. Some potential areas for future research include:

1. **Impact of Geopolitical Factors:** Investigating the influence of geopolitical factors on India's imports from China in greater detail, considering the evolving political landscape and its implications for trade dynamics.
2. **Sector-specific Analysis:** Conducting in-depth sector-specific analyses to understand the factors driving imports, challenges faced by domestic industries, and potential strategies for promoting indigenous manufacturing.
3. **Trade Policy Analysis:** Examining the impact of trade policies and regulatory frameworks on India-China trade, including tariffs, non-tariff barriers, and trade facilitation measures.
4. **Consumer Preferences and Market Dynamics:** Exploring consumer preferences and market dynamics in India to understand the demand-side factors shaping imports from China, including the role of brand perception, product quality, and pricing.

By further exploring these research directions, policymakers and stakeholders can gain a comprehensive understanding of the complexities and nuances of India's imports from China, facilitating informed decision-making and fostering a balanced and sustainable trade relationship.

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LITTLE MILLETS EXPORTS-AN ANALYSIS

¹Dr. M. Vanishree Mam, ²Dr. G. B. Karthikeyan, ³Mr. B. Mohammed Fardheen Khan

¹Assistant Professor, Department of Commerce (International Business), Government Arts College, Autonomous, CBE – 18

²Head, Department of Commerce (International Business), Government Arts College, Autonomous, CBE – 18

³B. Com (International Business), Government Arts College, Autonomous, CBE – 18

INTRODUCTION

Little Millet, scientifically known as *Panicum sumatrense*, hails from the Eastern Ghats of India and has become a dietary staple in tribal communities. Its adaptability has extended its influence to Sri Lanka, Nepal, and Myanmar. Cultivated in Madhya Pradesh, Chhattisgarh, and Andhra Pradesh, it plays a vital role in food security and livestock feed. Little Millet's nutritional value supports a balanced diet, contributing to food security and dietary diversity. Despite its widespread cultivation, there is untapped potential. Research and sustainable farming practices could unlock its benefits, enhancing food security and livelihoods. Little Millet embodies resilience, adaptability, and cultural heritage, highlighting the intricate connection between agriculture, culture, and sustainable food practices.

- Minimal water, fertiliser, and pesticide requirements.
- Health-promoting with a superior micronutrient profile.
- Low Glycogenic Index, associated with diabetes prevention.
- Good source of minerals: iron, zinc, and calcium.
- Gluten-free, suitable for celiac disease patients.
- Beneficial for managing and preventing hyperlipidemia.
- It helps with weight, BMI, and high blood pressure reduction.
- Mutual supplementation of protein when consumed with legumes.
- Enhances overall protein digestibility.
- Easily accessible millet-based ready-to-cook products.
- Used for both food and fodder, making it farming efficient.
- Contributes to reducing the carbon footprint.

BENEFITS OF SMALL MILLETS

- Highly adaptive to various ecological conditions.
- Thrive well in rain-fed and arid climates.

LITTLE MILLET CONSUMPTION IN INDIA

A table shows the consumption pattern of little millets in Kilogram with the perspective states in the year 2018.

States	All India		Rural		Urban	
	Kg/hsh/m	Rs/hsh/m	Kg/hsh/m	Rs/hsh/m	Kg/hsh/m	Rs/hsh/m
Andhra Pradesh	6.52	80.39	7.06	84.68	1.11	37.86
Assam	18.82	381.96	18.82	381.96	-	-
Bihar	18.69	354.04	18.69	354.04	-	-
Chhattisgarh	4.18	55.14	4.22	55.41	1.97	40.71
Gujarat	0.39	17.82	0.48	19.81	0.36	16.69
Himachal Pradesh	2.00	50.00	2.00	50.00	3.80	47.03
Karnataka	7.12	87.45	8.41	103.37	1.05	119.96
Madhya Pradesh	1.71	96.48	1.88	90.08	0.86	44.89
Maharashtra	1.06	44.31	1.13	44.11	-	-
Orissa	4.06	48.69	4.06	48.69	-	-
Punjab	3.00	60.00	-	-	3.00	60.00
Rajasthan	0.75	30.00	-	-	0.75	30.00
Tamil Nadu	1.77	33.77	2.60	44.12	0.99	24.05
Uttarakhand	4.15	41.02	4.15	41.02	-	-
Uttar Pradesh	4.78	50.01	4.78	50.01	-	-
West Bengal	2.00	160.00	-	-	2.00	160.00

source: NSSO, MOSPI, Gol



REVIEW OF LITERATURE

Cyerin Priya Samarpitha, Reddy Madhavi, Chandana K.C (2023), Physico, Chemical and Functional Properties of Different Millets and their Suitability for Preparation of Enhanced Nutritious Laddu: Millets gelatin temperature is higher. It has more wettability, and cohesiveness is found higher. Food processing includes packing, storage, transportation operations, and post-harvest processes. So, these should be considered and make everything good. It concludes that sprouted millets are better at cooking than unsprouted millets.

Z. M. Hassan, N. A. Sebola and M. Mabelebele (2021), The nutritional use of millet grain for food and feed: Millet's richness in nutrient-rich and serves as a staple in many Asia and African countries used for various food products like porridge Coursers and as an effective feed ingredient in poultry production. The overview and core objective of this review is to provide insight into the selection of millet for different purposes to maximise their potential for food and feed. Pearl and finger millets often energy in paltry diets boats nutrients. Comparable to cereals and aid livestock performance.

Sourav das, Rituraj khound, Meenakshi santra, Dipak K santra (2019), Beyond Bird Feed: Proso Millet For Human Health and Environment. Proso millet, once overlooked, is now gaining attention due to its nutritional benefits like a low glycemic index and gluten-free nature and its use in various food applications, from bakery goods to infant food append distilleries. Proso millet, often underestimated, offers health benefits and diverse starch properties sub-table for various food applications and agricultural systems. This Requires successful collaboration among experts from diverse disciplines, such as breeders, geneticists, food chemists, and food industry partners.

R.V. Jaybhaye, I.L. Pardeshi, P.C. Vengaiiah and P.P.Srivastav (2014): Processing and Technology for Millet

Based Food Products. Millet divers small grains like pearl millet and finger millet are crucial for food security due to their resilience in harsh climates. Rich in nutrients, they aid in managing health conditions. While popular in Asia and Africa, their global utilisation is increasing. This paper examines millet-based traditional and convenience food, exploring processes and characteristics of ready-to-eat products. Advances in post-harvest processing highlight the potential of millet and sorghum, especially finger millet, for diverse value-added products yet minor millet.

Bhat S., Nandini C., Srinathareddy S., Jayarame G. and Prabhaka (2019): Proso millet (*Panicum miliaceum* L) a climate resilient crop for food and nutritional security. The genus *Panicum* encompasses over 400 grass species, notable proso millet, believed to have origins in Egypt and Arabia. It was domesticated in China at 10000 BP, and its cultivation spread across Asia, Europe, and eventually; therefore, this work attempts to compile the merged information available on crop history, phylogeny germplasm resources, and present status to make the crop comprehensive and revamp its cultivation. Proso Millet, a versatile crop with high nutrition and low resource needs, holds promise for global food security.

K. Navya, Jessie Suneetha W, B. Anila Kumari and P. ReddyPriya (2023), SENSORY EVALUATION OF GERMINATED GROUNDNUTS TO LITTLE MILLETS POWDER LADDU: The appearance, colour, flavour, taste, texture, aroma, sweetness and overall acceptability may affect the laddu's sensory scores. Regarding acceptability, the highest score was 8.80, and the lowest was 6.53. Anuradha and Laxmi reported that germinated laddu is made with 50% ragi, 30% soybeans, 15% groundnuts, and 5% black gram. This study persuades food sectors to utilise powdered germinated groundnuts and minor millets to enhance the nutritional and sensory quality of the product.

LITTLE MILLET SYNOPSIS

Table 1: Little Millets Exports for 2012- 2013 to 2021-2022

YEAR	QUANTITY (Y)	X	XY	X ²	YES
2012-2013	436	-5	-2180	25	
2013-2014	430	-4	-1720	16	
2014-2015	386	-3	-1158	9	
2015-2016	391	-2	-782	4	
2016-2017	442	-1	-442	1	
2017-2018	439	0	0	0	
2018-2019	333	1	333	1	
2019-2020	371	2	742	4	
2020-2021	347	3	1041	9	
2021-2022	370	4	1480	16	
2022-2023	0	5	0	25	
TOTAL	1683127.87		-2686	110	
	153011.6245		-24.41818182		

Source: APEDA



Show the quantity and value percentage of small millet exported for 2012-2022. The quantity percentage for the years 2012-2013,2013-2014, 2014-2015,2015-2016,2016- 2017 was 0.025,0.025,0.022,0.023,0.026, and the quantity percentage for 2017-2018,2018-2019,2019- 2020,2020-2021,2021-2022 was 0.026,0.019,0.022,0.020, 0.021, respectively. The highest quantity percentage was achieved in 2016-2017, and the lowest was achieved in 2018-2019. The value percentage of minor

millet for the years 2012-2013,2013-2014, 2014-2015,2015-2016,2016- 2017, was 8.3,8.10,9.3,8.6,10.2 and 2017-2018,2018-2019,2019- 2020,2020-2021,2021-2022 was 11.5,10.2,11.5,10.4,11.5 respectively. The highest value percentage was achieved in 2021-2022 and the lowest in 2012-2013. There is a negative growth rate in the years 2012-2013,2013-2014,2014- 2015,2015-2016,2016-2017. The highest negative growth rate was -2180 in the year 2012-2013.

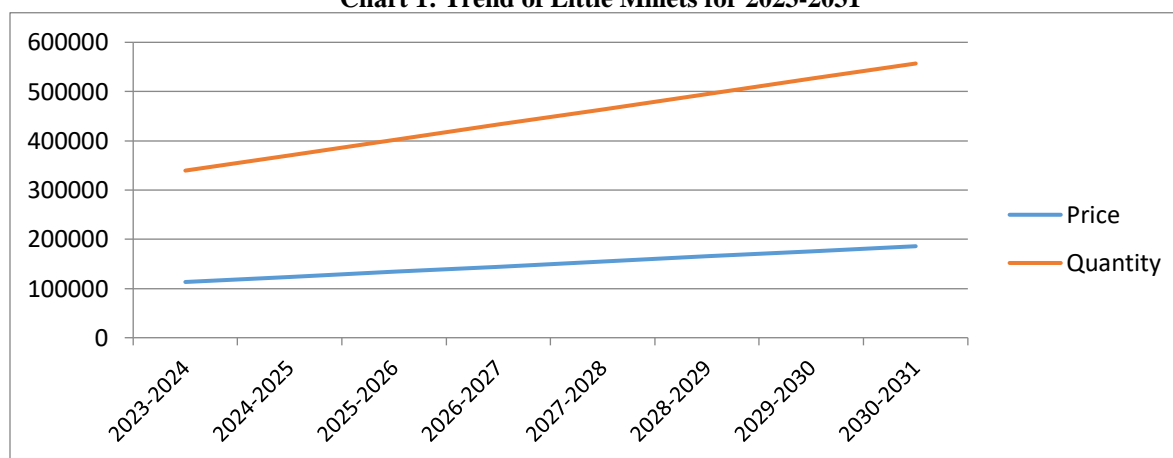
Table 2: Trend Projection of Little Millets Exports for 2023-2031

YEAR	Price	Quantity
2023-2024	113240.1	339478.6
2024-2025	123615.8	370556.4
2025-2026	133991.5	401634.2
2026-2027	144367.2	432712.1
2027-2028	154742.8	463789.9
2028-2029	165118.5	494867.7
2029-2030	175494.2	525945.5
2030-2031	185869.9	557023.4

Little Millets are projected to rise steadily over the next seven years, from 113240.1 in 2023-2024 to 185869.9 in 2029-2030. The quantity also increases progressively, indicating a growing

demand for this commodity. This upward trend suggests a positive outlook for the Little Millets market.

Chart 1: Trend of Little Millets for 2023-2031



The graph projects the positive result of both quantity and value of the Little Millets for 2023 to 2031, ensuring the market growth and export needs of Little Millets.

FINDINGS

Studies show millets possess elevated gelatin temperature, wettability, and cohesiveness in germinated groundnuts to little millets powder laddu. Proso millet emerges as a climate-resilient, nutrition-rich crop with potential for global food security. Millets, particularly finger millet, play a vital role in food security and offer diverse value-added products. These findings collectively underscore the versatility and nutritional significance of millets across various applications in the culinary and agricultural domains.

SUGGESTIONS

Consider incorporating sprouted millets for improved cooking outcomes. In laddu preparation, align ingredient proportions for optimal sensory appeal, aiming for a balance between appearances, flavour, and overall acceptability. Embrace Proso millet's resilience and nutritional benefits for enhanced global food security. Explore diverse value-added products leveraging millets, especially finger millet, to maximise their potential in contributing to both food and feed applications for sustainable agricultural systems.

CONCLUSION

In conclusion, the studies collectively emphasise the exceptional properties of millets, such as higher gelation temperature and



improved wettability. Crafting laddu recipes with specific ingredient proportions enhances both nutritional and sensory qualities. Proso millet emerges as a valuable resource for global food security, presenting a resilient and nutrient-rich option. Leveraging millets in diverse applications, from cooking to value-added products, underscores their potential contribution to global sustainable and nutritious food systems.

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ROLE OF AGRICULTURE AND ALLIED SECTORS IN INDIAN ECONOMY- SOME CHALLENGES

Shareya¹, DD Sharma² and Vandita Sharma³

^{1,3} PG Scholar (Agricultural Extension Education) and ²Professor (Agricultural Extension Education), MS Swaminathan School of Agriculture, Shoolini University of Biotechnology and Management Sciences, Solan (HP)-173229

Agriculture which fulfils the food and nutritional requirement of entire population is an essential component of Indian economy. The country becomes politically, socially and economically stable with the stability of agriculture sector. Being backbone of Indian economy, it contributes 19.9 percent to the Gross Domestic Product (GDP) of the country in the year 2020-21. Fishery, horticulture, animal husbandry, dairy farming, poultry and milk production etc. are the agriculture allied sectors which are integrated to aid proper planning and effective execution of the developmental policies. Apart from their significant contribution to the country's GDP, these sectors provide raw material to the industrial sector, employment opportunities, significant share in the national income, market for industrial products and earn foreign currency through export of goods. We all know that agriculture is the largest source of livelihood and about 70 percent of rural households still depend primarily on agriculture for their livelihood. India is the largest producer (25% of global production), consumer (27% of world consumption) and also importer (14% of pulses in the world). India having the world's second largest cattle population is the largest producer of milk (209.96 million tonne annual milk production in 2020-21). Agriculture plays a pivotal role in economic growth of our country through five types of inter-sectoral linkages viz; Providing food for domestic consumption, Releasing labour for industrial employment, Enlarging the market for domestic industrial output, Increasing the supply of domestic savings and Earning foreign exchange. According to the census 2011, approximately 54.6 percent of the population is engaged in agriculture and allied activities. The contribution of agri-allied sectors namely livestock (dairy, sheep, goat, poultry and piggery), fisheries (marine, in land and aquafarming), horticulture (fruits, vegetables, flowers, spices, aromatic and medicinal plants) and sericulture has been significant and continuously growing through years. The contribution of each sector is being discussed as under:-

❖ **Agriculture:** It is the most contributing and economic sector of Indian economy. Any change in agriculture sector has a large effect on the country's economy. The biggest industries like textiles, food processing, milk, jute and sugar all depend on agriculture to obtain their raw materials. The continuous technological innovation in the Indian agriculture sector plays a critical role in the growth and development of Indian agriculture system. Besides ensuring agriculture production, it facilitates in generating employment and reducing poverty to promote equitable and sustainable growth. The future of agriculture seems to

involve recent developed technology like robotics, temperature and moisture sensors, aerial images, Global Positioning (GPS) technology etc. due to which the farmers will be able to be more productive, efficient and environmentally sustainable. Several factors such as data analysis metrics and technological advancement in the existing agricultural machinery contribute to the production of foodgrains for consumption and commercial needs. The production of commercial foodgrains further support the economy and improves the GDP. Despite certain constraints like diminishing and degraded land and water resources, drought, flooding, global warming etc. which create hurdle in the sustainability and profitability of agriculture, the future growth of Indian agriculture backed by technological advancement and government initiatives seems to be promising.

❖ **Livestock sector:** It is an important sub-sector of agriculture which provides nutrient-rich food products, draught power, organic manure, domestic fuel, hides and skin and is a regular source of cash income for farming communities. The livestock sector in India contributes 16 percent of income to small farm households with an average of 14 percent for all rural households. The sector provides a living for 2/3rd of rural communities, employs about 8.8 percent of Indian population, contributes 4.3 percent of GDP and 29.3 percent of total agriculture GDP. Presently, the cooperative and private dairies have access to only 20 percent of the milk produced in the country but in future the private cooperate dairies may likely to overtake cooperatives in handling of milk volumes which is projected to reach 28.3million tonnes (National Action Plan for Dairy Development-Vision 2022). The total meat production in the year 2020-21 was observed 87.98 million tonnes with major contribution for poultry (47%) followed by buffalo (19.80%) and goat (14.25%) (Anonymous 2022). Besides, the sector is complementary and supplementary to agriculture in the form of critical inputs, contributing to the health and nutritional of households, supplement income, offering employment opportunities and financially being dependable "Banks on Hooves" in times of need.

❖ **Fishery and aquaculture sector:** The fish and fish products have emerged as the largest group in agricultural exports from India with 10.5 lakh tonnes in terms of quantity and 33, 442 crores in value. More than 50 different types of fish and shellfish products are exported



to about 75 countries around the world which accounts for about 10 percent of total exports of the country and nearly 20 percent of the agricultural exports. Thus, Indian fishery and aquaculture constitute an important sector of Indian agriculture which provide nutritional food to the millions of people. The fishing industry has been designated as Sunrise Sector with an outstanding double digit average annual growth rate of 10.87 percent since the year 2014-15. The sector produces a record 16.24 million tonnes of fish in fiscal year 2021-22 and has an enormous growth potential (Anonymous 2022). It has been identified as a powerful income and employment generator because it stimulates growth a number of subsidiary industries and provides a source of cheap nutritious food besides a source of income for a large portion of the country's economically disadvantaged population. India is the world's 3rd largest producer of fish and 2nd largest aquaculture nation after China. The blue revolution in the country demonstrated the importance of fisheries and aquaculture sector and is expected to play a significant role in the Indian economy in the near future.

- ❖ **Horticulture sector:** The horticulture sector comprises of a wide variety of crops from vegetables like potato, tomato etc., fruits like mango, banana, apple etc. to flowers, nuts, spices, medicinal plants and plantation crops. It provides various opportunities for generating income for horticultural farms/orchards. India has risen as world leader in the production of a variety of fruits such as mango, banana, guava, papaya, sapota, pomegranate, lime and aonla. The country is the second largest producer of fruits and vegetables in the world and retained its dominance in the production of spices, coconut and cashew nuts. Among the new crops successfully introduced for commercial cultivation in the country are Kiwi, Kinnow, Date palm, Gherkins and Oil palm. The horticultural crops certainly account for approximately 10 percent of the country's gross cropped area yielding about 107 million tonnes fruit production (Anonymous, 2022). Being more profitable than agriculture, the sector has emerged as a major driver of growth and provides employment opportunities in the primary, secondary and tertiary sectors. The launch of National Horticulture Mission has further increased horticultural production and productivity in the country. It has become a key driver of economic development in the many states of the country where the division of horticulture of the ICAR plays an important role.
- ❖ **Sericulture sector:** Sericulture is a technique of rearing silkworms on mulberry or non-mulberry plants for the production of silk fibres. It is mainly used for textile industries but a large amount of sericulture by-products (from silkworm cultivation to post-cocoon technology) can also add the value to the Seri-economy. According to Savithri *et al.* (2013), India ranks 2nd in the world in silk production and produces four varieties of silk viz; Mulberry (79.23%), Eri (13.32%), Tasar (6.8%) and Muga (0.54%). Because of its short gestation period and quick recycling of resources, sericulture has emerged as an important economic activity which is becoming popular in several parts of the country. Sericulture is done not only

for producing silk fabrics but also has tremendous use for the benefit of mankind. It represents a significant role in human health by providing functional food supplements and plays an important role in biopharmaceuticals, bioactive materials and drug delivery systems. Its bio-adhesive property can be explored in the area of tissue engineering and enzyme immobilization. In the year 2016-17, a total of 3795 metric tonnes of raw silk worth Rs. 1092.26 crore was imported mainly from China to supplement the domestic production for meeting the increasing demand, however, India holds its monopoly in Muga silk.

MAJOR CHALLENGES AND ISSUES

The Indian Agri-Allied Sector are presently facing many problems which have restricted full utilisation of their potential. Some of the main challenges and issues have been discussed as under:-

CHALLENGES RELATED TO LIVESTOCK

- ❖ **Increasing animal diseases:** There has been an increase in communicable diseases among animals. Most recently has been outbreak of Lumpy Skin Disease (LSD) in cattle across various states of India. For e.g. in the state of Rajasthan alone, more than one million cattle were diagnosed with LSD and down south, African Swine Fever was reported in Kerala.
- ❖ **Shortage of feed and fodder:** Due to rapid urbanization and shrinking land sizes because of breaking of joint family system i.e. partition of land generation after generation. The livestock sector is facing severe feed and fodder shortage. India has only 5 percent of its cultivable land under fodder production and area under permanent pasture and grazing land comprises merely 3.3 percent of total area, and that also has been steadily declining. According to a report of ICAR-Indian Grassland and Fodder Research Institute (IGFRI), there is a deficit of 23.40 and 11.24 percent in the availability of dry and green fodder respectively (Phand *et al.*, 2021).
- ❖ **Inadequate financial attention/concern:** The livestock sector does not receive the policy and financial attention it deserves. The sector receives only about 12 percent of the total public expenditure on agriculture and allied sectors which is disproportionately less than its contribution to agricultural GDP. Moreover, Indian livestock product markets are mostly uncertain, under-developed, lack transparency and generally dominated by informal market intermediaries. Lack of access to market acts as a deterrent to farmers to adopt improved technologies and quality inputs.
- ❖ **Issues related to cross breeding:** Though cross breed dairy cattle exhibit strength of the breed from which they descend, and it does multiply their capacity of production, but it also adds vulnerability to several diseases, nutritional deficiencies and environmental adaptation.
- ❖ **Impact of climate change:** Warm and humid conditions cause heat stress which affect behaviour and metabolic variations in livestock or even mortality. The changing monsoon season disrupts their mating season and in times of calamities like floods, the animal suffers the same



horrendous effects as people face like injury, starvation, thrust, displacement, illness, stress etc. Since they are voiceless, they have to stand behind in the rescue line.

- ❖ **Lack of adequate extension/guidance services:** While the role of extension services like vaccination, livestock awareness, deworming, prevention and control of diseases etc. in enhancing crop production and productivity is widely recognised, but the livestock extension never got the attention it deserved. This has been one of the reasons low productivity of India's livestock sector. Moreover, the shortages of veterinary doctors/surgeons who are the middle level livestock extension professionals and inadequate competencies among these extension professionals lead to further deterioration of livestock extension delivery (Sasidhar and Suvedi, 2016).

CHALLENGES RELATED TO FISHERY AND AQUACULTURE SECTOR

It has been observed that inland fishery has not been treated at par with agriculture in terms of taxes, electricity tariffs etc. and hence, fishery sector remained largely unorganized and traditional in most parts of the country with little technological improvement. Absence of inland fishery policy at the national level, non-coverage of fish farming under insurance, lack of reliable database pertaining to aquatic and fishery resources, non-availability of suitable fish yield models for multi-species fisheries for open inland waters and marine resources, weak multidisciplinary approach in fishery and aquaculture, inadequate attention to environmental, economic, social and gender issues in fisheries and aquaculture, inadequate human resource development and specialised manpower in different disciplines are some of the main challenges/problems related to the fishery and aquaculture sector.

CHALLENGES RELATED TO EXTENSION SERVICES

It has been observed from various studies that the extension services provided by the government agencies are inadequate. The most limiting factor with department of fishery was inadequate staff support coupled with inappropriate extension infrastructure, unequal distribution of fiscal and financial resources during the budget allocation and lack of technical content due to weak linkages between state department of fishery and research institutions. Hence, the focus of aquaculture extension needs to shift from the mere technology dissemination to the areas like value addition, quality control, market demand and consumer demand.

CHALLENGES RELATED TO HORTICULTURE SECTOR

Main challenges pertaining to horticulture development in India includes lack of quality inputs, market support, market intelligence, lack of mechanization due to small and fragmented land holding and lack of knowledge related to post-harvest handling. Similarly due to increasing cost of production, most growers do not get reasonable prices for their produce and sometimes they have to go for distress sale of their produce. Price fluctuation, inadequate infrastructure like transportation, cold storage, warehouses etc, wastage and spoilage loss and

paucity of post-harvest management, packing and storage, specialised transport and storage etc. are some of the other main challenges related to horticulture sector in the country.

CHALLENGES RELATED TO SERICULTURE SECTOR

Indian silk yarn is of poor quality which not only affects our competitiveness in the international market but also has resulted in preference of imported yarn in the domestic market. This problem arises due to lack of sufficient thrust on the adoption of improved technologies, strict disease control measures, quality leaves owing to insufficient inputs to mulberry garden, grading system for cocoons and quality-based pricing system. The area under silk food plants is declining which could be addressed by initiating area-specific research to improve soil fertility, increasing mulberry plants etc. It has been observed Bivoltine yarn is sturdier and is used by the power loom industry but only 5 percent of the silk produce in the India bivoltine because its production requires more attention and resources. Moreover, it yields just two crops in year compared to the yield of 4-6 crops by multivoltine silk, even the farmers don't have any incentives to switch over to bivoltine silk yarn production because the difference between the selling price of bivoltine and multivoltine is not much. Similarly, fragmented and ad hoc approach, inadequate adoption of technological package developed through research and development, no involvement of private sector in a big way in seed production, no penetration of the government schemes, improper forward and backward linkage and dumping of cheap Chinese raw silk and fabric in Indian market are other challenges related to sericulture in our country.

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A LINGUISTIC SURVEY OF BOTANICAL TERMS

Sultonova Kibriyo

*Assistant Teacher, Navoi Innovation University, Navoi, Uzbekistan
Basic Doctoral Student, Navoi State Pedagogical Institute, Navoi, Uzbekistan*

ABSTRACT

This article describes the synonymy of botanical terms, the problem of their systematization, and the creation of a dictionary of synonyms for botanical terms.

KEY WORDS: *term, terminosystem, scientific method, botanical terms, term, dialectal variant, synonym, literary language, dialect*

The research object and system of terminology is wide and varied. Today, in its center, concrete and social sciences, lexical units in their system are studied by researchers in the linguistic direction using diachronic and synchronic methods. Especially in modern linguistics, scientific researches are being carried out in the field of interpretation, nationalization of terms related to specific sciences, creation of special explanatory dictionaries, translation and introduction of lexical units of the dialect into the literary language. The use of scientific terms in everyday life, science and modern textbooks is increasing, and their purpose and meaning are becoming more relevant.

Among these sciences, botanical terminology and the study of terms and terms in its terminosystem is one of the topical topics of today's linguistics. The need for explanatory dictionaries of the terms of this field and its system is increasing. Demands and needs for the creation of these dictionaries are being put on the agenda. When conducting these studies, it is appropriate to consider the following:

First, to create a methodology for identifying words and combinations specific to botanical terms;

Secondly, to systematize botanical terms through the created methodology;

Thirdly, the division of the terms contained in the botanic terminology system into internal systems, that is, a spiritual group, a thematic group, and spiritual nests;

Fourth, consider the issue of lexicographic interpretation and description of terms in this system;

Fifth, to contribute to our national vocabulary by identifying botanical terms and their synonyms in dialects, and introducing them into an explanatory dictionary;

Sixthly, it is important to study the dictionary of field terms and the features of translation of words and units related to the field based on lexicographic interpretations, as well as scientific research.

1. In the implementation of these tasks, it is desirable to implement the issue of lexicographic interpretation based on explanatory, special and dialect dictionaries.
2. It is known that dictionaries of all disciplines are mainly a product of scientific speech. Based on this, we think that it is appropriate to classify and define

botanical terms by dividing them into three groups (layers).

3. Commonly understood industry terms and terms.
4. Terms related to the purely scientific method of the field.
5. Words and terms in the dialect related to the field.

Scientific words, terms, and concepts form the basis of the scientific method. In particular, the terms of a certain field are based on the precise naming of the object of this field, the phenomenon or the concept of science, its content, and the basis of the term. Based on this, the accuracy that is considered the object of the scientific method is achieved.

Each field of science works based on and relies on its own terms. In particular,

- 1) terms related to chemical technologies;
- 2) economic terms;
- 3) computer science terms;
- 4) physics terms;
- 5) terms related to mathematics;
- 6) botanical terms;
- 7) linguistic terms and others.

The terms related to this direction are slowly becoming popular, the lexicon is developing, and the meanings are expanding and becoming popular. The popularity of this phenomenon also depends on the types of terms.

Terms can be divided into two groups depending on the degree of popularization (understandability).

1) Science or field names that cover purely scientific terms. These are scientific terms popularized as names and are kept under special names. mathematics, grammar, chemistry, physics, linguistics, botany, anatomy, algebra; motor, element, system, battery, etc.

2) The terms and terms considered the internal structure and system of these "field names" are specialized terms of the field. For example, botanical terms.

When referring to botanical terminology, it is appropriate to talk about botanical terminology existing in our language, its lexical layer and synonymy in it, not as a new, developing terminology. Since since ancient times, botanical terms have existed in various dictionaries and historical sources, and its conceptual structure and corresponding terminological structure have a long history. It is appropriate to talk about



botanical terminology, its lexical layer and its synonymy. Since since ancient times, botanical terms have existed in various dictionaries and historical sources, and its conceptual structure and, accordingly, terminological structure have a long history.

A lot of opinions have been expressed in the scientific literature about the definition of the term. In almost all definitions, the term is described as a word or phrase expressing a special scientific and technical concept. According to O. Vinokur, the term is always clear and obvious. The language of the system of terms is formed consciously. After all, the term does not appear by itself, spontaneously, but is created due to its necessity, the existence of a need for it in society. According to A.S. Gerd, a term is a natural and artificial language unit, that is, a word or a combination of words, with a special terminological meaning that clearly and fully reflects the main features of existing concepts at a certain stage of scientific development (Gerd 1991;1-4).

O.S. Akhmanova says that terminology emerges only when a science reaches the highest level of its development, that is, the term is recognized after a specific concept acquires a clear scientific expression. An important means of distinguishing a term from a non-term is that it cannot be scientifically defined. V. G. Gak, along with giving a definition of the term, reveals its essence and determines the place of the term in the vocabulary of a language. He objects to the fact that the term is treated as a separate type of lexical units in scientific works and puts forward the idea that the term-function is a form of the use of lexical units (Gak 1972; 68-71). 6 V. P. Danilenko admits that the perception of any process occurring in society is first expressed in terminology or occurs as a result of the transformational change of certain terms (Danilenko 1971; 9). In the works of D.S. Lotte, it is emphasized that the term should be viewed and treated as a member of a specific system, not as a separate sign. According to his opinion, the systematic relations in the content plan determine the systemic nature of the terms. The place and position of terms in the system of terms is determined by the place and position of a certain concept in the system of concepts.

Terminology is considered as a set of special concepts, a set of special concepts, united into a system of terms, representing a categorical apparatus specific to different schools, scientific directions and specific ideas (Lotte 1961). In modern linguistics, there are various ideas and points of view regarding the emergence of new terms, obstacles in their implementation, principles and methods of creation. Substantial, functional, derivational, semantic and pragmatic principles of term interpretation are recognized. According to representatives of the substantive point of view, a term is a special word or a combination of words, which differs from other nominative units by its unambiguity, accuracy, systematicity, context-free, and emotional neutrality. According to the functional point of view, terms are not special words, but words with a special function; Any word can replace the term. The derivational point of view is closely related to the processes of formation of terms. According to the supporters of this idea, the term is recognized not only as a variant of a simple word, but also as a specially made unit with new, unique specific characters. The reasons for

the emergence of new terms are evaluated by the need to express new realities.

Certain requirements are imposed on the term, this aspect distinguishes it from ordinary words in the common language and dialects. Nomenclature is a new category of terminology. The nomenclature of any field includes all species names related to this field. When their amount reaches an excessive level, it requires a special structure. For example, trying to give a separate name to each of the more than 200,000 plant species today is useless, it is not even possible. From the nomenclature of natural sciences, which reflects the stages of human knowledge and understanding of nature, it is necessary to distinguish the technical nomenclature that is discovered and created by man (production nomenclature), as well as the commercial nomenclature, which is specially created for the purpose of providing and selling goods. will be Although all three nomenclatures are created by interested parties, they exist on the basis of different foundations, different goals and different principles.

A man-made item has names related to both production and trade. For example, the Volga passenger car had production names such as "GAZ-21", "GAZ-24", "GAZ-32". The truck (gruzovik) (type name) manufactured at the L-ikhachev enterprise in Moscow has the production number "ZIL130". In some cases, the same product or commodity produced internationally can have different meanings. For example, the M-20 light car produced in the former Soviet state was called Pobeda, and Warsaw in Poland. One of the main differences between nomenclature and terminology is that nomen are usually not recorded in terminological dictionaries or have a very limited place in dictionaries.

The drug acetylsalicylic acid with the official scientific name is widely popularized under the commercial name of aspirin, etc. In the course of the development of various fields of science, some nouns can pass into the system of terms, turn from pure lexical nominative units into logical (logical) information, information element, that is, the term of science. Nomenclature, although related to the concept, but it is incalculable. The quantity and number of the terminology of a specific science is clear, since they verbally express the system of concepts.

Polysemy and synonymy phenomena in terminology are not approved. However, despite this, the use of two or more synonyms (doublets) is sometimes noticeable in a number of terminological systems when expressing a certain item or concept. For example, in some works focused on issues of terminology, the words term-terminology are used in the form of a synonym nest. It is not a secret that after the Uzbek language was given the status of the state, as a result of some subjective points of view, the use of the term derivative instead of the term became active.

At first glance, it seems that it is better to use one's own word, which corresponds in all respects to international adoption. But a comparison of the definition of term acquisition and the scope of term formation shows that it is inappropriate to use both lexemes synonymously. At the time, A. Hajiyev seriously



considered the wrongness of replacing the word term with a term construction, its causes and consequences (Hajiyev 1996; 22-25). Taking this into account, the acquisition of the term is defined as words and phrases used in science, technical fields or branches, names (nomenclature, nomen) conditionally assigned to the term, in particular geographical objects, place names (toponyms), and the use of the Arabic istilah in relation to research in the aspect of historical terminology, concepts in the text of historical sources (Madvaliyev 2017; 28-30) justifies itself.

So, the terms embody a lexical layer that is fundamentally different from general literary words. This difference is reflected in the following main features: semiotic (in terms, the sign and the signifier enter into a symmetrical relationship); functional (terms are characterized not only by having a nominative, but also a definitive function); semantic (terms represent only special concepts, each of which is unique in its meaning); spread, popularization (only the entry of a certain part of terms related to the language of science into the general literary language does not prevent them from belonging to another system); ways and means of formation (in terminology, the movement of means of general literary language word formation is subject to the development of specialized, standard, stable models) (Danilenko 1977; 208).

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MANAGEMENT OF BREAST CANCER IN ECUADOR DURING THE COVID-19 PANDEMIC

Priscilla Lizbeth Pérez Jaramillo¹; Jenniffer Betzabeth Montoya Alcivar¹,
Nathaly Elizabeth Salinas Quito¹, Franklin Vinicio Fajardo Lapo¹,
Edgar Cristhelier Zambrano Ramírez¹, Darling Estefania Argudo Jima¹,
Jerson Amado Ochoa Asanza¹

¹Medicine, Technical University of Machala, Machala, ECU

²Hospital San Vicente de Paúl, Pasaje, ECU

Corresponding Author: Priscilla Lizbeth Pérez Jaramillo

Article DOI: <https://doi.org/10.36713/epra16063>

DOI No: 10.36713/epra16063

ABSTRACT

Breast cancer is the most common among women worldwide, accounting for 16% of all female cancers. Due to the new modality, in Ecuador, public health services have been restricted or are being carried out through telemedicine, which greatly affects patients suffering from cancer. The objective of this article is to establish the management of breast cancer during the COVID-19 pandemic, by reviewing the scientific literature from the last 4 years. For this research, the analytical - synthetic method was used and data collection techniques is the bibliographic - documentary. The search and review of scientific articles in indexed journals, published in the last 4 years, was carried out. Before making a decision about the management of the person with Ca, the risks of starting or continuing treatment against Ca should be discussed with him, taking into account that the therapies are most of the time systemic, increasing the risk of have further complications if you become infected with the coronavirus. In conclusion, for adequate management of women suffering from breast cancer, it is necessary to comply with the general recommendations for cancer patients, having the main concern in determining the risk benefit of the treatment, taking into account the patient's opinion about it, prior discussion on the subject with the patient. As a relevant point, the risk of contagion of Covid-19 must be minimized, complying with the protocols and reducing the visit time to the Health Center as much as possible. **Key words:** Breast cancer, management, treatment, covid-19, women.

KEY WORDS: Breast cancer, management, treatment, covid-19, women.

1. INTRODUCTION

Breast cancer (BC) is defined as the malignant proliferation of epithelial cells lining the mammary ducts or lobules, with the ability to spread to any part of the body. This disease, of multifactorial nature, involves genetic and environmental factors as contributing elements (1)(2).

Among the associated risk factors are a body mass index (BMI) exceeding 40, early menarche (before 12 years old), a history of respiratory-tumoral conditions, nulliparity or insufficient parity, first pregnancy after the age of 35, lack of or brief breastfeeding, use of estrogen for more than 5 years, and a family history of breast cancer or other types such as ovarian and uterine cancers (2).

The most common clinical findings in BC are characterized by the presence of a lump or thickening in the breast, alterations in size, shape, and appearance of the breast, recent nipple inversion, redness in that area, and the presence of axillary lymphadenopathy. The diagnosis of this pathology is carried out through a comprehensive clinical evaluation and imaging studies such as mammography, breast ultrasound, and

magnetic resonance imaging, complemented by specific tests for tumor markers and biopsies (3).

While consultations for breast pathology are frequent among women, the majority of cases are benign (4). However, breast cancer is the most prevalent among women globally, representing 16% of all female cancers. In 2008, 1.38 million new cases were diagnosed, with 60% of deaths occurring in developing countries (5)(6).

In Ecuador, according to the 2018 Globocan statistics, there were 28,058 new cancer cases, averaging 165 cases of cancer of all types per 100,000 women. Breast cancer was the most common, with 2,787 cases (18.2%) (7). This disease ranks third as a cause of cancer-related deaths in the country, following prostate and stomach cancers. The survival rate for breast cancer during the period 2010-2014 was 75% (8).

Early-stage, non-metastatic breast cancer is potentially curable. After diagnosis, management should be determined by a multidisciplinary team, considering subtypes such as



triple-negative or HER2, for which primary systemic therapy may be the most suitable option (9).

An analysis of 928 individuals with cancer and COVID-19 revealed that having active and progressive cancer is associated with a 5 times higher risk of mortality within the first 30 days compared to patients in remission (5). Given the new mode of public health services in Ecuador, often conducted through telemedicine, breast cancer patients, considered vulnerable due to compromised immunity, must take into account specific measures during the pandemic, evaluating the risk-benefit and safety of treatments (10).

Amid the COVID-19 pandemic, oncologists must weigh the risks of the SARS-CoV-2 virus to prioritize the administration of cancer therapies, considering therapeutic intent, patient conditions, and the availability of healthcare personnel (11).

2. OBJETIVE

Elucidate the management of breast cancer during the COVID-19 pandemic through a review of scientific literature, for a better understanding of the topic and improve the care of patients with this pathology.

3. METHODOLOGY

The method used in this study is the analytical-synthetic approach, and the data collection techniques are bibliographic-documentary. The search and review of scientific articles in indexed journals on the management of breast cancer during the Covid-19 pandemic were conducted over the last 4 years, utilizing databases obtained from electronic search engines such as PubMed. The search, conducted in English, used keywords "breast cancer" and "COVID-19" during the months of August to October 2020. Preference was given to articles from journals with Quartiles Q1-Q3.

4. RESULTS

RECOMMENDATIONS FOR THE MANAGEMENT OF ONCOLOGICAL PATIENTS

In June 2020, the Ministry of Public Health of Ecuador issued recommendations for the management of cancer patients. In these guidelines, it is emphasized that before making decisions regarding the management of individuals with cancer, discussions should be held with them regarding the risks of starting or continuing cancer treatment. It is crucial to consider that most therapies are systemic, increasing the risk of complications if the patient becomes infected with the coronavirus. Therefore, the safety of oncology patients should be a priority, given their state of immunosuppression (10).

Among the steps for the personal protection of cancer patients and caregivers recommended by the Ministry of Public Health (MSP), we have: (See Table 1 and 2).

Additionally, other recommendations should be taken into account, such as cancer patients avoiding exposure to situations of Covid-19 infection risk by staying at home. Special attention should be paid to symptoms such as cough, fever, shortness of breath, myalgias, chills, nausea, diarrhea,

runny nose, and vomiting within two weeks of contact with someone exhibiting these symptoms. Patients should contact their doctor or reference health center if they experience symptoms such as dry cough, chills with or without fever, shortness of breath, and throat irritation (12).

MANAGEMENT OF ONCOLOGICAL PATIENTS

To decide on the most appropriate management for oncological patients, it is necessary to identify individuals at higher risk and susceptibility. This prioritization should consider factors such as the type of cancer, age group, potential treatment benefit, therapeutic goal, impact of treatment delays or interruptions, availability of healthcare personnel, chemotherapy toxicity, immunosuppression, and thoracic radiotherapy affecting pulmonary function. Treatment may be deferred or virtual follow-ups for stable patients can be considered (11). (See Table 3).

For the prioritization of patients requiring systemic cancer therapy, the following steps should be taken: a) Classify patients based on treatment intent and associated risk-benefit relationship. b) Consider alternative and less intensive treatment regimens. c) Explore alternative methods for monitoring and reviewing patients receiving systemic therapies. Additionally, clinical oncologists should consider the level of immunosuppression associated with individual therapy and other patient risk factors (10).

RECOMMENDATIONS FOR THE MANAGEMENT OF BREAST CANCER

For the management of patients with breast cancer (BC), priorities must be established, which should be flexible according to the location and resources available. Outpatients with BC should be included in the urgent care approach since many of them will require treatment (8).

In deciding on in-person medical care and treatment, priorities should be based on the principles of non-maleficence, beneficence, and justice, considering two elements: patient need and treatment efficacy (8). Taking these considerations into account, patient decisions can be classified as follows: (See Table 4).

In the general recommendations for women with mammary oncological pathology, the same considerations apply to oncological patients in general. During the COVID-19 pandemic, indications for hormonal therapy in low-risk patients were temporarily reconsidered, taking into account the availability of facilities and healthcare resources, the number of necessary hospital visits, and the risks associated with compromising the immune system due to different types of treatments (13).

Therapeutic management behavior will depend on the clinical subtype and its severity, in addition to therapeutic approaches that include endocrine therapy, anti-HER2 therapy. There is a recommendation for increased use of radiotherapy or chemoradiation instead of surgical treatment, which poses a higher risk in these patients. Additionally, psychological care



should be provided to BC patients during the SARS-CoV-2 pandemic (13).

5. DISCUSSION

The Ministry of Public Health (MSP) and the Ecuadorian Society of Obstetrics (SOE) recommend minimizing visits by cancer patients to Health Centers to reduce exposure to the SARS-CoV2/Covid-19 virus. Similarly, Al-Shamsi et al., in their publication in *The Oncologist* on March 16, 2020, advocate for minimizing outpatient visits for cancer patients as much as possible to mitigate the risk of Covid-19 infection. Moreover, endorse the MSP's general recommendations on hand hygiene, infection control measures, and monitoring Covid symptoms for patients who have been in contact with symptomatic individuals (14).

In the prioritization classification for breast cancer patient care by the SOE, three priorities (high, medium, and low) have been defined based on patient needs, along with six types of treatment efficacy-related priorities. Similarly, Azambuja E., et al., in their publication on April 26, 2020, establish three priorities for determining patient management (13). Furthermore, Ng CWQ., et al., delineate in their article that prioritizing breast oncology patients should involve a four-phase approach, tailored to the patient's illness needs, with Phase 1 indicating the lowest risk of complications and Phase 4 posing the highest risk of mortality (15).

The provided information underscores the critical considerations and guidelines for managing oncological patients during the Covid-19 pandemic, particularly focusing on the recommendations from the Ministry of Public Health of Ecuador. These guidelines highlight the importance of a patient-centered approach, considering the increased vulnerability of individuals with cancer due to their immunosuppressed state. The following key points are discussed:

Prioritization and Flexibility in Cancer Care: The Ministry of Public Health emphasizes the need for flexibility in establishing priorities for cancer care, recognizing the diverse settings and resources available. Outpatients with cancer are specifically mentioned as needing urgent attention due to potential treatment requirements (8).

Personal Protection Measures: Tables 1 and 2 outline personal protection measures for cancer patients and their caregivers. These guidelines provide practical steps to mitigate the risk of Covid-19 exposure, considering the systemic nature of cancer therapies that may increase susceptibility to complications.

Patient Communication and Monitoring: Recommendations urge oncology patients to avoid potential infection sources, stay at home, and be vigilant about Covid-19 symptoms. Early communication with healthcare providers is encouraged to address concerns promptly (12).

Treatment Decision-making and Prioritization Criteria: The discussion emphasizes the complexity of deciding on the most appropriate management for oncological patients. Prioritization criteria, including cancer type, age, potential treatment benefit, and availability of healthcare resources, are crucial factors. The guidelines highlight the need for considering alternative and less intensive treatment regimens and exploring virtual follow-ups for stable patients (11).

Systemic Therapy and Immunocompromised Patients: The guidelines acknowledge the temporary reconsideration of hormonal therapy in low-risk patients during the pandemic, considering healthcare facility availability and potential immunosuppression risks associated with various treatments (13).

Patient Classification and Alternative Monitoring: To prioritize patients for systemic cancer therapy, a classification based on treatment intent and risk-benefit analysis is recommended. Exploring alternative monitoring methods and considering patient immunosuppression levels are crucial aspects of decision-making (10).

6. CONCLUSION

The managing oncological patients during the Covid-19 pandemic required a nuanced and patient-specific approach. The provided recommendations prioritize patient safety, ensuring that treatment decisions consider the unique challenges posed by the pandemic. The emphasis on flexibility, communication, and alternative strategies reflects a comprehensive effort to balance cancer care with the realities of the ongoing global health crisis.

For proper management of women with breast cancer, it is necessary to adhere to general recommendations for oncology patients, with a primary focus on determining the risk-benefit ratio of treatment, taking into account the patient's opinion after discussing the matter with her. As a crucial point, minimizing the risk of Covid-19 transmission is essential by following protocols and minimizing the time spent at the Health Center as much as possible



7. TABLES

Table 1
Recommendation management of oncology patient in Covid 19

RECOMMENDATIONS
Hand washing with soap and water or with a 70% alcohol-based solution.
Covering the mouth when coughing or sneezing with a tissue or paper, disposing of it, and washing hands.
Avoiding touching the face with unwashed hands.
Cleaning and disinfecting objects or surfaces frequently..
Avoiding close contact with people and maintaining a distance of more than 1 meter between each other (avoiding crowded places, gatherings, especially indoors, and avoiding contact with someone who has cough, fever, or difficulty breathing).
Not sharing objects that touch the mouth, such as bottles, glasses, or cups.
Avoiding handshakes.
Practicing social distancing.

Note: Recommendations for the management of oncology patients during the SARS-CoV2/Covid-19 pandemic, Ministry of Public Health of Ecuador, 2020. pp. 11-12.

Table 2
Recommendations for caregivers of oncology patients in Covid 19

Recommendations for caregivers of oncology patients
Caregivers of cancer patients should adhere to standard precautionary guidelines such as hand washing, respiratory hygiene measures, waste management, equipment sterilization, etc.
Ensure that all patients cover their mouth and nose when sneezing or coughing.
Establish separate rooms for the admission of oncology patients suspected of Covid-19 or maintain at least 1 meter of distance between beds.
Healthcare providers for cancer patients should wear clean and sterile personal protective equipment.
Limit the use of aerosol-generating procedures and equipment in cancer patients.
Perform hand hygiene after visiting each patient.

Note: Adapted from Recommendations for the management of oncology patients during the SARS-CoV2/Covid-19 pandemic, Ministry of Public Health of Ecuador, 2020. pp. 11-12

Table 3
Risk Factors Management of Oncology Patient In Covid 19

RISK FACTORS	
PATIENTS AT HIGHER RISK OF SEVERE COVID-19 ILLNESS	<ul style="list-style-type: none"> • Individuals receiving active chemotherapy or radiation therapy. • Individuals with leukemias, lymphomas, multiple myeloma, at any stage of treatment. • Individuals receiving immunotherapy or other continuous antibody treatments for cancer. • Individuals receiving other cancer-targeted treatments affecting the immune system, such as protein kinase inhibitors or PARP inhibitors. • Individuals who have undergone bone marrow or stem cell transplants in the last 6 months, or are still taking immunosuppressive medications.
ACTORS ASSOCIATED WITH WORSE PROGNOSIS	<ul style="list-style-type: none"> • Individuals over 60 years of age. • Pre-existing cardiovascular disease. • Pre-existing respiratory disease.
<i>Note:</i> Adapted from National Health Service (NHS). Clinical guide for the management of cancer patients during the coronavirus pandemic. NHC. 2020; pag. 1–8.	



Table 4
Consideration management of oncology patient in Covid 19

Considerations		
Need	Severity of symptoms	<ul style="list-style-type: none"> • Uncontrolled pain • Potentially life-threatening complications of the disease
Effectiveness	<ul style="list-style-type: none"> • Treatment effectiveness • Control of unstable or potentially life-threatening situations 	
Note: Adapted from Soria T., et al. Recommendations for the management of breast cancer patients during the SARS-COV-2/COVID-19 pandemic.		

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COMPARATIVE ANALYSIS OF COSTS AND RETURNS ACROSS FARM SIZES FOR SUGARCANE PRODUCTION IN MANDYA DISTRICT, KARNATAKA

Manju.K¹, Dr.M.V Dinesha²

¹Research scholar, DoS in Economics and Cooperation, Manasagangotri, University of Mysore, Mysuru-570006

²Associate Professor, DoS in Economics and Cooperation, Manasagangotri, University of Mysore, Mysuru-570006

Article DOI: <https://doi.org/10.36713/epra16105>

DOI No: 10.36713/epra16105

ABSTRACT

The study examines the cost and returns of sugarcane cultivation across various farm sizes. The study indicates that the total cost of cultivation tends to vary across different farm sizes, with marginal farms incurring the lowest cost and large farms incurring the highest. It also highlights cost variations between main and ratoon crops, emphasizing labor, material, and power costs. Larger farms incur higher production costs but yield greater net returns, with ratoon crops generally more profitable. ANOVA analysis underscores significant differences in costs and returns among farmer categories. Despite the main crop's higher productivity, lower returns compared to ratoon crops contribute to the latter's continuity. The paper concludes that the profitability of the ratoon crop serves as a key incentive for continuing sugarcane cultivation despite the higher costs associated with the main crop.

KEYWORDS: Sugarcane, Cost, Returns, Ratoon and Main crop

INTRODUCTION

Agriculture plays an important role in every economy. In India agriculture considered has the backbone of the country and despite concerted industrialization in the last seven decades, agriculture still occupies a place of pride. The significance of agriculture in the national economy can be best explained by considering the role of agriculture under different heads. From the monetary point of view, agriculture sector in the economy contributes 17.4 percent of the GDP of the country in 2019-20. In the fiscal year 1950-51 agriculture accounted for 55.4 percent of the GDP. The share of the agriculture has been falling in the country's gross income while industrial and services sectors shares have been on a rise constantly. But from the livelihood point of view still 48.7 percent of the people of India depend on the agriculture sector. It shows that agriculture sector is still important than the industry and the services sectors. Agriculture still contributes significantly to India's GDP despite of its declining trend. (Economic survey 2019-20)

Farmers grow wide variety of crops. These include food crops, commercial crops, oilseeds etc., Sugarcane is one of the most important commercial crops grown in India. In India, Karnataka stands 3rd in cane production next to Uttar Pradesh and Maharashtra States and 2nd with respect to sugar recovery after Maharashtra. Sugarcane is grown in 16 districts of the state. Belgaum, Bagalkot, Bijapur, Mandya, Mysore, Chamarajanagar and Bidar are the major sugarcane producing districts in Karnataka.

Sugarcane production in Mandya District, Karnataka, plays a pivotal role in the region's agricultural landscape and economy. This comparative analysis aims to explore the costs and returns

associated with sugarcane farming across various farm sizes. Mandya District is renowned for its diverse farming practices, and understanding the financial dynamics of sugarcane cultivation across different scales of operation is essential for informed decision-making among farmers and policymakers. By examining the cost structures, revenue streams, and profitability metrics, this study seeks to provide valuable insights into the comparative efficiencies and challenges faced by sugarcane producers, contributing to the sustainable development of agriculture in the region.

REVIEW OF LITERATURE

Verma L.K & Solanki A (2020) in their study revealed the cost of cultivation of sugarcane was amounted as 87491.30 Rs/ha. major share of cost of cultivation gone to human labour cost being 40.20 percent. The net return against the cost of cultivation observed Rs 136941.07 ha. The input-output ratio of sugarcane came to 1:2.56. The study suggested that during peak period of agricultural operation the unavailability of sufficient labours and available at very high cost. To avoid the escalation of cost and better use of inputs mechanization may be encouraged.

Kumar T (2014) in their study emphasized that per hectare cost of sugarcane (planted) was Rs. 89712.33, net returns amounted to Rs. 16914.66/ha, the cost of production per quintal was estimated to be Rs 160.91 and the profit margin was Rs. 42.35. The estimated per hectare cost of sugarcane (ratoon) was Rs. 78668.60, net returns amounted to Rs. 85741.30/ha, the cost of production per quintal was estimated to be Rs. 98.00 and the profit margin was Rs. 106.94. The benefit cost analysis of the sugarcane (planted) fetched 1.18 times return over cost



invested, whereas in sugarcane (ratoon) fetched 2.08 times returns over cost invested.

Saravanan A (2016) in his study found that an average sugarcane cultivating farmer in the area spent 14.40 percent of the total cost on seed, 5.32 percent (appropriated cost) on family labour, 64.96 percent on hired labour, 5.67 percent on machinery used for different operations, 6.04 percent on chemical fertilizer and 3.61 percent on pesticide, realised a net return of Rs.26424 per acre. This might be due to the fact that the benefit of economies of scale has reached its maximum only at the farm size of 5-7.5 acres. The study recommended that can improve cropping system and stabilizes farm income to the farmers; the Government intervention is sought in a manner that there is unbiased credit support for farms of all categories without discrimination.

RESULTS AND DISCUSSIONS

Cost of cultivation of sugarcane under different farm size (Rs/Acre) in planted crop

Particular	Marginal	Small	Semi-Medium	Medium	Large	Overall
Seed	9369.88 (16.69)	9342.87 (16.13)	10887.91 (18.62)	11500.78 (19.17)	9200.45 (14.40)	9620.97 (17.03)
Fertilizer& Manure	23460.22 (40.55)	23045.46 (39.79)	22450.99 (38.40)	26500.24 (44.19)	26250 (41.11)	22854.39 (40.46)
Pesticides& Insecticides	2108.89 (3.64)	2000.45 (3.45)	1651.80 (2.82)	1800.05 (3.00)	1750 (2.74)	1813.86 (3.21)
Total Material cost (A)	34939 (60.40)	34388.79 (59.38)	34990.70 (59.85)	39801.08 (66.37)	37200.45 (58.26)	34289.23 (60.70)
Family Labour	6741.9 (11.66)	6731.86 (11.62)	7198.69 (12.31)	5950.35 (9.92)	8500 (13.31)	6402.41 (12.09)
Hired Labour	7955.49 (13.75)	7996.83 (13.80)	7320.13 (12.52)	6815.38 (11.36)	6800 (10.64)	7796.87 (13.80)
Total Human Labour (B)	14697.39 (25.41)	14728.69 (25.43)	14518.82 (24.83)	12765.73 (21.29)	15300 (23.96)	14402.12 (24.80)
Animal Labour	3771.56 (6.52)	4189.30 (7.23)	4355.31 (7.44)	3600.05 (6.00)	3850 (6.02)	4009.84 (7.09)
Machine Labour	4437.46 (7.67)	4602.54 (7.94)	4597.26 (7.86)	3800.12 (6.33)	7500 (11.74)	4987.47 (8.58)
Total power use cost (C)	8209.02 (14.19)	8791.84 (15.18)	8952.57 (15.31)	7400.17 (12.34)	11350 (17.78)	8940.72 (15.39)
TC (A+B+C)	57845.42	57909.34	58462.10	59966.75	63850.45	58083.23

Table 1 revealed that per acre cost of production of sugarcane planted for the year 2020-21. It was observed that on total cost of production per acre was Rs.58083.23 and among the farm size it was Rs.57845.42, Rs.57909.34, Rs.58462.10, Rs.59966.75 and Rs.63850.45 on marginal, small. Semi-medium, medium and large farmers, respectively. It showed that the cost of production increased directly with the farm size. Thus, it could be concluded that total cost of cultivation was increasing with respect to farm size holding due to bigger farmers could incurred more expenditure on the material inputs. (Verma. L.K. 2020)

METHODOLOGY

Present study is carried out in Mandya&Maddur thaluks of Mandya district as area under sugarcane cultivation was maximum in these two thaluk and K.R Pete &Malavalli thaluk as less area under sugarcane cultivation except Nagamangala thaluk due to very less irrigation facilities for Nagamangala thaluk. From the selected fourthaluks, a list of the farmers was prepared and a sample of 182, 126, 77, 13 and 2 farmers (total 400) from each size group, i. e Marginal (up to 1 ha). small (1 to 2 ha), semi-medium (2 to 5 ha), medium (5 to 10 ha) and large (> 10 ha) was selected in their probability proportion for the collection of data. The sugarcane cultivators were classified into two groups on the basis of type of sugarcane grown i.e. main crop of sugarcane (189 cultivators) and ratoon sugarcane (211 cultivators). The data related to the agricultural year 2021-2022 were collected by personal interviews with the sugarcane cultivators.

In total cost the shares was found to be maximum in material cost 60.70 percent followed by human labour cost 24.80 percent, cost of total power used was observed to be 15.39 percent respectively. In material cost, the share of fertilizer & manure was 40.46 percent and seed 17.03 percent was noticed to be the major cost. While human labour cost, the share of hired cost being 13.80 percent was comparatively more than that of family labour cost 12.09 percent. The share of machine power 8.58 percent was more than that of bullock power 7.09 percent.



Cost of cultivation of sugarcane under different farm size (Rs/Acre) in Ratoon crop

Particular	Marginal	Small	Semi-Medium	Medium	Large	Overall
Seed	0	0	0	0	0	0
Fertilizer & Manure	14680.75 (36.68)	15420.36 (37.28)	15680.57 (37.19)	16875.45 (37.81)	17025.87 (36.93)	15936.6 (37.19)
Pesticides & Insecticides	2300.25 (5.74)	2745.69 (6.63)	2520.78 (5.97)	2678.45 (6.00)	2985.63 (6.47)	2646.16 (6.17)
Total material cost (A)	16981 (42.43)	18166.05 (43.91)	18201.35 (43.17)	19553.9 (43.82)	20011.5 (43.41)	18582.76 (43.36)
Hired Labour	12560.45 (31.38)	12895.57 (31.17)	13050.58 (30.95)	13515.85 (30.29)	14250.23 (30.91)	13254.54 (30.93)
Family Labour	6548.24 (16.36)	7100.24 (17.16)	7058.89 (16.74)	7900.85 (17.70)	7980.45 (17.31)	7317.73 (17.07)
Total human labour (B)	19108.69 (47.75)	19995.81 (48.34)	20109.47 (47.70)	21416.7 (47.99)	22230.68 (48.22)	20572.27 (48.00)
Animal Labour	1526.21 (3.81)	1825.48 (4.41)	2005.56 (4.75)	2650.25 (5.93)	2854.23 (6.19)	2172.34 (5.06)
Machine Labour	2400 (5.99)	2564.2 (6.19)	2600.58 (6.16)	2815.15 (6.30)	2850.45 (6.18)	2646.09 (6.17)
Total power use cost (C)	3926.21 (9.81)	3200.54 (7.73)	3845.62 (9.12)	3650.25 (8.18)	3854.23 (8.36)	3695.37 (8.62)
TC (A+B+C)	40015.9	41362.4	42156.44	44620.85	46096.41	42850.4

Table 1 revealed that per acre cost of production of sugarcane planted for the year 2020-21. It was observed that on total cost of production per acre was Rs.42850.4 and among the farm size it was Rs.40015.9, 41362.4, 42156.44, 44620.85 and 46096.41 on marginal, small, Semi-medium, medium and large farmers, respectively. It showed that the cost of production increased directly with the farm size. Thus, it could be concluded that total cost of cultivation was increasing with respect to farm size holding due to bigger farmers could incurred more expenditure on the material inputs. (Verma. L.K. 2020)

In total cost the shares was found to be maximum in human labour cost 48.00 percent followed by material cost 43.36 percent, cost of total power used was observed to be 8.62 percent respectively. In material cost, the share of fertilizer & manure

was 37.19 percent and pesticides & insecticides 6.17 percent was noticed to be the major cost. While human labour cost, the share of hired cost being 30.93 percent was comparatively more than that of family labour cost 17.07 percent. The share of machine power 6.17 percent was more than that of bullock power 5.06 percent.

1. There is a significant difference in cost of sugarcane production by different categories of farmers in Mandya district.

To test whether the cost of sugarcane production is same across different categories farmers or not, the Analysis of Variance (ANOVA) test has been used and the results have been presented below.

Descriptive statistics of cost of sugarcane cultivators across different categories of farmer

Categories of farmer	N	Mean	Std. Deviation	Std. Error
Marginal farmer	182	48930.66	8666.286	642.3879
Small farmer	126	49635.87	8196.28	730.1827
Semi-medium farmer	77	50309.27	6093.851	694.4588
Medium Farmer	13	52293.80	9046.367	2509.011
Large farmer	2	54973.43	9223.372	9223.372
Total	400	50466.81	8178.529	408.9265

Source : Field survey

The table presents the descriptive statistics of cost of sugarcane cultivators across different categories of farmer. The results show the average cost of sugarcane to different categories farmer and we can see that the average cost of sugarcane production to large farmer is the highest (Rs. 54973.43) followed by the medium farmer (Rs. 52293.80). As shown by

the standard deviation, the variation in the cost of sugarcane to these categories of farmer is high for the medium and large farmers as compared to semi-medium, small and marginal farmer.



ANOVA test for cost of sugarcane cultivators across different categories of farmer

Variations	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	676237409.822	4	169059352.456	2.567	.038
Within Groups	26012209280.680	395	65853694.381		
Total	26688446690.502	399			

Source : Field survey

The table presents the results of ANOVA test. The results reveal that there is a significant difference in the cost of sugarcane production across different categories of farmer in Mandya district. It is observed by the calculated value of 'F' which is 2.567 and a probability value of 0.038 which is statistically significant at 5% level of significance. But one of the limitations of ANOVA test is that though it tells us that there is a significant difference in cost of sugarcane production across different categories of farmer, it doesn't tell us which sector is

statistically significantly different from other categories of farmer in terms of cost incurred. It fails to explain whether there exists a significant difference among all categories of farmers or not and also whether there is similarity or same cost of sugarcane production among few farmers or not. Hence, to see which category of farmer is statistically different from others in terms of cost of sugarcane production incurred, Post Hoc Test developed by Duncan is used and results are presented in the table below.

Post Hoc Duncan Test for cost of sugarcane cultivators across different categories of farmer

Groups	N	Subset for alpha = 0.05	
		1	2
1	182	48930.66	
2	126	49635.87	
3	77	50309.27	
5	2		52293.80
4	13		54973.43
Sig.		.252	.146

Means for groups in homogeneous subsets are displayed.

Source : Field survey

The results reveal that the test divides the five categories of farmer into two groups which means there is homogeneity (same means between 1st, 2nd and 3rd groups) within groups. Though there is a difference in the mean cost of sugarcane on these 3 categories, statistically there is no significant difference. But the other groups (4th and 5th) are significantly different from the other groups. There is no statistical difference in the mean

cost of sugarcane production on 1st group and 2nd group but there are statistically different from rest of the groups. It just means that variations exist between groups and not within groups in terms of cost of sugarcane production on different categories of farmer. Thus, the Post Hoc test grouped cost of sugarcane production on 5 categories of farmer into 2 groups.

RETURNS OF SUGARCANE PRODUCTION

Net returns of sugarcane production in planted crop

Particular	Marginal	Small	Semi-Medium	Medium	Large	Overall
TC	57845.42	57909.34	58462.1	59966.75	63850.45	59606.81
Yield	60.24	61.58	62.52	65.23	69.85	63.884
Gross Return	111444	113923	115662	120675.5	129222.5	118185.4
Net Return	53598.58	56013.66	57199.9	60708.75	65372.05	58578.59
Cost Of Production (Rs/Tonne)	960.24	940.392	935.09	919.31	914.10	933.83
B:C	1 :1.93	1 :1.97	1 :1.98	1 :2.01	1 :2.02	1 :1.98

Estimated yields per acre of sugarcane planted on marginal, small, semi-medium, medium and large size of farms averaged to 60.24, 61.58, 62.52, 65.23 and 69.85, respectively, with an average of 63.88.

The average gross returns were Rs.111444, Rs.113923, Rs.115662, Rs.120675.5 and Rs.129222.5/acre on marginal, small, semi-medium, medium and large size farms, respectively, with an average of Rs.118185.4/acre.

The net returns per acre were Rs.53598.58, Rs.56013.66, Rs.57199.9, Rs.60708.75 and Rs.65372.05/acre on marginal, small, semi-medium, medium and large size farms, respectively with an average of Rs.58578.588. The higher net returns of medium and large farms were due to the higher yields and low cost of production on large farms. However, no much difference was observed in the per tonne cost of sugarcane production among the categories. The cost of cane production per tonne was 933.83, while it was Rs. 960.24, Rs.940.39, Rs.935.09,



Rs.919.31 and Rs.914.10. the benefit cost ratio of the sugarcane planted 1.93, 1.97, 1.98 2.01 and 2.02 with an average of 1.98.

Net returns of sugarcane production in Ratoon crop

Particular	Marginal	Small	Semi-Medium	Medium	Large	Overall
TC (Rs/acre)	40015.9	41362.4	42156.44	44620.85	46096.41	42850.40
Yield (q/acre)	52.24	54.52	55.98	59.46	62.12	56.86
Gross return (Rs/acre)	96644	100862	103563	110595.6	114922	105317.32
Net return (Rs/acre)	56628.1	59499.6	61406.56	65974.75	68825.59	62466.92
Cost of cane production (Rs/tonne)	766.00	758.66	753.06	750.43	742.05	754.04
B:C	1 :2.42	1 :2.44	1 :2.46	1 :2.48	1 :2.49	1 :2.46

Estimated yields per acre of sugarcane ratoon on marginal, small, semi-medium, medium and large size of farms averaged to 52.24, 54.52, 55.98, 59.46 and 62.12, respectively, with an average of 56.86.

The average gross returns were Rs.96644, Rs.100862, Rs.103563, Rs.110595.6 and Rs.114922/acre on marginal, small, semi-medium, medium and large size farms, respectively

The net returns per acre were Rs.53598.58, Rs.56013.66, Rs.57199.9, Rs.60708.75 and Rs.65372.05/acre on marginal,

small, semi-medium, medium and large size farms, respectively with an average of Rs.58578.588. the higher net returns of medium and large farms were due to the higher yields and low cost of production on large farms. However, no much difference was observed in the per tonne cost of sugarcane production among the categories. The cost of cane production per tonne was Rs.933.83, while it was Rs. 960.24, Rs.940.39, Rs.935.09, Rs.919.31 and Rs.914.10/acre on marginal, small, semi-medium, medium and large size farms, respectively. The benefit cost ratio of the sugarcane planted 1.93, 1.97, 1.98 2.01 and 2.02 with an average of 1.98.

2. There is a significant difference in returns of sugarcane production by different categories of farmers in Mandya district.

Descriptive statistics of returns of sugarcane cultivators across different categories of farmer

Categories of farmer	N	Mean	Std. Deviation	Std. Error
Marginal farmer	182	55113.34	7466.629	553.4634
Small farmer	126	57756.63	9015.406	803.1562
Semi-medium farmer	77	59303.23	9664.553	1101.378
Medium Farmer	13	63341.75	9610.755	2665.544
Large farmer	2	67098.82	14848.49	10499.47
Total	400	60522.75	8680.418	434.0209

Source : Field survey

The table presents the descriptive statistics of returns of sugarcane cultivators across different categories of farmer. The results show the averagereturns of sugarcane to different categories farmer and we can see that the average returns of sugarcane production to large farmer is the highest

(Rs.67098.82) followed by the medium farmer (Rs.63341.75). As shown by the standard deviation, the variation in the returns of sugarcane to these categories of farmer is high for the medium and large farmers as compared to otherfarmer.

ANOVA test for returns of sugarcane cultivators across different categories of farmer

Variances	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	1386419878.88	4	346604969.72	4.774	.001
Within Groups	28678092783.72	395	72602766.541		
Total	30064512662.60	399			

Source : Field survey

The table presents the results of ANOVA test. The results reveal that there is a significant difference in the returns of sugarcane production across different categories of farmer in Mandya district. It is observed by the calculated value of 'F'

which is 4.774 and a probability value of 0.001 which is statistically significant at 5% level of significance.



Post Hoc Duncan Test for returns of sugarcane cultivators across different categories of farmer

	N	Subset for alpha = 0.05	
		1	2
Marginal farmer	182	55113.34	
Small farmer	126	57756.63	
Semi medium farmer	77	59303.23	
Large farmer	2		63341.75
Medium farmer	13		67098.82
Sig.		.052	.062
Means for groups in homogeneous subsets are displayed.			

Source : Field survey

The post hoc Duncan test was employed to assess the returns of sugarcane cultivators across various categories of farmers. The analysis revealed five distinct categories into two groups. There is homogeneity in marginal, small, semi-medium farmer within groups. Though there is difference in mean returns of sugarcane on these 3 categories farmer. There is no statistically significant difference. But the other categories medium and large farmers are significantly different from the other groups. There is no statistical difference in the mean returns of sugarcane farmer. But, there is statistically different between 1st group and 2nd group. It just means that variations exist between groups and not within groups in terms of returns of sugarcane production on different categories of farmer. Thus, the Post Hoc test grouped returns of sugarcane production on 5 categories of farmer into 2 group.

CONCLUSION

The study found that cost of sugarcane production of main crop was Rs.933.83/ tonne and higher than that of ratoon Rs.754.04/tonne. Low cost of cultivation was due to exclusion of seed and land preparation cost. Similarly, net returns from an acre of land for main crop was found to be Rs.58578.59 which was lower than ratoon crop Rs. 62466.92. The productivity of main crop was higher than ratoon crop. The average productivity of main crop 63.88 tonnes/acre whereas ratoon yielded 56.86tonnes/acre. The lower productivity of ratoon crop in the study area was due to low input application and careless management of ratoon crop. The similar results found in the study of Pandey amith.2020.

The B : C ratio of main crop was 1.98 while it was 2.46 for ratoon crop. Thus, the profit from ratoon crop was the main reason for the continuity of sugarcane cultivation. The overall B:C including main and ratoon crop was 2.22. Thus, study revealed that despite of higher cost and low benefit from main crop, lower cost and higher benefit from ratoon crop was reasons behind continuing the sugarcane production. The result was in line with study of pandey amith.2020 which reported the B:C ratio of 1.35 for sugarcane cultivation in Nepal.

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GROUNDWATER AND ECOSYSTEMS: UNDERSTANDING THE CRITICAL INTERPLAY FOR SUSTAINABILITY AND CONSERVATION

Mustaq Shaikh¹, Farjana Birajdar²

¹Assistant Geologist, Groundwater Surveys and Development Agency, Solapur, GoM, Solapur, India

²Assistant Professor, School of Earth Sciences, Punyashlok Ahilyadevi Holkar Solapur University, Solapur, India

Article DOI: <https://doi.org/10.36713/epra16111>

DOI No: 10.36713/epra16111

ABSTRACT

Groundwater, a vital component of the Earth's hydrological cycle, plays a central role in supporting ecosystems worldwide. This research paper explores the multifaceted relationship between groundwater and ecosystems, emphasizing its critical importance for the health and resilience of both aquatic and terrestrial habitats. The paper delves into the ecosystem services provided by groundwater, including habitat provision, water purification, and nutrient cycling. The intricate connection between groundwater availability and biodiversity is examined, highlighting the significance of groundwater in sustaining diverse habitats such as wetlands, springs, and riparian zones. Additionally, the research investigates the role of groundwater in hydrological processes, particularly its contribution to base flow in rivers and the sustenance of stream ecosystems during dry periods. Anthropogenic factors leading to groundwater depletion, such as over-extraction for agriculture and urbanization, are analyzed, emphasizing the far-reaching consequences for ecosystems. The paper proposes strategies for sustainable groundwater management, including monitoring, water-efficient agricultural practices, and nature-based solutions. It underscores the importance of policy development, community engagement, and international collaboration in preserving groundwater-dependent ecosystems. Looking towards the future, the research identifies challenges and opportunities, including uncertainties related to climate change, population growth, and global water trade. It suggests areas for further research, such as integrated hydrological models and studies on social-ecological systems, and emphasizes the need for innovative policies that prioritize ecosystem health. In conclusion, the research emphasizes the critical need for sustainable groundwater management practices, recognizing groundwater as a finite resource essential for maintaining biodiversity, ecosystem functionality, and human well-being.

KEYWORDS: Biodiversity, Ecosystems, Groundwater, Sustainability, Water Management.

INTRODUCTION

Groundwater, a vital part of Earth's water cycle, is stored in aquifers and plays a crucial role in supporting diverse ecosystems. It is stored beneath the surface in soil and rock formations, originating from precipitation, infiltration, and percolation. Aquifers, composed of materials like sand, gravel, or porous rock, store and transmit groundwater, influencing the balance of ecosystems. Groundwater is influenced by geological, climatic, and hydrological factors, with approximately 30% of the Earth's freshwater stored beneath the surface. However, the quality and quantity of groundwater are subject to the impact of human activities and climate change. Human activities, such as excessive pumping and pollution, can compromise the integrity of groundwater reservoirs. Understanding the global distribution of groundwater is essential for implementing sustainable management practices, addressing challenges related to over-extraction, contamination, and climate change impacts on groundwater resources [1] [2].

Ecosystem Services

Ecosystem services are the benefits derived from natural ecosystems, which contribute to human well-being through water purification, nutrient cycling, soil fertility, and agricultural productivity. They play a crucial role in regulating climate patterns, supporting agriculture, and providing habitats for diverse species. Ecosystems also offer cultural and aesthetic value, providing recreational opportunities and a sense of connection to nature. Recognizing the full spectrum of ecosystem services is essential for sustainable resource management and conservation efforts, emphasizing the interdependence of human societies and the natural world. Understanding and appreciating these services is crucial for sustainable resource management and conservation efforts [3] [4].

Groundwater and Biodiversity

Groundwater availability significantly influences biodiversity across ecosystems, contributing to habitat provision and hydrological connectivity. It sustains various habitats for various species, supporting flora and fauna. Groundwater also acts as a buffering mechanism during drought or low precipitation,



creating refuges for aquatic organisms. This interconnected relationship is crucial for ecosystem health and sustainability, emphasizing the importance of understanding and managing these interconnected systems [5].

Groundwater-Supported Habitats

Wetlands, marshes, swamps, and bogs rely on groundwater for their existence, providing a consistent water source that keeps them saturated even during dry periods. These ecosystems are biodiversity hotspots, hosting a diverse array of plant and animal species. Groundwater-fed springs and riparian zones are vital for maintaining soil moisture and sustaining vegetation, supporting diverse species. Understanding the interconnectedness between groundwater availability and biodiversity is crucial for conservation and management strategies. Human activities, such as excessive groundwater extraction or pollution, can disrupt these delicate ecosystems, emphasizing the need for sustainable groundwater practices. Groundwater also plays a crucial role in maintaining essential hydrological processes, acting as a reservoir for water and acting as a natural buffer against short-term fluctuations in precipitation. This buffering capacity promotes ecological resilience and ensures the continued well-being of diverse species dependent on these groundwater-influenced environments [6]. Base flow, the steady water flow in rivers and streams, is influenced by groundwater discharge. Aquifer discharge sustains base flow, maintaining aquatic ecosystem health and providing a reliable source for downstream users. Groundwater seepage into river channels maintains stable water levels, preventing extreme fluctuations and supporting aquatic habitat integrity. Scientific literature emphasizes groundwater discharge's role in stabilizing river channels and ensuring organism survival. Groundwater discharge regulates river water temperature, affecting aquatic life's well-being and survival. It enters rivers at cooler temperatures than surface water, supporting aquatic ecosystems and promoting overall health and sustainability in riverine environments, especially during warmer seasons [7]. Groundwater plays a crucial role in sustaining stream ecosystems, ensuring continuous flow and preventing desiccation of water bodies. It maintains ecological integrity, providing habitats and support for aquatic organisms. Groundwater-fed pools and refugia serve as vital havens for aquatic species during dry spells, providing stable environments and preventing population declines. Scientific studies highlight the importance of groundwater in preventing ecological declines. Groundwater plays a crucial role in maintaining biodiversity and ecosystem functionality by sustaining connections between river systems and preventing habitat fragmentation during dry periods. It supports species movement and supports stream ecosystems during adverse conditions. Proper management of groundwater resources is essential for the continued functioning of hydrological processes and stream ecosystem preservation [8].

Water Quality and Groundwater

Groundwater quality significantly impacts ecosystem health, affecting plant life, algae, and aquatic organisms. Its chemical composition, pH levels, and temperature affect the growth and

well-being of aquatic life. Groundwater also serves as a natural guardian of surface water bodies through filtration processes, trapping and removing impurities and pollutants. It plays a crucial role in nutrient cycling, reducing nutrient loads and preventing imbalances. Groundwater discharge into rivers and lakes helps dilution of pollutants, fostering healthier conditions for aquatic life. Human activities, such as industrial discharge, agricultural runoff, and improper waste disposal, pose significant threats to groundwater quality, necessitating a nuanced understanding of these influences for effective strategies to safeguard groundwater quality [9] [10] [11].

CASE STUDIES: GROUNDWATER-DEPENDENT ECOSYSTEMS

1. Edwards Aquifer Recharge Zone - Texas, USA

The Edwards Aquifer in Texas is a vital freshwater source that supports diverse ecosystems, including the Balcones Canyonlands Preserve and cave ecosystems. However, anthropogenic influences, such as urbanization and increased water demand, threaten the natural recharge processes. Over-extraction disrupts the balance between groundwater availability and flora and fauna, threatening rare and endangered species. To preserve the Edwards Aquifer and its ecosystems, a comprehensive approach balancing human needs with natural recharge processes is needed [12] [13] [14].

2. Swan Coastal Plain - Western Australia

The Swan Coastal Plain in Western Australia is heavily reliant on groundwater, which sustains its diverse wetland ecosystems. However, urban development and agricultural extraction have led to declining groundwater levels, threatening the balance of these ecosystems. This is particularly concerning for Yanchep National Park, which relies on groundwater-supported wetlands for bird species. Sustainable groundwater management practices are crucial to mitigate this decline and preserve the ecological balance of the Swan Coastal Plain's wetland ecosystems [15] [16].

3. Everglades - Florida, USA

The Everglades ecosystem in Florida relies on groundwater for water regulation and supporting plant and animal life. However, anthropogenic influences like drainage and flood control projects, along with increased agricultural and urban water demands, have disrupted the natural water flow, causing changes in vegetation and species. To restore the balance and protect the ecosystem, ongoing restoration efforts aim to restore natural water flows and mitigate the adverse effects of human-induced changes [17] [18].

4. Mekong Delta - Southeast Asia

The Mekong Delta's vitality is largely dependent on groundwater, which shapes hydrological patterns and supports rice cultivation and aquatic species habitats. However, anthropogenic activities like agricultural extraction and dam construction have altered groundwater dynamics, impacting seasonal flooding patterns and resource availability. This has a profound impact on local communities, affecting their livelihoods and disrupting the delta's



ecosystem balance. A holistic approach integrating scientific insights into sustainable groundwater management practices is needed to mitigate the adverse effects of these activities. [19] [20].

These case studies highlight the diverse ecosystems worldwide that heavily depend on groundwater and the complex interplay of natural and anthropogenic factors influencing their health and sustainability. Sustainable groundwater management practices are essential to balance human needs with the preservation of these critical ecosystems.

Climate Change Impact on Groundwater Availability

Climate change is anticipated to instigate alterations in precipitation patterns worldwide, creating a dichotomy with increased rainfall in some regions and prolonged droughts in others. The repercussions of these changes reverberate significantly in the realm of groundwater availability. In regions experiencing heightened precipitation, groundwater recharge rates may escalate as increased water infiltrates into the ground. This augmentation could lead to elevations in groundwater levels, thereby influencing aquifer dynamics and potentially impacting the health of ecosystems reliant on groundwater resources. Conversely, arid and semi-arid regions may confront diminished groundwater recharge due to reduced precipitation, resulting in a decline in groundwater levels and limiting this crucial resource's availability for ecosystems [21].

Climate change's rising temperatures complicate groundwater availability by increasing evaporation and transpiration, potentially reducing recharge rates and disrupting snowmelt timing, affecting freshwater availability. Understanding these intricate linkages is crucial for developing effective strategies to mitigate these impacts and sustaining ecosystems dependent on groundwater, thereby enhancing adaptive management approaches [22] [23] [24].

Climate Change Impact on Ecosystems Dependent on Groundwater

Climate change impacts groundwater availability, causing shifts in vegetation distribution and habitat loss for species adapted to specific hydrological conditions. This affects riparian ecosystems, wetlands, and other groundwater-dependent habitats. Variations in groundwater availability can also influence invasive species dynamics, leading to structural and biodiversity alterations. Groundwater, a crucial sustainer of aquatic ecosystems, faces significant impacts from climate change, including temperature changes, precipitation patterns, and temperature disruptions. Reduced groundwater availability during droughts can induce stress on ecosystems, leading to declines in vegetation health and potential loss of biodiversity. Sea level rise can exacerbate saltwater intrusion into coastal aquifers, posing challenges for agriculture and human communities. Understanding these relationships is crucial for developing effective adaptation and mitigation strategies [25].

Anthropogenic Factors Leading to Groundwater Depletion

Groundwater depletion is primarily driven by agricultural activities, particularly irrigation, which disrupts the balance between recharge and extraction. Rapid urbanization and industrial expansion increase water demands, leading to increased groundwater extraction. Deforestation and land use changes also impact groundwater recharge, necessitating sustainable land management practices. Mining operations often involve groundwater extraction, leading to localized depletion. Improper waste disposal practices can cause contamination and over-extraction, requiring groundwater extraction for remediation. Climate change-induced stresses, such as droughts and reduced snowpack, also impact groundwater recharge rates, necessitating climate adaptation strategies and sustainable groundwater management [26] [27] [28].

Consequences for Ecosystems when Groundwater Levels Drop

Groundwater depletion is a major threat to wetland ecosystems, causing habitat drying and habitat loss for plant and animal species. Riparian zones, crucial for various species, are disrupted by declining groundwater levels, leading to altered streamflow and increased vulnerability to invasive species. Over-extraction of groundwater can cause saltwater intrusion, contaminating freshwater aquifers and negatively affecting coastal ecosystems. Aquatic ecosystems are also affected by groundwater depletion, reducing spring flows, leading to increased water temperatures and altered sediment transport. Groundwater-dependent wildlife may face challenges and displacement, leading to conflicts with human communities. Groundwater depletion also increases wildfire risk, necessitating sustainable water management practices and wildfire prevention strategies. Addressing anthropogenic impacts on groundwater depletion requires sustainable practices, stricter regulations, and community involvement [29] [30].

Strategies for Sustainable Management of Groundwater Resources

Groundwater monitoring systems are essential for tracking water levels, quality, and extraction rates, providing insights into groundwater dynamics and addressing challenges related to depletion and contamination [31][32]. Precision irrigation techniques in agriculture optimize water use and minimize excessive groundwater extraction, while artificial recharge projects enhance groundwater replenishment during surplus water availability [33]. Land use policies that consider groundwater recharge and preservation are crucial, with zoning regulations addressing critical recharge areas and ecosystems dependent on groundwater. Industries should adopt water recycling and reuse practices to minimize reliance on fresh groundwater and prevent contamination. Educational campaigns raise community awareness about groundwater conservation through exhibitions and IEC tools [34] [35]. Green infrastructure, such as permeable pavements, green roofs, and vegetative buffers, enhances natural groundwater recharge and reduces stormwater runoff. Integrating climate change considerations into groundwater management plans is essential for developing



adaptive strategies and ensuring groundwater management remains effective in the face of evolving climatic conditions [36].

Importance of Conservation Efforts and Policy in Preserving Groundwater-Dependent Ecosystems

Achieving a balance between human water needs and ecosystem preservation is crucial for sustaining biodiversity and maintaining aquatic and terrestrial ecosystems [37]. Conservation efforts and robust policies are essential for this, emphasizing the interconnectedness between groundwater management and ecosystem health. Sustainable groundwater withdrawal limits are crucial for safeguarding ecosystems, while setback regulations protect riparian zones and wetlands from human encroachment [38]. Mitigating saltwater intrusion in coastal areas requires comprehensive policies, including regulatory measures, sustainable agriculture, and enhanced coastal aquifer management. Financial incentives for sustainable groundwater practices promote water-efficient technologies and conservation. Equitable groundwater allocation frameworks consider both human needs and ecosystem requirements, and international cooperation and agreements are essential for transboundary collaboration[39]. Stringent regulations for groundwater extraction and pollution, along with effective enforcement mechanisms, are essential for protecting ecosystems. A scientifically informed and holistic approach to groundwater management is essential for preserving groundwater-dependent ecosystems for current and future generations [40].

Future Challenges

Climate change, population growth, urbanization, groundwater pollution, land use changes, and the globalization of water trade pose complex challenges to groundwater resources and ecosystems. Accurate predictions and adaptive strategies are crucial for addressing these uncertainties. Scientific research is needed to refine predictions and inform adaptive management strategies [41]. The rapid growth of the global population and urbanization also contribute to increased water demand, posing threats to water quality and ecosystem health [42]. Addressing pollution sources and implementing effective remediation measures is essential. Balancing development needs with sustainable land use practices is crucial. The globalization of water-intensive commodities and virtual water trade also introduces indirect impacts on distant groundwater resources, necessitating international cooperation and policies [43].

Future Opportunities

Advances in technology, such as remote sensing, GIS, modeling, and data analytics, are crucial for understanding groundwater systems and promoting sustainable groundwater management [44]. Nature-based solutions, such as green infrastructure and ecosystem restoration, improve water quality and climate resilience. Empowering local communities through education and engagement fosters ownership and responsibility for groundwater resources. Developing innovative policies that integrate groundwater management with environmental, economic, and social goals is essential for sustainable resource use.

Strengthening international collaboration on transboundary groundwater resources can enhance sustainable management practices. A scientifically informed approach that integrates these opportunities can contribute to effective strategies for preserving groundwater resources and ensuring their sustainability for future generations [45].

Areas for Further Research

Integrating hydrological models is a crucial research area that can improve our understanding of the complex interactions between surface water and groundwater, enhancing our comprehension of ecosystem dependencies and providing valuable tools for sustainable water management. Further investigation into groundwater-surface water interactions, ecosystem resilience, social-ecological systems, and groundwater recharge enhancement is also essential. These areas provide insights into the complexities of these relationships, their implications for ecosystem health, and the adaptive capacity of ecosystems to groundwater variations. Innovative techniques for enhancing groundwater recharge, such as managed aquifer recharge, artificial recharge, and natural infrastructure approaches, are also crucial for sustainable resource management [46].

Policy Development Priorities

Ecosystem-centric policies are essential for effective groundwater management, ensuring biodiversity preservation and long-term sustainability [47]. Adaptive governance frameworks are crucial for responding to changing hydrological conditions and emerging challenges. Strengthening regulations and enforcement mechanisms to prevent groundwater pollution is essential. Incentives for sustainable practices, such as tax breaks or subsidies, can drive positive change. Facilitating international cooperation for sustainable management of shared groundwater resources is crucial [48]. These policies promote international collaboration and sustainable use of transboundary aquifers. Scientific research in these areas informs policy development, contributing to the preservation of groundwater-dependent ecosystems for current and future generations.

CONCLUSIONS

Groundwater plays a crucial role in supporting ecosystems and is essential for their health and resilience. It contributes to habitat provision, water purification, and nutrient cycling, and is crucial for maintaining biodiversity and hydrological processes. However, human activities like over-extraction and industrial activities pose threats to groundwater resources [49]. Sustainable groundwater management strategies include monitoring, water-efficient agricultural practices, and nature-based solutions. Future challenges include climate change uncertainties, population growth, and globalization of water trade. Opportunities lie in technological innovations, nature-based solutions, and community engagement. Policy priorities include ecosystem-centric approaches, adaptive governance frameworks, and global cooperation agreements. A paradigm shift towards sustainable



management practices is necessary to balance human needs with the preservation of groundwater [50].

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EXPLORING THE PSYCHO-SOCIAL DYNAMICS: EXAMINING THE EFFECT OF ASSERTIVENESS TECHNIQUE ON LOW ACADEMIC SELF-CONCEPT AMONG SECONDARY SCHOOL STUDENTS

Obianuju Blessing Mokwelu¹, Anulika Valentina Etele², Uju Christiana Nwanna³,
Onyeisi Lucky Ogben⁴

¹Lecturer, Department of Guidance and Counselling, Nnamdi Azikiwe University, Akwa, Anambra State, Nigeria.

²Lecturer, Department of Guidance and Counselling, Nnamdi Azikiwe University, Akwa, Anambra State, Nigeria.

³Lecturer, Department of Guidance and Counselling, Nnamdi Azikiwe University, Akwa, Anambra State, Nigeria.

⁴Lecturer, Department of Guidance and Counselling, Nnamdi Azikiwe University, Akwa, Anambra State, Nigeria.

Article DOI: <https://doi.org/10.36713/epra16116>

DOI No: 10.36713/epra16116

ABSTRACT

This study explored the psycho-social dynamics by examining the effect of assertiveness technique on low academic self-concept among secondary school students in the Onitsha education zone. Two research questions guided the study, and two null hypotheses were tested at a 0.05 level of significance. The study design was quasi-experimental, non-randomised pre-test and post-test, control group research. The population of the study was composed of 988 senior secondary school students in the Onitsha education zone, and a sample of 70 students was selected through purposive sampling. The data was collected using the Academic Self-Concept Survey (ASS) questionnaire, and the internal consistency reliability coefficient of the instrument was 0.84. The questionnaires were administered through direct delivery. Mean scores were used to answer the research questions, and the null hypotheses were tested using Analysis of Co-variance (ANCOVA). The instrument norm of 72.50 was used to make decisions when answering the research questions. The findings of the study showed that assertiveness training was effective in improving the low academic self-concepts of secondary school students. Furthermore, it was revealed that the assertiveness training technique was more effective in improving the academic self-concepts of female secondary school students. Based on the findings and implications of the study, it was suggested that counsellors and therapists should use modelling and assertiveness training techniques in counselling sessions to enhance the academic self-concepts of secondary school students.

KEYWORDS: *Psycho-social dynamics, assertiveness, technique, academic self-concept*

1. INTRODUCTION

The educational landscape is not only shaped by cognitive abilities and academic achievements but is profoundly influenced by students' perceptions of their own academic abilities and worth. Academic self-concept, encompassing students' beliefs about their academic competence and value, plays a crucial role in shaping their educational journey. Within the realm of psychological interventions, assertiveness techniques emerge as a valuable tool, offering a unique avenue to influence these self-perceptions. The assertiveness technique, rooted in the principles of effective communication and self-expression, provides a promising avenue for enhancing students' assertiveness and self-concept. By fostering a healthy balance between expressing one's thoughts and respecting the perspectives of others, assertiveness training can potentially reshape the narrative surrounding academic self-concept, promoting a positive and empowering environment for students.

In the realm of education, self-concept serves as a foundational element for comprehending human behaviour and the learning process. The contemporary educational landscape places a premium on the enhancement of children's self-concepts,

recognizing it as a crucial objective for holistic development. Educational and social policies globally underscore the significance of fostering positive self-concepts, particularly in the academic domain.

Recent scholarship, exemplified by the work of Marsh and Craven (1997), illuminates the profound impact of positive academic self-concepts on various facets of academic life. From influencing academic behaviour to shaping choices, aspirations, and eventual achievements, the nexus between self-concept and academic outcomes is unmistakable. This correlation becomes even more pertinent in the context of secondary school students who navigate a myriad of challenges, stressors, and opportunities during a crucial phase of their academic journey.

For secondary school students, grappling with a low perception of their academic abilities can have far-reaching consequences. Beyond academic performance, low self-concept may impede the development of meaningful relationships, dampen feelings of happiness, induce anxiety, and curtail personal aspirations and achievements. Hattie's extensive meta-analysis in 2012, encompassing over 800 meta-analyses from 50,000 research



articles, underscored the pivotal role of self-concept as one of the 150 influences on student academic achievement.

In the perspective of Dramanu and Balarabe (2013), self-concept evolves through the amalgamation of environmental experiences and individual assessments of those experiences. The formative educational years represent a critical period for nurturing a positive self-concept in children. Consequently, for secondary school students, the awareness of their academic capabilities plays a pivotal role in their adaptation and overall success in the educational milieu. As highlighted by Liu and Wang (2008), academic self-concept, a subset of general self-concept, encompasses students' perceptions of their academic abilities shaped by interactions with peers, teachers, and parents.

Academic self-concept, in essence, reflects a learner's perception of their academic competence, commitment, involvement, and interest in schoolwork, as delineated by Hardy (2013). These perceptions are subject to environmental influences and the reinforcement of significant others, shaping the students' attitudes and actions. The reciprocal relationship between individual actions and self-perceptions underscores the dynamic nature of academic self-concept. In the context of this study, academic self-concept pertains to how secondary school students perceive their academic abilities, involvement, and interest in their schoolwork.

Recognizing its pivotal role, academic self-concept holds substantial importance for the personal adjustment of secondary school students and significantly influences various educational outcomes. Liem, McInerney, and Yeung (2015) assert that individuals are more likely to achieve greater success when they possess a strong sense of competence, high self-confidence, and positive self-perceptions. Consequently, students aspiring for academic excellence are anticipated to harbour elevated academic self-concepts.

La Shawn's (2011) findings offer valuable insights into strategies for enhancing academic self-concept. Enhancement techniques are typically devised based on two predominant approaches. The first, a self-enhancement orientation, directly targets self-concept through methods like praise and performance feedback. The second, as highlighted by Clark (2016), adopts a skill development orientation, indirectly influencing academic self-concept by targeting constructs related to self-concept, such as academic achievement. These diverse approaches provide a comprehensive framework for understanding and improving academic self-concept among secondary school students.

Assertiveness for instance is an important behaviour modification technique that could be used to improve the self-concept of students in schools. The technique of assertiveness training holds a longstanding position in the realm of behaviour therapy. Assertiveness, a psychological concept, encapsulates three fundamental aspects of human expression—behaviour, cognition, and emotion. As noted by Makinde and Akinteye (2013), the behavioural dimension of assertiveness technique empowers individuals to openly communicate their emotions, assert their objectives and goals in various situations, and experience a sense of achievement and success in interpersonal

relationships. On the affective front, assertive individuals can articulate and manage both positive and negative emotions without succumbing to anxiety and unwarranted anger. Research, including that conducted by Animasahun and Oladeni (2012), has demonstrated that assertiveness training contributes to the enhancement of assertive behaviour in students. Additionally, the study by Anyamene, Nwokolo, and Ezeani (2016) investigating the impact of assertive training on the low self-esteem of secondary school students indicated that the successful application of assertiveness techniques could positively influence students' academic self-concept.

Furthermore, Ayodele and Sotonade's (2014) research indicated that male participants tend to derive greater benefits from self-management and assertiveness training programs. Conversely, Anyamene, Nwokolo, and Ezeani's (2016) study on the effect of assertive training on low self-esteem among secondary school students found no significant gender difference, suggesting that assertive training is effective for both male and female students. A similar observation was made by Agbakwuru and Ugwueze (2014) in their investigation of the effect of assertive training on the improvement of resilience in early adolescents, where both male and female participants were equally affected by the assertiveness training. Considering these research findings, it is evident that gender can influence responses to various treatment approaches, potentially impacting the outcomes of treatments such as assertiveness training, which plays a crucial role in students' social adjustment within school environments. Amidst this backdrop, this study aims to explore the psycho-social dynamics inherent in the academic lives of secondary school students. Specifically, the research endeavours to unravel the impact of assertiveness techniques on low academic self-concept.

Statement of the Problem

The study aims to explore the psycho-social dynamics involved in the impact of assertiveness techniques on the academic self-concept of secondary school students. While there is existing literature on interventions for enhancing academic self-concept, there is a noticeable gap in understanding the specific psycho-social dynamics associated with assertiveness training and its effectiveness in addressing low academic self-concept among secondary school students. This gap highlights the need for a focused investigation into the degree of interactions and psychological processes involved in assertiveness training to address the unique challenges associated with low academic self-concept in this particular demographic. The study seeks to bridge this gap by providing valuable insights into the effectiveness of assertiveness techniques and their contribution to enhancing academic self-concept among secondary school students.

2. OBJECTIVES OF THE STUDY

The primary objective of this research is to examine the effect of assertiveness techniques on improving the low academic self-concept of senior secondary school students in Onitsha education zone. Specifically, the study aims to:

1. The effect of assertiveness techniques on improving the low academic self-concept of secondary school students, in comparison with those who underwent



conventional counselling, as measured by their pre-test and post-test scores.

2. Differences in the effect of assertiveness techniques on improving low academic self-concept among male and female secondary school students, assessed through their gained mean scores.

Research Questions

The following research questions guided the study:

1. What is the effect of assertiveness techniques on improving the low academic self-concept of secondary school students, in comparison with those who underwent conventional counselling, as measured by their pre-test and post-test scores?
2. What is the difference in the effect of assertiveness techniques on improving low academic self-concept among male and female secondary school students, assessed through their gained mean scores?

Hypotheses

The following null hypotheses were formulated to guide the study and were tested at the 0.05 level of significance:

1. There is significant difference in the effect of assertiveness techniques on improving the low academic self-concept of secondary school students, in comparison with those who underwent conventional counselling, as measured by their pre-test and post-test scores.
2. The differences in the effect of assertiveness techniques on improving low academic self-concept among male and female secondary school students, assessed through their gained mean scores is not significant.

3. METHODOLOGY

This research adopts a quasi-experimental design, specifically a non-randomized pre-test, post-test, and control group approach. The study comprises two treatment conditions, namely the Experimental group and the Control group, focusing on students with low academic self-concept. In this design, participants are not randomly assigned to groups, and the study aims to assess the impact of different treatments on the academic self-concept of the participants. The research was carried out in the Onitsha Education Zone of Anambra State, situated in the South East Geo-Political Zone of Nigeria. This specific geographical area was chosen due to the observable prevalence of negative self-concepts among students, potentially impeding their learning capabilities. Recognizing the significance of these formative years, where negative experiences can have enduring consequences, the study aimed to investigate and address the challenges related to students' self-concept in this region. The focus on negative self-concepts aligns with the understanding that such experiences during crucial developmental stages may have long-term repercussions on a student's educational journey and life trajectory.

4. SAMPLING DESIGN

The study's sample consisted of 108 students carefully chosen from a larger population of 988 students. This population

specifically included students with low academic self-concept. The selection process involved assessing the extent of their low self-concept, determined by their pre-test scores obtained through the administration of a questionnaire. The pre-test scores played a crucial role in identifying and selecting participants based on the degree of their low academic self-concept, ensuring that the sample represented individuals facing challenges in this particular aspect.

The data collection for this study utilized the Academic Self-concept Survey (ASS), a psychometric survey instrument designed and validated to gauge students' self-concept concerning various aspects, including peer interaction, academics, thought processes, school, and home. The reliability of the instrument was assessed through Cronbach's alphas, revealing a commendable high reliability coefficient of 0.84. This indicates that the ASS reliably measures the intended constructs consistently, contributing to the robustness and validity of the study's findings.

5. EXPERIMENTAL PROCEDURE

The researcher secured approval from the schools' management by providing a consent letter. Subsequently, the experimental training sessions occurred at the two selected schools. Collaborating with the guidance counsellors, the researcher conducted an eight-week training program for both the treatment and control groups. The treatment sessions were conducted in the school's counselling centres, with specific days and times established and maintained throughout the intervention. Each training session, lasting 45 minutes, adhered to the scheduled counselling periods as outlined by the schools.

In the experimental groups, participants were trained in assertiveness technique, while the control group received conventional group counselling. This training regimen continued for eight weeks. Following the completion of the treatment period, the Academic Self-Concept Survey (ASS) was readministered to all participants in both the experimental and control groups. The resulting scores, constituting the post-test data, were then collated and subjected to statistical analysis along with the earlier collected pre-test scores. This comprehensive process aimed to assess the impact of the interventions on participants' academic self-concepts.

6. CONTROL OF EXTRANEIOUS VARIABLES

The researcher implemented measures to control potential extraneous variables, including participant mood, location, discrimination, method, and time of day. Failure to control these factors adequately could have introduced contamination to the study and potentially interfered with the accuracy of the findings.

7. STATISTICAL DESIGN

The scoring of the completed instruments was carried out in accordance with the guidelines outlined in the Academic Self-concept Survey (ASS) manual. The research question was addressed through statistical mean calculations, while the null hypotheses underwent testing via Analysis of Covariance (ANCOVA). A treatment technique for a group was deemed "effective" if its post-test mean score fell below the norm of



70.27; otherwise, it was considered "not effective." Regarding the null hypotheses, rejection occurred when the p-value was less than the 0.05 level of significance, while acceptance took place when the p-value exceeded the specified level of significance.

8. RESULTS

The data analysed are presented as follows:

Research Question 1

What is the effect of assertiveness techniques on improving the low academic self-concept of secondary school students, in comparison with those who underwent conventional counselling, as measured by their pre-test and post-test scores?

Table 1: Pre-test and Post-test Academic self-concept mean scores of students Treated with Assertiveness technique and those treated with conventional counselling (Norm= 72.50)

Source of variation	N	Pre-test Mean	Post-test Mean	Gained mean	Remark
Assertiveness	34	65.56	93.26	27.7	Effective
Control	30	63.23	70.47	7.24	

Table 1 reveals that the students with low academic self-concept, who were treated with Assertiveness technique, had pre-test mean score of 65.56 and post-test mean score of 93.26 with gained mean 27.7 in their Academic self-concept enhancement treatment, while those in the control group who received conventional counselling had pre-test mean score of 63.23 and post-test mean score of 70.47 with gained mean of 10.53. Therefore, with post-test mean score of 93.26 which is

above the norm of 72.50, Assertiveness technique is effective in enhancing Academic self-concepts of secondary school students.

Research Question 2

What is the difference in the effect of assertiveness techniques on improving low academic self-concept among male and female secondary school students, assessed?

Table 2: Pretest and Posttest low academic self-concepts mean scores of male and female students treated with assertiveness training technique

Source of Variation	N	Pretest Mean	Posttest Mean	Lost Mean	Remark
Male	13	66.77	93.54	26.77	
Female	21	64.81	93.10	28.29	More Effective

Table 2 reveals that the male students treated with assertiveness training technique had pretest mean score of 66.77 and posttest mean score of 93.54 with gained mean 26.77 in their low academic self-concepts, while the female students treated with assertiveness training technique had pretest mean score of 64.81 and posttest mean score of 93.10 with gained mean 28.29. With gained mean score of 28.29 for females which is greater than gained mean score of 26.77 for males, assertiveness training technique is more effective in enhancing female secondary school students' low academic self-concepts.

Testing the Null Hypotheses

Null Hypothesis 1

There is significant difference in the effect of assertiveness techniques on improving the low academic self-concept of secondary school students, in comparison with those who underwent conventional counselling, as measured by their pre-test and post-test scores.

Table 3: ANCOVA on the effect of modelling technique on low academic self-concept of secondary school students compared with those treated with conventional counselling

Source of variation	SS	df	MS	Cal. F	Pvalue	P ≤ 0.05
Corrected Model	3068.405	2	1534.203			
Intercept	2717.255	1	2717.255			
Pretest	46.198	1	46.198			
Treatment methods	2733.541	1	2733.541	60.97	0.000	S
Error	2645.143	59	44.833			
Total	379808.000	62				
Corrected Total	5713.548	61				

Table 3 indicates that at 0.05 level of significance, 1df numerator and 61df denominator, the calculated F is 60.97 with Pvalue of 0.000 which is less than 0.05. Therefore, the first null hypothesis is rejected. So, the effect of modeling technique on the low academic self-concept of secondary school students is significant.

Null Hypothesis 2

The differences in the effect of assertiveness techniques on improving low academic self-concept among male and female secondary school students, assessed through their gained mean scores is not significant.



Table 10: ANCOVA on the effective of assertiveness training technique in enhancing academic self-concept of male and female secondary school students

Source of Variation	Sum of Squares	df	Mean Square	Cal. F	Pvalue	Decision
Corrected Model	88.105	2	44.052			
Intercept	573.905	1	573.905			
PRETEST	.256	1	.256			
GENDER	84.912	1	84.912	1.328	.258	NS
Error	1982.513	31	63.952			
Total	297813.000	34				
Corrected Total	2070.618	33				

Table 10 shows that at 0.05 level of significance, 1df numerator and 33df denominator, the calculated F is 1.328 with Pvalue of 0.258 which is greater than the stipulated 0.05 level of significance. Therefore, the null hypothesis is accepted. The differences in the effects of assertiveness training technique in enhancing academic self-concept of male and female secondary school students when compared using their pre-test and post-test mean scores is not significant.

9. DISCUSSION

Findings of this study were discussed as follows:

The effect of assertiveness technique in enhancing Academic self-concepts of secondary school students

The findings of the study revealed the effectiveness of assertiveness techniques in elevating the academic self-concept of secondary school students. Those exposed to assertiveness therapy demonstrated an enhancement in their academic self-concept, as evidenced by a post-test mean score exceeding the norm of the measuring instrument. Additionally, a significant difference was observed when comparing the impact of assertiveness technique with conventional counselling on secondary school students' academic self-concept. This aligns with the conclusions drawn by Makinde and Akinteye (2013), who found assertiveness training to be efficacious in boosting adolescents' self-esteem. Similar support comes from related studies by Agbakwuru and Ugwueze (2014), Anyamene, Nwokolo, and Ezeani (2016), and Okeiye, Okereke, and Nwoga (2015), highlighting the positive effects of assertiveness training on self-esteem and resilience in respondents.

The success of assertiveness training in enhancing academic self-concept may stem from several factors. First, assertiveness is integral to self-concept; as assertiveness increases, so does self-concept. Furthermore, assertiveness training is grounded in the recognition of one's inherent worth and the accompanying rights, motivating participants to assert themselves confidently in academics. Another contributing factor may be the improvement in communication skills through assertive behaviours. Successful communication likely leads to positive evaluations from others, positively influencing the participants' self-concept. This aligns with Burnett's (1999) observations regarding a cycle of non-assertive behaviour hindering academic self-concept, with assertiveness breaking this cycle by garnering positive responses and improving self-evaluation.

The positive impact of assertiveness training may also be attributed to the notion that academic self-concept is shaped by a student's self-perception developed through academic endeavours and interactions. If students struggle with low academic self-concept, assertiveness becomes crucial for successful coping. The study's assertiveness therapy aimed to alter students' self-perception, fostering increased assertiveness, adequate expression of emotions and thoughts, and a further boost in self-confidence. As students apply assertiveness skills across various aspects of their lives, including social, academic, and personal spheres, they cultivate a stronger belief in their potential for achieving success.

The effect of assertiveness technique in enhancing Academic self-concepts of male and female secondary school students

The findings of the study highlight the effectiveness of assertiveness training in improving the low academic self-concepts of female secondary school students. Interestingly, there was no significant difference in the effectiveness of assertiveness training between male and female students. This aligns with the conclusions drawn by Anyamene, Nwokolo, and Ezeani (2016) and Makinde and Akinteye (2013), whose related studies found no significant gender-based differences in the impact of assertiveness training on students' low self-esteem. Okeiye, Okereke and Nwoga (2015) also supported these findings, reporting no statistically significant differences in the effects of assertiveness therapy on male and female students participating in assertiveness training programs.

One possible explanation for these findings is the early development of assertiveness skills during children's educational programs. In these early stages, students are encouraged to express opinions and assert their personal rights, fostering empowerment and autonomy. Students practice assertiveness skills through demonstrations, role-playing, and classroom experiences, receiving support, guidance, and feedback from teachers, counsellors, and other significant figures in the school environment.

Additionally, the nature of the experimental training provided to participants might contribute to the lack of gender-specific effects. The training focused on building assertive behaviour without a gender dimension, emphasizing the importance of feeling positive about oneself in relation to academic pursuits. The study suggests that the similarities observed in the



assertiveness development between female and male learners indicate a shared need for self-directed behaviours in the quest to improve academic self-concept. Learning to be assertive in an academic context involves managing interactions, situations, and activities in school, serving as an essential skill for students aspiring to achieve academic success regardless of gender.

10. CONCLUSIONS

Based on the findings of this study, the following conclusions are made:

This study presented compelling evidence suggesting that the academic self-concept of secondary school students can experience improvement through the application of assertiveness techniques. However, despite these findings, the study concludes that assertiveness techniques do not yield a significant impact on the academic self-concept of both male and female secondary school students. While the study provides evidence of the potential positive impact of assertiveness techniques on the academic self-concept of secondary school students, there is lack of a significant overall effect for both genders. Further research and exploration of specific factors influencing the effectiveness of assertiveness techniques in different contexts may shed light on the complex relationship between assertiveness training and academic self-concept.

11. RECOMMENDATIONS

Based on the findings of this study, the following recommendations are made:

1. Considering the observed improvement in the academic self-concept of secondary school students through assertiveness techniques, it is recommended guidance counsellors working in secondary schools should utilise the technique and explore a more diverse range of assertiveness training methods.
2. Despite the overall non-significant impact on both male and female students, it is recommended to explore potential gender-specific nuances in response to assertiveness techniques. This could involve adapting assertiveness training content or delivery methods to better address the unique challenges and preferences of each gender. A gender-sensitive approach might reveal distinctions in how male and female students internalize assertiveness skills, leading to more targeted and effective interventions.

Acknowledgements

The authors acknowledge that there is no involvement of funding body or organization in the whole work.

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DEVELOPMENT OF ALOE VERA HAND SANITIZER

Lewelyn Christine H. Palmero

Laguna State Polytechnic University Sta. Cruz,

ABSTRACT

The aim of the study was to develop a hand sanitizer that offers secure and efficient substitutes. Aloe Vera-based hand sanitizer that has no other potentially dangerous components. Aloe Vera is widely known for its ability to naturally hydrate skin, and its gel-like consistency makes it ideal for use in hand sanitizers. However, many people are unaware that Aloe Vera naturally protects against viral and bacterial illnesses because it contains polyphenols that stop bacterial growth. Aloe Barbadensis (Aloe Vera) Leaf Juice, which is made organically, serves to fight bacteria alongside alcohol without interfering with your hormonal balance. The purpose of the study is to 1.) To determine the properties and its compounds of Aloe Vera as potential Hand sanitizer, 2.) To determine the Quantity of different ingredients in preparation of Aloe Vera Hand Sanitizer, 3.) To test the Microbial Counts of Aloe Vera Hand Sanitizer with Different Essential Oils. The Study used organic Aloe Vera gel was tried as the major components of hand sanitizer, with an additional proportion of grain alcohol, distilled water and essential oils which give varied scent and effect to the hand sanitizer. Microbial test was done by the Department of Science and Technology (DOST) (Regional Standards and Testing Laboratory) to determine the number of microbes present in the hand sanitizer with different essential oils. In light of the findings, Aloe vera hand sanitizer with rose essential oil showed a less number of microbes, which was found similar with the commercial hand sanitizer.

KEYWORDS: Hand Sanitizer, Aloe Vera, Essential Oils, Microbial test, Disinfectant

INTRODUCTION

Due to the COVID-19 outbreak, alcohol-based hand sanitizers (ABHS) have proliferated as a frequent alternative to traditional handwashing in healthcare and community settings, driving up demand for alcohol. There are numerous hand sanitizers available in various varieties. The kinds of hand sanitizers that efficiently combat viruses must be taken into account. The majority of ABHS suggested by the WHO are made up of ethanol, isopropyl alcohols, or hydrogen peroxides in a variety of combinations, with the percentage of ethanol or isopropyl alcohol often falling between 60 and 95 percent. For the majority of ABHS, this concentration range can be regarded as the active bactericidal concentration range. The production of ABHS, which drastically cut the world's supply of alcohol, has boosted the demand for alcohol.

In this study, the effectiveness natural substances such as aloe vera, vitamin E, glycerin, and various essential oils (EOs) was assessed. Additionally, these chemicals are generally accessible due to their market availability. Due to its inherent moisturizing and germ-retarding properties as well as its capacity to suppress some bacterial strains, aloe vera gel was used as the vehicle for hand sanitizer. Due to their relative capacities to delay rancidity (i.e., the oxidation or hydrolysis of fats and oils) and moisturize the skin, vitamin E and glycerin were utilized. The EOs, which have a variety of antibacterial properties.

Aloe vera is used as a disinfectant since it is a natural product that is easily available, inexpensive, has few to no adverse effects, and most importantly, is completely biodegradable and does not harm the environment. Aloe vera's soothing properties are crucial in hand sanitizer. When combined with aloe vera, alcohol, which can be abrasive on its own, is less likely to irritate your skin. Additionally, it makes your alcohol last longer, allowing you to utilize the same chemicals to get rid of more germs. A medical plant called aloe vera has long been used to strengthen skin integrity. The anti-inflammatory, anti-bacterial, anti-viral, antiseptic, and wound-healing effects of aloe vera are well documented.

Aloe vera has 75 known compounds, including 20 minerals, 20 amino acids, vitamins, and water. The Egyptian queens Nefertiti and Cleopatra used it as part of their regular beauty regimen. In vitro studies and studies on living organisms have shown that Aloe vera can inhibit thromboxane (an inhibitor of wound healing), improve the wound healing process, and reduce inflammation. Magnesium lactate present in the gel can help reduce inflammation. Aloe vera inhibits IL-6 and IL-8, decreases leukocyte adhesion, raises IL-10 levels, and decreases TNF-levels, which all work together to prevent inflammation.


Strong antiviral, antifungal, and antibacterial activities are found in aloe vera. Compounds like p-coumaric acid, ascorbic acid, pyrocatechol, and cinnamic acid are present in aloe vera, which is known for its antibacterial properties.



Hand sanitizer formulations and preparations made from herbal plants have been shown to be efficient against infections. The results have also been compared and found to be effective with hand sanitizer formulations made from alcohol. As far as the environment is concerned, these herbal preparations have been deemed safe for human health (Kalaivani et al., 2018, Acharya et al., 2018, Yaun and Vasquez, 2017).

Since, personal hygiene and health precautions is very important, the use of a hand sanitizer is essential for cleaning hands and can prevent the spread of germs, infections and diseases.

METHODOLOGY

INPUT	PROCESS	OUTPUT
Ingredients: - Aloe vera gel - Grain alcohol - Distilled water - Essential Oils Lavender Peppermint Sampaguita Ylang ylang Rose	Procedure: -Extracting Aloe Vera Gel through: peeling Slicing Straining -Measuring and Mixing all ingredients -Dropping all the essential oils -Pouring into the spray Bottles -Labeling	 Essential Oils

This study utilizes the experimental design wherein the organic aloe vera gel was tried as the major components of hand sanitizer, with an additional proportion of grain alcohol, distilled water and essential oils which give varied scent and effect to the hand sanitizer.

Microbial test was done by the Department of Science and Technology (DOST) (Regional Standards and Testing Laboratory) to determine the number of microbes present in the hand sanitizer with different essential oils.

The *first step* was preparing the ingredients and the needed materials. As shown in table 1, the ingredients used were the organic aloe vera gel, grain alcohol, distilled water, and different prepared essential oils such as lavender, peppermint, sampaguita, ylang-ylang and rose.

The materials include *beaker* for mixing , *plastic canister* as a container for aloe vera gel, *plastic/wooden spoon* for stirring the mixture, medicine *dropper* used for the addition of essential oils , *knife* for peeling, cutting into smaller pieces the aloe vera, (before extracting the aloe vera gel, the leaves are peeled off to get the gel and cut into smaller pieces) then, the *strainer* is for straining the aloe vera gel, and *pump or squeeze bottle* serve as a container for aloe vera hand sanitizer.

Additionally, it can assist in eliminating a variety of viruses and disease-causing substances that may be on your hands, such as the coronavirus SARS-CoV-2. Even the best alcohol-based hand sanitizers, meanwhile, have limitations and can't completely get rid of all bacteria.

When there is no access to soap or water, hand sanitizer is a convenient on-the-go approach to help stop the spread of germs. You can stay safe and stop the spread of infections by using alcohol-based hand sanitizers.

The *second step* is measuring the ingredients needed. As shown in table 1, needed measurement is presented.

Step three, was the mixing of different ingredients. After measuring 1 oz. grain alcohol it was mixed with 2 oz. pure aloe vera gel in a small bowl.

Then, 1 oz. distilled water was added and stirred with a wooden/plastic spoon to combine.

Fourth step, was dropping 5 drops of essential oils (lavender, peppermint, sampaguita, ylang ylang, and rose). It was stirred well with the plastic/wooden spoon to combine.

Fifth step, was pouring of the mixture in a clean plastic pump or squeeze bottled. Labeling or indicating the name and the date it was made.

Given the Steps in Preparing Aloe Vera hand Sanitizer, the amount of microorganisms on your hands can be quickly reduced, according to the CDC Trusted Source, by using an alcohol-based hand sanitizer that satisfies the alcohol volume criterion.



RESULTS AND DISCUSSION

Table 1. Active Components with its Properties of Aloe Vera

Active Components of Aloe Vera	Review of Related Literature
1. Vitamins: It contains vitamins A (beta-carotene), C and E, B12, folic acid, and choline	<p>Numerous vitamins, including Vitamins A, C, E, B1, B2, B3 (niacin), B6, choline, folic acid, alpha-tocopherol, and beta-carotene, are found in Aloe Vera. A. One of the few plants that contain vitamin B12 is vera. Antioxidant vitamins like vitamins A, C, and E are crucial in the battle against harmful free radicals. Each of the three has a beneficial effect on the immune system, and vitamin C in particular promotes wound healing. It also produces collagen, which keeps the bones, skin, and joints healthy and firm. To keep your night vision normal, you must consume vitamin A. Blood clots, thrombosis, and atherosclerosis can all be avoided thanks to vitamin E. It also facilitates fertility and wound healing.</p>
2. Enzymes: It contains 8 enzymes: aliase, alkaline phosphatase, amylase, bradykinase, carboxypeptidase, catalase, cellulase, lipase, and peroxidase.	<p>There are a number of different enzymes found in aloe vera, including amylase, bradykinase, aliase, alkaline phosphatase, peroxidase, catalase, cellulose, lipase, and carboxypeptidase. When administered topically to the skin, these enzymes function by decreasing inflammation.</p> <p>According to an analysis of the basic peroxidase by Esteban et al., it can be discovered in the internal aqueous leaf parenchyma of the aloe vera plant as well as in the commercially available aloe gel. The possibility that the skin's surface peroxidase enzyme can remove H₂O₂ was discovered. This shows that the Aloe vera plant possesses pleasing antioxidant qualities, and it also provides support for the use of plant-based medicines to treat a variety of ailments.</p> <p>The aloe vera enzyme kinase is widely known for reducing pain. It has been demonstrated that when used topically, it can lessen inflammation and potentially hasten wound healing. Aloe vera enzymes enhance levels of hyaluronic acid in wounds that are healing and stimulate fibroblast activity and collagen formation in the skin.</p>
3. Minerals: Provides Calcium, chromium, copper, selenium, magnesium, manganese, potassium, sodium and Zinc.	<p>Ten of the important minerals for your skin are found in aloe vera, and not just for sunburned skin. Calcium, copper, magnesium, potassium, sodium, chromium, iron, manganese, phosphorus, and zinc are some of these minerals. They help you have skin that is more radiant. This makes aloe vera a fantastic addition to your skincare regimen.</p>
4. Sugars: It provides monosaccharides (glucose and fructose) and polysaccharides: (glucomannans/polymannose).	<p>Aloe can have a variety of polysaccharide types. The amount of each varies with the age of the plant. Aloe contains glucomannan, a soluble fiber fraction, and hemicellulose, a component that binds to fibroblast receptors in some plants' cell walls to promote their proliferation. As a result, it speeds up the healing of wounds. Lignins found in aloe also help its constituent parts to be absorbed through the skin. As a result, when aloe is applied locally or externally, more collagen is created.</p> <p>By retaining water in the skin, mucopolysaccharides moisturize it. The three main mucopolysaccharides found in aloe are heparin,</p>



<p>5. Anthraquinones: It provides 12 anthraquinones.</p> <p>6. Fatty acids: It provides 4 plant steroids; cholesterol, campesterol, β-sisosterol and lupeol.</p> <p>7. Hormones: Auxins and gibberellins.</p> <p>8. Others: It provides 20 of the 22 human required <i>amino acids</i> and 7 of the 8 essential amino acids. It also contains salicylic acid.</p>	<p>acemannan, and hyaluronic acid, however acemannan is the one that is present in the highest concentration. It has a lengthy carbon chain, largely made up of uronic acids and amino sugars. The antibacterial, antiviral, and antifungal effects of acemannan are all present. It is also one of the most potent plant-derived immunomodulators and is in charge of the organism's immune responses. The macrophage-activating substance acemannan causes germs to bind and be destroyed. It builds up in the cell membranes, creating a distinct protective barrier that strengthens the cell wall as a result. It thus prevents toxins from the gut from being absorbed into the circulatory system. It also helps the bacterial flora in the environment regenerate naturally.</p> <p>Anthraquinones have a positive impact on health for those suffering from viral and fungus diseases, as well as malaria. Experiments are often in the stage of evaluating the functional characteristics of anthraquinones in studies. Aloe's two primary anthraquinones are aloe-emodin and aloin. Primarily present in aloe juice, aloe-emodin is a chemical with the major alcohol group.</p> <p>These all work to reduce inflammation and contain lupeol also has analgesic and antibacterial effects.</p> <p>Aloe vera has six antibacterial agents, including lupeol, salicylic acid, urea nitrogen, and phenols, sulphur and cinnamonic acid. These chemicals have an inhibiting effect on fungus, viruses and bacteria.</p> <p>The auxins found in some plant extracts are likely connected to substances that resemble steroids. This would explain why gelatin-induced edema is treated with gibberellin because it has an anti-inflammatory impact.</p> <p>Gibberellins boost protein synthesis in contrast to steroids, which are antianabolic. As a result, they would usually help heal wounds.</p> <p>Salicylic acid, which has anti-inflammatory and antibacterial effects, is also present. Lignin, an inert chemical, increases the other compounds' ability to penetrate the skin when added to topical treatments. About 3% of the gel is made up of soap-like saponins, which have antibacterial and cleaning characteristics.</p>
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Table 2. List of Ingredients and their Quantity

Quantity	Unit	Ingredients
1	Ounce/ 20ml	Grain alcohol
2	Ounce/40ml	Pure organic aloe vera gel
1	Ounce/20ml	Distilled water
5	drops	essential oil

**Table 3. Microbial Test Result of the Aloe Vera Hand Sanitizer with Different Essential Oils**

Aloe Vera Hand Sanitizer	Aerobic Plate Count, cfu/ml	Interpretation
Lavender essential oil	30 cfu/ml	Many microbes
Peppermint essential oil	70 cfu/ml	Plenty microbes
Sampaguita essential oil	10* cfu/ml	Few microbes
Ylang –ylang essential oil	10* cfu/ml	Few microbes
Rose essential oil	<10* cfu/ml	Less microbes
Commercial Hand Sanitizer	<10* cfu/ml	Less microbes

Legend:

- 1 = <10* = less microbes
- 2 = 10* = few microbes
- 3 = 30 = many microbes
- 4 = 70 = plenty microbes

cfu/ml =colony forming unit/milliliter

As presented in table 2, aloe vera hand sanitizer with peppermint essential oil got 70 cfu/ml interpreted with “*plenty microbes*”, lavender essential oil got 30 cfu/ml interpreted with “*many microbes*”, sampaguita and ylang-ylang essential oils they obtained 10 cfu/ml interpreted with “*few microbes*”, and rose essential oil got <10 cfu/ml interpreted with “*less microbes*” which is the same with the commercial hand sanitizer.

A method for testing nonsterile pharmaceutical preparations for their microbial content is described. As far as possible, only solid culture media were used to obtain quantitative results. Aqueous and water-soluble products were tested with membrane-filter techniques. Nonfilterable products were first emulsified or suspended and the homogenate was used for examination. In both procedures, the total number of colonies is determined for aerobic bacteria and fungi. Tests for certain undesirable microbial groups were conducted with selected media. The method described is applicable for finished products, bulk products, raw materials, and active ingredients. Canan and Ceyhan,(2017)

CONCLUSIONS

Based on the findings of the study, the following conclusions were drawn:

1. Aloe vera has strong antiviral, antifungal, and antibacterial activities. Because aloe vera contains substances including p-coumaric acid, ascorbic acid, pyrocatechol, and cinnamic acid, it is known to have an antimicrobial effect.
2. Each ingredient has the following quantities, 1 ounce of grain alcohol, 2 ounce of pure organic aloe vera gel, 1 ounce of distilled water, and 5 drops each of essential oil.
3. Aloe vera hand sanitizer with rose essential oil showed a less number of microbes, which was found similar with the commercial hand sanitizer.

Recommendations

In view of the conclusions of the study, the following are offered:

1. Other processes in making hand sanitizer should be established to be able to produce quality projects.

2. It is also advised that the use of other essential oils such as eucalyptus, sandal wood, and lemon grass as alternatives to aloe vera hand sanitizer be investigated further.
3. Because rose essential oil had fewer microorganisms, it is proposed that it be prioritized for future evaluation.

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MENTAL HEALTH PROMOTION IN THE WORKPLACE: STRATEGIES FOR OCCUPATIONAL HEALTH NURSES

Ambily Joy

*Assistant Professor, Mental Health Nursing Department,
Holy Family College of Nursing, Muthalakkodam, Thodupuzha East, Kerala, India*

ABSTRACT

This review article explores the crucial role of occupational health nurses (OHNs) in promoting mental health in the workplace. With a growing recognition of the impact of work-related stressors on mental well-being, this paper discusses various strategies and interventions OHNs can employ to support mental health promotion. From proactive risk assessments to implementing stress management programs, OHNs play a pivotal role in creating psychologically safe work environments. This article synthesizes current literature and best practices, providing insights into the challenges and opportunities in mental health promotion within occupational health settings.

KEYWORDS: *Mental health promotion, workplace, occupational health nurses, stress management, psychosocial risk assessment, intervention strategies.*

INTRODUCTION

Mental health in the workplace is increasingly recognized as a critical component of overall well-being, with profound implications for both employees and organizations. Occupational health nurses (OHNs) occupy a unique position to address mental health concerns in the workplace due to their expertise in health promotion, prevention, and intervention. This review aims to examine the role of OHNs in mental health promotion within workplace settings, highlighting effective strategies and interventions.

In recent years, the discourse surrounding mental health in the workplace has gained significant traction, highlighting its pivotal role in overall employee well-being and organizational success. The workplace environment serves as a crucible where individuals spend a substantial portion of their waking hours, making it a potent determinant of mental health outcomes. From the pressures of meeting deadlines to navigating interpersonal dynamics, the modern workplace presents a myriad of stressors that can significantly impact employees' mental well-being.

Amidst this backdrop, occupational health nurses (OHNs) emerge as frontline advocates for mental health promotion within workplace settings. Their unique blend of clinical expertise, preventive care strategies, and occupational health knowledge positions them as integral members of the multidisciplinary team tasked with fostering a mentally healthy workforce. As the gatekeepers of employee health, OHNs possess a comprehensive understanding of the intricate interplay between work-related factors and mental health outcomes, enabling them to devise targeted interventions and support mechanisms.

The importance of addressing mental health in the workplace cannot be overstated. Beyond the moral imperative of safeguarding employees' well-being, there exists a compelling

business case for prioritizing mental health promotion initiatives. Research consistently demonstrates the link between employee mental health and organizational performance indicators such as productivity, absenteeism, turnover rates, and healthcare costs. By investing in mental health promotion, organizations stand to cultivate a more engaged, resilient, and high-performing workforce, thereby enhancing their competitive edge in an increasingly complex and dynamic marketplace.

Against this backdrop, this review endeavors to explore the multifaceted role of OHNs in advancing mental health promotion within workplace settings. By synthesizing current literature, best practices, and empirical evidence, this paper aims to elucidate the various strategies, challenges, and opportunities inherent in the realm of workplace mental health. From conducting psychosocial risk assessments to implementing targeted interventions and fostering a culture of support, OHNs wield a diverse arsenal of tools to effect meaningful change and create psychologically safe work environments.

In elucidating the pivotal role of OHNs in mental health promotion, this review seeks to underscore the transformative potential of integrating occupational health principles with mental health initiatives. By fostering collaboration, innovation, and advocacy, OHNs can serve as catalysts for positive change, driving organizational success while championing the well-being of employees in the process. Through a comprehensive understanding of the dynamic interplay between work, health, and well-being, OHNs are poised to lead the charge in creating workplaces where mental health thrives, and individuals flourish.



THE IMPACT OF WORKPLACE MENTAL HEALTH

The workplace environment can significantly influence mental health, with factors such as job demands, organizational culture, and work-life balance contributing to stress, anxiety, and depression among employees. Research indicates that work-related stressors not only affect individual well-being but also impact productivity, absenteeism, and organizational performance. Thus, addressing mental health in the workplace is essential for fostering a healthy and thriving workforce.

The workplace is not only a site for productivity but also a significant influencer of mental health. Various factors within the work environment can either contribute to or alleviate mental health challenges experienced by employees. Understanding the impact of workplace mental health involves recognizing the intricate interplay between organizational dynamics, job demands, interpersonal relationships, and individual well-being.

1. Job Demands and Stress: Work-related stress is one of the primary contributors to poor mental health in the workplace. High job demands, tight deadlines, and heavy workloads can lead to feelings of overwhelm, exhaustion, and burnout among employees. Moreover, the lack of control over tasks, unclear job expectations, and role ambiguity further exacerbate stress levels. Chronic exposure to these stressors increases the risk of developing anxiety disorders, depression, and other mental health conditions.

2. Organizational Culture and Climate: The culture and climate of an organization profoundly influence employee well-being. A supportive and inclusive workplace culture, where employees feel valued, respected, and empowered, fosters positive mental health outcomes. Conversely, toxic work environments characterized by bullying, harassment, and discrimination have detrimental effects on mental health. Poor leadership, ineffective communication, and a lack of transparency contribute to feelings of distrust and disengagement among employees, undermining their mental well-being.

3. Work-Life Balance: Achieving a healthy balance between work and personal life is essential for maintaining mental well-being. However, the increasing prevalence of long working hours, overtime, and a culture of presenteeism disrupts this balance, leading to stress and burnout. Employers play a crucial role in promoting work-life balance by offering flexible work arrangements, such as telecommuting, compressed workweeks, and parental leave policies. Encouraging employees to disconnect from work during non-working hours and promoting leisure activities can help alleviate stress and improve mental health outcomes.

4. Social Support and Relationships: Strong social support networks within the workplace serve as protective factors against mental health challenges. Positive interpersonal relationships, collaboration, and camaraderie enhance employee morale and resilience. Conversely, isolation, conflict, and lack of support from colleagues and supervisors increase feelings of loneliness and exacerbate mental health issues. Creating opportunities for team-building activities, mentorship programs, and peer support groups can strengthen social

connections and promote a sense of belonging among employees.

5. Career Development and Growth: Opportunities for career development, skill enhancement, and advancement contribute to employee satisfaction and motivation. However, a lack of career prospects, job insecurity, and perceived stagnation can negatively impact mental health. Investing in employee training and development programs, providing clear pathways for advancement, and recognizing employee contributions foster a sense of purpose and fulfillment in the workplace.

THE ROLE OF OCCUPATIONAL HEALTH NURSES

OHNs play a multifaceted role in promoting mental health within the workplace. Their responsibilities include conducting psychosocial risk assessments, providing counseling and support services, facilitating health education programs, and collaborating with employers to implement policies and interventions. By integrating principles of health promotion and disease prevention, OHNs can address both individual and organizational factors contributing to mental health challenges.

Occupational health nurses (OHNs) serve as pivotal figures in promoting mental health within the workplace due to their specialized knowledge and skills in both healthcare and occupational safety. Their role encompasses a wide range of responsibilities aimed at fostering a healthy work environment and supporting employees' mental well-being. Below are elaborations on key aspects of the role of OHNs in mental health promotion:

- 1. Comprehensive Health Assessment:** OHNs conduct thorough assessments to evaluate the physical, psychological, and social aspects of employees' health. This includes identifying potential risk factors for mental health issues, such as workplace stressors, job demands, interpersonal conflicts, and organizational factors. By understanding the unique challenges and stressors within the workplace, OHNs can develop targeted interventions to mitigate these risks and promote mental well-being.
- 2. Risk Management and Prevention:** OHNs play a proactive role in identifying and managing psychosocial risks within the workplace. Through regular risk assessments and hazard identification, they can identify factors contributing to stress, anxiety, and other mental health issues among employees. OHNs work closely with employers and management to implement preventive measures, such as modifying work processes, improving communication channels, and enhancing organizational policies to create a supportive and conducive work environment.
- 3. Counseling and Support Services:** OHNs provide confidential counseling and support services to employees experiencing mental health challenges. This may involve offering individual counseling sessions, crisis intervention, and referrals to mental health professionals or support groups as needed. OHNs utilize their therapeutic skills and empathetic approach to help employees cope with stress, address



personal concerns, and develop coping strategies to manage work-related challenges.

4. **Health Education and Promotion:** OHNs engage in health education initiatives to raise awareness about mental health issues and promote preventive behaviors among employees. They may organize workshops, seminars, and training sessions on stress management techniques, resilience-building strategies, and mental health literacy. By empowering employees with knowledge and skills to recognize early signs of mental health issues and seek appropriate support, OHNs contribute to a culture of health and well-being in the workplace.
5. **Policy Development and Implementation:** OHNs collaborate with employers, human resources personnel, and occupational safety committees to develop and implement policies and programs that support mental health in the workplace. This may include policies related to flexible work arrangements, employee assistance programs (EAPs), workplace accommodations, and initiatives to reduce stigma surrounding mental illness. OHNs advocate for the integration of mental health considerations into broader occupational health and safety frameworks, emphasizing the importance of addressing psychosocial factors in promoting employee well-being.

STRATEGIES FOR MENTAL HEALTH PROMOTION

Several strategies can be employed by OHNs to promote mental health in the workplace:

1. **Psychosocial Risk Assessment:** OHNs can conduct comprehensive assessments to identify workplace stressors, interpersonal conflicts, and other psychosocial factors impacting mental well-being.
2. **Education and Training:** Providing employees with education on stress management, resilience-building, and mental health awareness can empower them to recognize and address mental health concerns.
3. **Workplace Interventions:** OHNs can collaborate with management to implement interventions such as flexible work arrangements, employee assistance programs (EAPs), and mindfulness-based activities to reduce stress and promote work-life balance.
4. **Crisis Management:** OHNs are trained to respond to crises and critical incidents in the workplace, offering immediate support and coordinating follow-up services as needed.
5. **Promoting a Culture of Support:** Creating a supportive workplace culture where mental health is prioritized involves destigmatizing mental illness, promoting open communication, and fostering peer support networks.

CHALLENGES AND OPPORTUNITIES

While OHNs play a crucial role in mental health promotion, they face various challenges, including limited resources, organizational resistance, and stigma surrounding mental health. However, there are also opportunities for innovation and

collaboration, such as leveraging technology for remote support services and partnering with mental health professionals and community resources.

Occupational health nurses (OHNs) face several challenges in their efforts to promote mental health in the workplace, but they also encounter opportunities for innovation and collaboration.

Challenges

1. **Limited Resources:** One of the primary challenges for OHNs is the availability of resources, both in terms of budget and staffing. Many organizations may not allocate sufficient resources to support mental health promotion initiatives, leading to gaps in services and interventions.
2. **Organizational Resistance:** Some employers may be resistant to addressing mental health issues in the workplace due to perceived costs, productivity concerns, or stigma. Overcoming organizational resistance and gaining buy-in for mental health promotion programs can be challenging for OHNs.
3. **Stigma and Discrimination:** Stigma surrounding mental illness remains prevalent in many workplaces, deterring employees from seeking help or disclosing their mental health concerns. OHNs must address stigma through education, awareness campaigns, and fostering a culture of acceptance and support.
4. **Complexity of Mental Health Issues:** Mental health concerns are multifaceted and often interconnected with various factors such as work-related stress, personal life challenges, and underlying psychological issues. OHNs require specialized training and expertise to assess and address these complex issues effectively.
5. **Workplace Culture:** Toxic workplace cultures characterized by high levels of competition, poor communication, and lack of support can exacerbate mental health issues among employees. Changing entrenched cultural norms and promoting a healthier work environment pose significant challenges for OHNs.

Opportunities

1. **Advancements in Technology:** Technological advancements offer new opportunities for OHNs to deliver mental health support and interventions remotely. Telehealth services, mobile apps, and online resources enable OHNs to reach a wider audience and provide timely support to employees regardless of location.
2. **Interdisciplinary Collaboration:** Collaborating with mental health professionals, occupational therapists, human resources, and other stakeholders presents opportunities for OHNs to leverage diverse expertise and resources. Interdisciplinary teams can develop comprehensive mental health promotion programs tailored to the unique needs of the organization and its workforce.
3. **Policy Advocacy:** OHNs can advocate for policies and regulations that prioritize mental health in the



workplace, such as implementing legislation on psychosocial risk assessment, workplace accommodations for mental health conditions, and mandatory mental health training for managers and supervisors.

4. **Data-Driven Approaches:** Utilizing data analytics and research findings can inform evidence-based interventions and strategies for mental health promotion. OHNs can collect and analyze data on employee well-being, absenteeism, and workplace incidents to identify trends and areas for targeted intervention.
5. **Employee Engagement:** Involving employees in the development and implementation of mental health promotion initiatives fosters a sense of ownership and engagement. OHNs can leverage employee feedback, focus groups, and surveys to tailor programs to the specific needs and preferences of the workforce.

CONCLUSION

Occupational health nurses are instrumental in promoting mental health and well-being in the workplace. By employing proactive strategies, conducting risk assessments, and collaborating with stakeholders, OHNs can create environments that support employee mental health and contribute to organizational success.

Occupational health nurses (OHNs) stand at the forefront of mental health promotion in the workplace, wielding their expertise to create environments conducive to employee well-being. Through a multifaceted approach encompassing risk assessment, intervention, education, and advocacy, OHNs play a pivotal role in fostering psychologically healthy workplaces.

The significance of their role cannot be overstated, particularly in light of the growing recognition of the impact of work-related stressors on mental health. By addressing both individual and organizational factors contributing to mental health challenges, OHNs contribute not only to the health and well-being of employees but also to the overall success and sustainability of organizations.

However, this undertaking is not without its challenges. OHNs may encounter obstacles such as limited resources, organizational resistance to change, and persistent stigma surrounding mental health. Nevertheless, these challenges also present opportunities for innovation, collaboration, and advocacy. By leveraging available resources, forging partnerships with stakeholders, and championing mental health initiatives, OHNs can effect meaningful change within their organizations.

In conclusion, occupational health nurses are indispensable agents of change in the realm of workplace mental health. Their dedication, expertise, and commitment to promoting mental well-being serve as catalysts for creating healthier, happier, and more productive work environments. As we navigate the complexities of the modern workplace, the role of OHNs remains integral to realizing the vision of workplaces where

mental health is prioritized, stigma is eradicated, and employees thrive.

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OCCUPATIONAL NOUNS DENOTING GENDERALOGIC MEANING IN ENGLISH

Khujaeva Sayyora Sotimboyevna

Teacher, Urgench State Pedagogical Institute Faculty of Philology and History the Department of Foreign Philology

ABSTRACT

This study delves into the lexical means of expressing gender-related meanings in English, with a specific focus on occupational nouns. Furthermore, the core semantic meaning of some occupational nouns is analyzed.

KEYWORDS: *occupational nouns, genderalogic meaning, lexical means, grammatical gender, gender stereotypes, language evolution, gender equality, inclusivity, linguistic modernity.*

INTRODUCTION

Modern linguistics explores gender-related issues across diverse avenues, encompassing various disciplines, such as investigation into vocabulary and phraseology, exploration of gender dynamics in fiction, analysis of gender nuances in speech, study of gender in relation to nonverbal communication, examination of gender stereotypes in language, investigation into gender as a cognitive phenomenon, exploration of the intersection between gender and linguistic modernity and analysis of gender within the cultural context.

Expressing genderalogic (gender-related) meaning involves both lexical (vocabulary-related) and grammatical (structure-related) elements in a language. Lexical elements include gender-specific nouns, occupational titles, personal pronouns, titles and honorifics, relationship-related words and others. Whereas, grammatical Means encompass grammatical Gender, as some languages assign gender to nouns based on grammatical rules, unrelated to biological gender. For example, in Spanish, “table” (mesa) is feminine, while “car” (coche) is masculine. Another means of grammatical gender is the concept of gender Agreement. Adjectives, articles, and other modifiers may need to agree with the gender of the noun in some languages. For instance, in French, “grand” (big) becomes “grande” when modifying a feminine noun.

However, in English, the main way of expressing the grammatical gender happens with the help of word Formation. Derivational processes may involve gender-specific suffixes or prefixes, creating words that explicitly indicate gender.

However, in this paper we mainly pay attention to lexical means of expressing genderalogic words in English, in particular occupational words.

MATERIALS AND METHODS

The issue of gender specifications in terms occupational units have been studied by foreign scientists, including S.Lipovsky [3], K.Lassonde [2], J.Oksanen [4], J.Sibanda, M.Begede [5] and others. According to J.Kim “occupational stereotypes were determined, with gender stereotypicality found to affect the perceived importance of each stereotype to at least some

degree. Along with traditional gender stereotype categories (i.e., feminine and masculine), the categories of unfeminine and unmasculine also emerged [4]”. It means that the identification of occupational stereotypes and their correlation with gender stereotypicality highlights the complex interplay between societal perceptions and professional roles. The acknowledgment that gender stereotypes impact the perceived importance of these occupational stereotypes underscores the pervasive influence of societal norms on our understanding of different professions.

As the literature analysis show, the main direction of the studies on occupational nouns is the neutralization of gender-specific words.

RESULTS AND DISCUSSION

Many occupational nouns in English have distinct titles for men and women, indicating gender specificity, such as actor/actress, waiter/waitress, steward/stewardess, host/hostess, waitstaff/waitress, manager/manageress, author/authoress, poet/poetess, police man/policewoman, fireman/firewoman, congressman/congress woman, chairman/chairwoman, salesman/saleswoman, business man/businesswoman, mailman/mailwoman, cameraman/camera woman, electrician/electricianess. Gender-specific suffixes, such as “-ess” or “-man,” are employed to create female counterparts for certain occupations. Examples include “steward” and “stewardess” or “waiter” and “waitress.”

Actor/Actress: Both terms refer to individuals involved in acting, with “actor” being the gender-neutral term and “actress” denoting a female actor.

Semantic Aspect: The terms are semantically linked to the profession of acting, irrespective of gender, emphasizing the performance aspect.

Waiter/Waitress: “Waiter” is the gender-neutral term, while “waitress” is the feminine form used to denote a female individual serving in a restaurant or similar setting.

Semantic Aspect: Both terms refer to individuals engaged in serving food and drinks, with gender-specific language.



Steward/Stewardess: “Steward” is the gender-neutral term, while “stewardess” is the feminine form used for a female flight attendant or ship crew member.

Semantic Aspect: These terms denote individuals responsible for passenger services on planes or ships, with the gender distinction historically present.

Host/Hostess: “Host” is the gender-neutral term, while “hostess” refers to a female host or presenter.

Semantic Aspect: Both terms are associated with the role of hosting, presenting, or welcoming guests, with a gender-specific distinction.

Waitstaff/Waitress: “Waitstaff” is a gender-neutral term encompassing all individuals serving in a restaurant, while “waitress” specifically denotes a female server.

Semantic Aspect: Both terms refer to individuals involved in serving food, but “waitress” carries a gender-specific connotation.

Manager/Manageress: “Manager” is the gender-neutral term, while “manageress” refers specifically to a female manager.

Semantic Aspect: Both terms denote individuals in a managerial role, with “manageress” highlighting the gender of the person in the position.

The commonality lies in the use of gender-specific suffixes (“-ess”) to denote the feminine form of the occupation. Historically, these distinctions were prevalent, reflecting societal gender norms in occupational language.

Historically, the balance of gender-specific occupational terms has been skewed, with many professions having male-dominated titles. However, efforts towards gender-neutral language are influencing changes, encouraging more inclusive and balanced terminology. Societal changes and increased awareness of gender equality are leading to shifts in perception, influencing language use. Some occupations, once exclusively associated with one gender, are now adopting gender-neutral terms to reflect changing societal norms. For example:

Flight Attendant. Traditionally known as “stewardess” for women and “steward” for men, the term has evolved to the gender-neutral “flight attendant,” reflecting the inclusive nature of the profession.

Server: In the hospitality industry, the traditional terms “waiter” and “waitress” are increasingly replaced by the gender-neutral term “server” to encompass individuals of any gender.

Police Officer: The term “policeman” is being replaced by the more inclusive “police officer” to acknowledge and embrace the increasing representation of women in law enforcement.

Firefighter: The shift from “fireman” to “firefighter” signifies the acknowledgment of women serving in firefighting roles, challenging the previously male-centric language.

Salesperson: In retail and sales, the term “salesman” has given way to the more inclusive “salesperson” to accommodate individuals of any gender working in the field.

The adoption of gender-neutral terms in certain occupations reflects a semantic shift driven by changing societal norms. This evolution is rooted in the recognition that professional roles should not be confined or defined by gender. The semantic analysis of these examples reveals inclusivity, which shift to gender-neutral terms promotes inclusivity by recognizing that individuals of any gender can excel in a particular profession.

This semantic change signifies a move towards gender equality, dismantling stereotypes that traditionally associated specific jobs with a particular gender. Gender-neutral terms emphasize the professional identity of individuals over their gender, contributing to a more egalitarian representation in various fields. They acknowledge and reflect the diversity within professions, eroding the notion that certain jobs are exclusive to one gender.

CONCLUSION

In conclusion, the analysis of occupational nouns in English reveals a dynamic interplay between traditional and evolving language norms. Gender-specific titles have historically dominated certain professions, but efforts towards inclusivity are driving a shift towards gender-neutral language. The influence of gender stereotypes on occupational perceptions highlights the broader societal impact on linguistic choices. The adoption of gender-neutral terms in occupations exemplifies a linguistic response to societal changes, demonstrating a commitment to equality and breaking away from traditional gender stereotypes in professional contexts.

Historically, gender-specific suffixes and titles have created distinct occupational terms for men and women. However, contemporary linguistic trends emphasize the importance of gender-neutral language to promote inclusivity and equality. Examples such as “flight attendant” and “police officer” illustrate this semantic shift, reflecting changing societal norms and challenging traditional gender associations in professions.

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SEMANTIC REPRESENTATION OF THE CONCEPT “LEADERSHIP” IN THE NOVEL “CALL OF THE WILD” BY J. LONDON

Ermetova Jamila Ismailovna¹, Babajanova Yulduz Igorovna²

¹Professor, Head of the Department of Foreign Language and Literature, UrSU,

²Master of Linguistics, UrSU

ABSTRACT

This article discusses the interpretation of the concept of “leadership” in the novel “Call of the wild” by J.London. The article highlights that leadership involves attributes such as superiority, exclusivity, power, control, cooperation, and emotional intelligence. Therefore, the article will focus on research in different fields that explore these characteristics of the leadership concept.

KEYWORDS: leadership, semantic representations, lexical nomination, physical prowess, physical resilience, mental fortitude, mental adaptability.

The semantic realization of the concept “Leadership” in the English culture has deep roots throughout history. Interesting linguistic data were obtained by Y.S.Vashtalova, who analyzed ideas about “Leadership” based on data from the FrameNet project by Ch.Fillmore and her own association experiment with American respondents. She came to the conclusion that in American linguistic culture “leadership implies dominance” and is primarily associated with the figure of the president [1]. This researcher examines the use of this value to frame the

situation in the speeches of US politicians. However, in this work we are interested in how this concept is expressed in the novel “Call of the wild”. Our research was carried out using the method of conceptual analysis, discourse analysis, definitional analysis, linguocultural analysis, quantitative method and elements of content analysis. Based on these methods we analyzed the concept and as a result, determined 10 dominant semantic representation of the leadership (Figure 1).

Figure 1. Dominant semantic representation of the leadership in the novel “Call of the Wild” by J.London

N	Semantic representation of the concept leadership	Number
1	Power/strength	5
2	Primary/leading position	5
3	Supremacy/superiority	3
4	Characteristics/personality	3
5	Pride	3
6	Authority/dominance	2
7	Control	1
8	Exclusivity	1
9	Responsibility	1
10	Physical features	1

As the table shows, the main semantic representations of the concept leadership belong to the categories “power/strength” and “primary, leading position”. The features of “supremacy/superiority”, “characteristics/personality” and “pride” showed relatively lower results, while the categories “control”, “exclusivity”, “responsibility” and “physical features” are proved to be the lowest features of the leadership.

POWER/STRENGTH

First of all, it should be noted that the first most important conceptual components of the leadership in the novel is the idea of power and strength. This is supported by a fairly high

frequency of use of units representing the paradigm of the lexical nomination strength – strengthen – strong – strongly. Let’s analyze the examples.

He alone endured and prospered, matching the husky in strength, savagery, and cunning.

Strength here is described in terms of physical prowess and resilience. The character is portrayed as enduring and prospering despite challenges, matching the husky in “strength, savagery, and cunning”. This suggests strength not only in terms of physical power but also in terms of mental fortitude and adaptability.



With the last remnant of his strength he managed to stagger along behind till the train made another stop, when he floundered past the sleds to his own, where he stood alongside Solleks.

The use of “last remnant of his strength” suggests depletion or near exhaustion of physical energy. Despite this, the character manages to continue forward, showcasing determination and resilience in the face of adversity.

And often, such was the communion in which they lived, the strength of Buck’s gaze would draw John Thornton’s head around, and he would return the gaze, without speech, his heart shining out of his eyes as Buck’s heart shone out.

Here, strength is depicted in a more metaphorical sense, as the power of a gaze to convey emotion and connection. The strength of Buck’s gaze is potent enough to draw the attention of John Thornton and elicit a non-verbal exchange of emotion, indicating a strong bond between them.

When he felt him grasp his tail, Buck headed for the bank, swimming with all his splendid strength

Buck’s “splendid strength” is portrayed through physical action, specifically in swimming with vigor towards the bank. This example emphasizes strength as a measure of physical capability and stamina.

He had great faith in Buck’s strength and had often thought him capable of starting such a load; but never, as now, had he faced the possibility of it, the eyes of a dozen men fixed upon him, silent and waiting.

In this example, strength is associated with capability and potential. John Thornton has “great faith in Buck’s strength, “viewing him as capable of handling challenging tasks. This demonstrates strength not only in physical terms but also in terms of trust and belief in one’s abilities.

Semantic analysis of the concept leadership in terms of its component “power/strength” showed that leader’s strength is represented as a physical endurance, resilience and adaptability, determination and persistence, emotional connection and bond, physical capability and vigor, trust and belief in one’s capability.

PRIMARY, LEADING POSITION

This component of the concept leadership in the novel is revealed, when characterizing the leading position of the dogs in the pack. This specific feature is represented by the key terms, such as “lead-dog”, “leading”, and “leader”.

From then on it was war between them. Spitz, as lead-dog and acknowledged master of the team, felt his supremacy threatened by this strange Southland dog.

In this passage, the concept of strength is intertwined with dominance and leadership within a pack of dogs. Spitz, as the lead dog, feels his supremacy threatened by Buck, a newcomer. This triggers a power struggle, where both dogs assert their pride and desire for dominance. Buck’s actions of openly challenging Spitz’s leadership and deliberately interfering with

his duties demonstrate his own strength and ambition to assert dominance within the pack.

Likewise it was this pride that made him fear Buck as a possible lead-dog. And this was Buck’s pride, too. He openly threatened the other’s leadership. He came between him and the shirks he should have punished. And he did it deliberately.

The passage highlights how pride can be a source of strength but also vulnerability. Spitz fears Buck as a potential threat to his leadership, driven by his own pride and desire to maintain dominance within the pack. Similarly, Buck’s pride fuels his ambition to assert himself as a leader, instilling fear in Spitz and challenging the existing hierarchy.

This ecstasy, this forgetfulness of living, comes to the artist, caught up and out of himself in a sheet of flame; it comes to the soldier, war mad on a stricken field and refusing quarter; and it came to Buck, leading the pack, sounding the old wolf-cry, straining after the food that was alive and that fled swiftly before him through the moonlight.

This passage illustrates strength as instinctual and primal, particularly in the context of pursuit. Buck’s ecstasy and forgetfulness of living are likened to that of an artist absorbed in creation or a soldier consumed by the frenzy of battle. As Buck leads the pack in pursuit of prey through the moonlit wilderness, his strength manifests in his relentless drive and determination to secure food for himself and the pack.

Buck trotted up to the place Spitz would have occupied as leader; but Francois, not noticing him, brought Solleks to the coveted position. In his judgment, Solleks was the best lead-dog left. Buck sprang upon Solleks in a fury, driving him back and standing in his place.

Here, strength is depicted as the ability to assert dominance and challenge established hierarchies. Buck, recognizing his own capability and desiring the leadership position, confronts Solleks, who is favored by Francois for the coveted lead-dog role. Buck’s actions of driving Solleks back and claiming the leadership position demonstrate his strength and determination to rise in rank within the pack.

Buck led the pack, sixty strong, around bend after bend, but he could not gain. He lay down low to the race, whining eagerly, his splendid body flashing forward, leap by leap, in the wan white moonlight. And leap by leap, like some pale frost wraith, the snowshoe rabbit flashed on ahead.

In this passage, strength is portrayed through physical prowess and endurance. Buck leads the pack in a relentless pursuit of a snowshoe rabbit, demonstrating his strength and agility as he races through the snowy terrain. Despite his efforts, Buck struggles to gain ground on the elusive prey, highlighting the challenges and persistence required to achieve one’s goals.

The semantic analysis of the second main component of the concept leadership reveals that the sub-concept “primary and leading position in a group” is closely linked to dominance and leadership, pursuit and instinct, pride, strength and persistence and physical prowess within the context of a pack of dogs



navigating the wilderness. It encompasses not only physical strength but also mental fortitude, determination, and the drive to assert dominance and achieve one's objectives.

SUPREMACY/SUPERIORITY

The idea of dominance prevails, as it stems from all the others and is inextricably linked with them, especially with comparing the qualities of the main hero Buck. As in the examples:

From then on it was war between them. Spitz, as lead-dog and acknowledged master of the team, felt his supremacy threatened by this strange Southland dog.

The statement "From then on it was war between them" sets the tone for a power struggle between Buck and Spitz. This conflict arises from Spitz feeling his dominance threatened by Buck's arrival, indicating that strength is closely tied to the ability to assert dominance and maintain control within the pack.

At a bound Buck took up the duties of leadership; and where judgment was required, and quick thinking and quick acting, he showed himself the superior even of Spitz, of whom Francois had never seen an equal.

Buck quickly assumes the role of leadership, showcasing his strength in decision-making, quick thinking, and action. Despite Spitz's reputation as the lead-dog, Buck demonstrates his superiority in judgment and agility, positioning himself as a formidable contender for leadership within the pack.

Buck simply smothered him by virtue of superior weight, and cut him up till he ceased snapping and began to whine for mercy.

Buck's physical strength becomes evident in his ability to overpower Spitz. Despite Spitz's experience and status as the acknowledged master of the team, Buck asserts his dominance through sheer force and superior weight. This highlights how physical strength can play a crucial role in establishing and maintaining leadership within a hierarchical structure. Buck's method of subduing Spitz by "smothering him by virtue of superior weight" illustrates his strategic approach to conflict resolution. By using his physical strength to assert dominance, Buck effectively gains control over Spitz, forcing him to submit and cease resistance. This demonstrates how strength can be utilized not only for aggression but also for strategic maneuvering and control in power struggles.

All in all, the superiority and supremacy of the heroes in terms of leadership is demonstrated in both physical and personal characteristics of the heroes, encompassing qualities such as decision-making, physical dominance, and strategic maneuvering within the context of interpersonal conflict and power dynamics.

CHARACTERISTICS/PERSONALITY

This passage provides insight into the personality and leadership style of Spitz, the established leader of the pack:

Spitz was the leader, likewise experienced, and while he could not always get at Buck, he growled sharp reproof now and again, or cunningly threw his weight in the traces to jerk Buck into the way he should go.

Spitz is portrayed as an experienced leader who commands authority within the pack. His leadership is characterized by confidence and assertiveness, reflecting his years of experience in navigating the challenges of the wilderness and leading the team of sled dogs. Spitz communicates his leadership through various means, including growling sharp reproofs and using cunning tactics to assert control. This suggests that he employs both verbal and non-verbal cues to enforce discipline and maintain order within the pack. Spitz's occasional growling of sharp reproofs indicates his willingness to correct and discipline members of the pack when necessary. This suggests that he maintains discipline through a combination of assertive communication and physical coercion, reinforcing his position of leadership and control.

At a bound Buck took up the duties of leadership; and where judgment was required, and quick thinking and quick acting, he showed himself the superior even of Spitz, of whom Francois had never seen an equal.

This passage provides insight into Buck's assumption of leadership within the pack and contrasts his leadership style with that of Spitz. Buck's swift transition into a leadership role demonstrates his natural aptitude for assuming responsibility and authority. He wastes no time in taking up the duties of leadership, indicating a strong sense of initiative and confidence in his abilities. Buck's leadership is characterized by his superior judgment, quick thinking, and swift action. In situations where split-second decisions are required, Buck consistently demonstrates his ability to assess the circumstances and respond effectively, showcasing his mental acuity and agility. The passage explicitly states that Buck proves himself superior even to Spitz, who is established as a highly capable leader. This comparison underscores Buck's exceptional leadership qualities and suggests that he surpasses Spitz in terms of strategic thinking, decision-making, and overall effectiveness as a leader.

So long as that were not interfered with, they did not care what happened. Billee, the good-natured, could lead for all they cared, so long as he kept order.

The dogs' primary concern is maintaining order within the pack and ensuring that the established hierarchy remains intact. As long as order is maintained, they are indifferent to who assumes the leadership role or takes charge of leading the team.

PRIDE

It was inevitable that the clash for leadership should come. Buck wanted it. He wanted it because it was his nature, because he had been gripped tight by that nameless, incomprehensible pride of the trail and trace that pride which holds dogs in the toil to the last gasp, which lures them to die joyfully in the harness, and breaks their hearts if they are cut out of the harness.

In this passage, pride emerges as a significant sub-concept of leadership, influencing Buck's desire for leadership and shaping his behavior within the context of the sled dog team. Buck's desire for leadership is driven by a sense of pride deeply



ingrained in his nature. This pride is described as “nameless” and “incomprehensible”, suggesting that it is an instinctual and intrinsic aspect of his identity as a sled dog. The passage highlights a specific manifestation of pride associated with the “trail and trace”, referring to the hardships and challenges of sled dog work. Buck takes pride in his endurance and dedication to the task, symbolized by his willingness to work until his last gasp and even to die joyfully in the harness. This pride in endurance reflects a key aspect of leadership, as leaders often set an example through their resilience and commitment to the group’s goals.

Like, who had been trembling abjectly, took heart at this open mutiny, and sprang upon his overthrown leader. Buck, to whom fairplay was a forgotten code, likewise sprang upon Spitz.

In this passage, the dynamics of leadership and pride are evident through the actions of the dogs, particularly in response to a perceived challenge to authority. The dogs’ responses, particularly Buck’s and “like’s” (Spitz’s), highlight their own pride and desire for dominance. Despite fair play being described as a forgotten code for Buck, suggesting a departure from traditional notions of fairness and equity, his instinctual response to the mutiny is to assert himself and challenge Spitz’s leadership. This underscores the role of pride in driving individuals to assert their dominance and strive for leadership positions within the pack hierarchy. The passage illustrates the interplay between pride, leadership, and survival instincts within the pack of dogs. It highlights how challenges to authority can embolden individuals to assert themselves and vie for dominance, even if it means abandoning principles of fairness and equity. In this harsh and competitive environment, pride becomes a driving force behind the struggle for leadership and survival.

But Buck was in open revolt. He wanted, not to escape a clubbing, but to have the leadership. It was his by right. He had earned it, and he would not be content with less.

In this passage, Buck’s revolt against the existing leadership and his desire to claim leadership for himself are emblematic of the intertwining of pride and leadership within the pack dynamics. Buck’s decision to openly revolt against the established leadership, represented by Spitz, shows his ambition and determination to ascend to the position of leader. His revolt signifies a rejection of the current power structure and a bold assertion of his own capabilities and worthiness for leadership. Buck’s belief that leadership is his “by right” reflects a strong sense of entitlement and pride in his own abilities. He perceives leadership not merely as a position of authority but as something he has earned through his actions and contributions to the pack. This sense of entitlement further fuels his determination to claim leadership and assert his dominance.

In conclusion, based on the methods of the conceptual analysis, discourse analysis, definitional analysis, linguocultural analysis, quantitative method and elements of content analysis, 10 dominant semantic representation of the leadership “power/strength”, “primary, leading position”,

“supremacy/superiority”, “characteristics/personality”, “pride”, “control”, “exclusivity”, “responsibility”, “physical features” were determined.

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THE ROLE OF SMART CITY POLICY IN IMPROVING THE QUALITY OF LIFE IN SERANG CITY BANTEN

Mulyadi¹, M. Harry Mulya Zein^{2*}

^{1,2}Lecturer of Governance Institute of Home Affairs (IPDN), Jakarta, Indonesia

Article DOI: <https://doi.org/10.36713/epra16114>

DOI No: 10.36713/epra16114

ABSTRACT

This research examines the implementation of smart city policy in Serang City, Banten Province, Indonesia, in the context of local government reform from a centralised to a decentralised system. The main objective is to analyse how smart city policy can improve people's welfare through integrating information technology in e-government, e-budgeting, e-planning, environmental management, and urban planning. The methodology used is a descriptive analysis design with a qualitative approach involving direct data collection in the field and observation of social interactions. The results show that the effectiveness of smart city policy implementation in Serang City is influenced by five main dimensions: environmental conditions, inter-organizational relationships, available resources, characteristics of implementing agencies, and the quality of public services. These factors interact with each other to support or hinder the achievement of policy objectives. This study concludes that the success of smart city policies depends on technology and the ability to manage resources, inter-organizational coordination, and human resource quality development. Continuous evaluation and adjustment of policies and practices are needed to create sustainable and inclusive solutions to improve people's quality of life.

KEYWORDS: Decentralization, Smart City, Serang City, Policy Implementation

INTRODUCTION

The reform process of local governance in Indonesia is characterised by a change in the system from centralised to decentralised. This reform began with the implementation of Law No. 22/1999, later revised through Law No. 32/2004, and finally became Law No. 23/2014 on Regional Government. This law, together with Government Regulation No. 38/2007, regulates the implementation of government affairs, including mandatory and optional affairs by Provincial and Regency/City Governments, promoting the principle of autonomy.

The concept of decentralisation in Law No. 23/2014 emphasises the transfer of government affairs by the central government to autonomous regions to regulate and manage their government affairs and the interests of local communities. This allows regions to form and implement policies based on the initiatives and aspirations of their communities, as well as to develop regional economic capabilities, improve community welfare, and encourage the enforcement of human rights and democracy.

In the context of this problem, implementing the smart city concept in Indonesia is a special focus, where local governments compete to implement it to improve the community's welfare. The smart city concept is expected to integrate information technology in e-government, e-budgeting, and e-planning, as well as in environmental management and urban planning (Yin et al., 2015). However, challenges in its implementation include cost and human resource constraints.

This research also highlights the importance of innovation in local governance, as described in Chapter XXI of Law No. 23/2014, to improve efficiency, effectiveness, and public services. This is considered vital in facing society's increasingly complex demands and making government meaningful to its people.

In particular, this research focuses on Serang City, Banten Province, as a case study in its efforts to become a smart city. Serang City was chosen because of its potential as a livable, investment, visitation and e-city city, supported by its strategic location in the industrial, trade and service areas. This research examines Serang City's efforts to manage its urban problems and potential to develop the smart city concept in the context of local economic development, improving people's quality of life, and the social and economic challenges it faces.

METHODOLOGY

This study aims to analyse the implementation of smart city policies to improve community welfare in Serang City, Banten Province. The method chosen is a descriptive analysis design with a qualitative approach, which allows researchers to understand phenomena in their natural context through direct data collection and observation of social interactions. This research is planned to take place from February to March 2024.

In this study, data collection procedures were carried out through two main stages: the pre-field and field stages. The pre-field stage includes initial preparations before data collection, while the field stage includes direct data collection activities at the research location. The data needed includes information



related to the implementation of smart city policies, which are detailed in the duties, functions, rights and obligations of local governments by the limits of their constitutional authority.

The determination of informants was carried out through purposive techniques, which included selecting individuals who were considered capable of providing information about implementing smart city policies in Serang City. The selected informants included various stakeholders, such as the Chairman of the DPRD of Serang City, the Regional Secretary, the Economic and Development Assistant, relevant SKPDs, Sub-districts, Company Directors, and religious, community and youth leaders.

Data collection techniques were conducted through literature studies, interviews, and observations. Data analysis was done by checking data validity through triangulation, which involved determining data classification, editing, coding, structured data presentation, data confirmation to strengthen the validity of the information obtained, and data interpretation to reveal actual and factual research problems.

The research location in Serang City was chosen because of the city's efforts in implementing the concept of e-government as part of the smart city initiative, including regulation, development, empowerment, and public services. This condition makes Serang City a relevant case to be studied in the context of smart city policy implementation and its impact on improving community welfare.

RESULTS AND DISCUSSION

This research reveals that the implementation of smart city policies in Serang City, Banten Province, is influenced by various factors that can be grouped into five main dimensions: environmental conditions (Chourabi et al., 2012), inter-organizational relationships, available resources, characteristics of implementing agencies, and the quality of public services. These factors interact with each other in supporting or hindering the realisation of policy objectives to improve community welfare.

1. Environmental Conditions: Local social, economic, and political conditions affect the substance and implementation of policies. The active involvement of communities and other stakeholders is considered essential in this process.
2. Interorganizational Relationships: Coordination and collaboration between various government and non-government organisations have proven important in supporting successful policy implementation.
3. Available Resources: The availability and management of resources (human, financial, and information) play a critical role in the effectiveness of policy implementation (Nam & Pardo, 2011).
4. Implementing Agency Characteristics: Policy implementers' motivation, competence, and commitment to the objectives and processes significantly impact the final results.
5. Public Services: The quality of public services, including tangibles, reliability, responsiveness, assurance, and empathy, are important indicators in measuring the

success of smart city policy implementation (Garcia et al., 2016).

The analysis shows a gap between policy objectives and the reality of implementation caused by various factors. First, there is variability in environmental conditions that affect policy adaptation (Kenneth, 2022). Second, challenges in inter-organizational relations indicate the need for better cooperation and coordination between sectors (Masud & Khan, 2024). Third, limited resources are a major obstacle, especially financially and humanely (Ambreen, 2022). Fourth, the characteristics of implementing agencies highlight the importance of building internal capacity and employee motivation. Fifth, aspects of public service (Neirotti et al., 2014) emphasise the need for improvement in all dimensions to meet public expectations (Khalil & Weber, 2020).

Implementing smart cities involves utilising technology, data and public services to improve urban life. Supporting research on smart cities in Europe by (Caragliu et al., 2011) highlights technology integration in the urban environment. In addition, research such as that conducted by (Putra et al., 2020) measuring the maturity of smart public services emphasises the importance of efficient public service delivery in smart city initiatives. In addition, (Elanda et al., 2022) ensure inclusivity and responsiveness in policy development. In addition, research by (Pati et al., 2022) underscores the importance of utilising digital platforms for efficient and innovative public service delivery in smart cities.

CONCLUSION

The conclusion of this study underlines that the implementation of smart city policy in Serang City, Banten Province, is an integrated complex process involving various important dimensions such as environmental conditions, inter-organizational relationships, availability of resources, characteristics of implementing agencies, and quality of public services. This research confirms that the success of smart city policy depends not only on applying the latest technology but also on the ability to utilise existing resources, ensure effective coordination between organisations, and especially support and develop the quality of human resources involved in implementation. Furthermore, this research shows that to improve people's welfare through smart city policies, a joint commitment from all stakeholders, local governments, the private sector, and communities must work together to create innovative solutions responsive to local needs and challenges. Smart city policies should be geared towards achieving a broader goal than just the application of technology: improving people's quality of life. This requires continuous evaluation and adjustment of policies and practices to ensure that smart city initiatives effectively provide sustainable and inclusive solutions for all levels of society in Serang City.

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THE FUNCTIONAL ESSENCE OF ORATORY

Aziza Khasanovna Aripova

University of World Economy and Diplomacy, Associate Professor of the Department of Uzbek and Russian Languages, Ph.D.

ABSTRACT

This article highlights the phenomenon of speech culture, which is interpreted as a two-stage linguistic process (speech skill) in the teaching of speech culture and the analysis on the fact that a single, perfect scientific definition of the concept of speech culture has not been created, the need to get to the essence of this phenomenon before describing it, to acquire the full scientific essence of the concept and public speaking skills, as well, differences in speech activity in reaching the level of a professional speaker and many facts are provided.

KEY WORDS: *oratory of antiquity, speech culture, oratory, stylistics, speech phenomenon, speech skill.*

Oratory is, first of all, an art, the ability to speak orally and in writing. When the classification of oratory was on focus in the past, it was primarily related to poetry and the art of acting. It is known that these types of arts are interrelated. Both poets and masters of art and orators studied the science of rhetoric in antiquity oratory. For example, Aristotle in his work "Rhetoric" talked about the interrelated aspects of rhetoric and poetry and said that what connects these two arts is a skillful speech. And Cicero used acting methods in his speech process.

Oratory is a unique skill. That is, an attractive, skillful way of speaking. With these features, it is superior to other arts. About this V.G.Belinsky writes that "Poetry is included as an aspect of oratory, reciting beautiful poetry is not the goal of oratory, but a means of improving speech skills" [6].

Determining the essence of oratory is largely related to the interpretation of the relationship of this speech phenomenon to a number of other close linguistic phenomena, and their common and different aspects. Here we are considering the relationship of speech culture and methodology of oratory.

It is known that speech culture, rhetoric and methodology all study the phenomenon of speech. Moreover, all this helps the speech to be correct, effective, and appropriate. For this reason, at first glance, they seem to be fundamentally different phenomena that study the same linguistic object. In fact, these fields are interrelated, independent scientific directions that study the phenomenon of speech from different angles. However, the specific purpose of these fields is to ensure that the process is properly structured and implemented.

It is known that the scientific direction called speech culture appeared at the beginning of the 20th century, but it began to develop widely in the 1960s. Due to the fact that speech culture is a new scientific concept, the essence of this phenomenon is interpreted differently by different researchers. Professor E.Begmatov comes to this conclusion, analyzing more than 30 of such definitions: "All the mentioned facts indicate that a

single, perfect scientific definition of the concept of speech culture has not yet been created. Before describing a phenomenon, it is necessary to get to its essence. The lack of a definition that can perfectly express the concept of speech culture is actually related to the fact that the full scientific essence of this concept is still insufficiently defined" [7].

E.Begmatov summarized definitions of speech culture and divided them into 10 groups.

In the science of speech culture, the phenomenon of speech culture is interpreted as a two-stage linguistic process (speech skill): "The first stage (lower level) in speech culture is the correctness of speech. The correctness of speech is mastering the literary language and its norms... The second stage of mastering the literary language is the speech culture in the full sense" [8].

It is clear that any person who rises to the level of a literary language user and an artistic orator must go through the above two stages of speech culture. In that case, one's mastery of oratory and reaching the level of a professional speaker can be considered as the third stage - the highest stage - in his speech activity. In this sense, oratory is a state in which a person's speech activity, skill, and competence are elevated to the level of speech art.

Despite the noted connections between speech culture and oratory, these two phenomena and fields have their own distinct aspects. Such differences can be seen in the purpose of speech culture and oratory, linguistic material, the object of examination, the factors that cause them, the level of their use and distribution, the persons who implement speech culture and oratory, the structure of speech, etc. An extensive analysis of the difference between speech culture and oratory can be found in the works of E. Begmatov. In the book "Basics of Speech Culture and Stylistics" of the collective authors, there is a title "Speech Culture and the Art of Oratory", in which E.Begmatov showed 2 differences between these two phenomena. This author considers oratory to be a separate art and skill, different



from speech culture: “Everyone can speak if they are not born with a speech defect (unless they are mute or stuttering). But not everyone is very talkative. Oratory in the classical sense is a special, extraordinary speech art. Real oratorical skill (art) is achieved as a result of continuous work on one’s language and speech along with natural ability” [9].

This author continues his comments and states the following: “Any speech is not an example of oratory (as an art), and its owner is not a true speaker (in the sense of an artist). Since ancient times, oratory has been interpreted as a special skill, an art, in the form of an unusual, unique ability of a person” [9].

The most important sign of oratory is indicated in the mentioned comments. But there are important differences between oratory and speech culture. E.Begmatov pointed out the following differences:

1. The phenomenon of speech culture is related to literary language. Whereas, for oratory, this is not the main sign. A person who can speak skillfully and impressively in his own language can also be an orator.
2. Public speaking is essentially an oral speech. Speech culture refers to both oral and written forms of speech.
3. The speech culture refers to the society or the majority. Oratory refers to the speech of an individual(s).
4. The field of speech culture also aims to bring the literary language to certain standards [10]. Oratory does not set such a goal for itself.
5. Speech culture involves a simple stage known as a speech stage, while oratory is a high-level form of speech that requires artful use of language and exceptional speech skills.

There are also important common aspects between speech culture and oratory. First of all, these two fields are aimed at improving and perfecting human speech activity. Secondly, the activities carried out in the field of speech culture serve to form a person’s oratorical ability. This feature is especially evident in the speech of orators who speak literary language. Also, educating skilled orators, perfecting human speech is the complete and ideal goal not only of the field of oratory but also of the field of speech culture.

From the above analysis, it can be seen that although speech culture and oratory are interconnected and have common aspects, these two phenomena and fields differ according to their specific goals and tasks.

The relationship between oratory and speech styles, in other words, functional styles, is one of the problems that have not been specifically studied yet. At the heart of such a problem, in our opinion, there are two important points of view: the first is the relation of oratory to functional styles, and the second is one of the functional styles of oratory, to be more precise, the question of whether there is a style of speech called oratory style. If oratory is considered a speech style, does it have an independent linguistic object or material?

It is known that stylistics)is now fully recognized as an independent field of linguistics and formed as a scientific direction, and 5 speech styles are recognized in the studies of methodology. These are: colloquial style, official style, scientific style, publicist style, artistic style [11].

But in some works, it is noted that there are other types of styles: “The types of written style are mainly the following: 1) Artistic style, 2) Popular (publicistic) style, 3) Official-business style, 4) Scientific style, 5) Oratory style, 6) Official-book style, 7) Mixed style [12]”. The mentioned idea differs from the traditional classification recognized in the field of methodology until now in that it is quite limited. These are the following:

1. Oral speech style is considered separately and is not listed among functional styles;
2. Oratorical style, mixed styles are also considered to exist;
3. The official style is divided into two independent styles;
4. The speech style (oratory) is not considered an oral form of speech, but a written form;
5. In some literature, it is mentioned that the neutral style is also distinguished as a separate type, etc [12].

In the case in question, the rhetorical style is explained as follows: “Rhetorics is mainly expressed by means of positive words and phrases, rhetorical interrogative sentences, and complex sentences. Rhetorical style has historically been an independent style and it would not be correct to say that it “belongs to the oral type of publicist (oratory) style [12].” It can be seen from the quoted opinion that its authors once again deny that rhetorics is a form of oral speech. Of course, putting the issue in this way, in our opinion, is controversial.

Now let’s focus on the relation to the functional styles of oratory.

Usually, the recognition of a linguistic event as an independent category is related to its having its own independent language material. Approaching the issue from this point of view, Professor E.Begmatov comes to the conclusion that methodological norms do not have their own independent normative units, i.e. language units, and writes: “Stylistic norms are the situation or feature of the use (branching) of language tools according to each stylistic criterion”. So, the stylistic norm is not just the norms that are language tools, rather, it is the situation of applying those norms in practice. Thus, stylistic norms are functional, i.e. activity norms of language norms [13].

The following opinion of V.I.Kodukhov is also presented in this work: “Language styles are a communicative and functional form of the language norm” [14].

So, it is clear from the above opinion that each of the functional styles does not have its linguistic material, independent linguistic norms, rather, it is the expression and application of language norms in each speech style in its own way.

However, it should be noted that functional methods work with speech texts and text units, not with separate normative tools.



For example, the separation of the scientific method is due to the presence of scientific texts in the Uzbek language, and the separation of the artistic style is due to the presence of artistic texts and the language of fiction.

Therefore, to recognize the existence of a speech style is to recognize the existence of a speech text that is considered to be

Functional styles:	Linguistic material
1. Scientific style	the language and texts of scientific research
2. Official style	the texts of official documents and business
3. Publicist style	texts written with the intention of being understandable to the general public
4. Artistic style	texts of fiction
5. Colloquial style	simple conversation between people, speeches representing the oral speech process, their written texts

At first glance, it seems that the style of oratory has its own independent speech texts, like others. Because artistic speakers also speak, and it can be recorded (on a tape recorder or in the form of a written text) and this creates a certain speech text.

But two features complicate matters here: firstly, oratorical speech does not rely on originality (specificity of artistic speech or scientific speech), one does not repeat the other. Secondly, oratorical speech can appear in all of the above-mentioned styles, so it can belong to all styles. In other words, an artistically expressed speech can be on a scientific topic, an official topic, an artistic topic, or a journalistic topic.

So, oratory speech cannot be limited in the same way as functional styles are limited. In fact, a speech belonging to oratory, that is, a skillfully and artistically spoken speech, can belong to any of the functional styles. So, an oratorical speech is a perfect speech given in any speech style. It is understood that an artistic, eloquent speech belonging to any functional style can be an example of oratorical speech.

It is clear from what has been said that oratorical speech does not stand in line with functional styles, rather, it is the speech perfection achieved in those styles. In this sense, it is controversial to consider oratory as a type or form of speech style, like functional styles.

It is also clear from what has been mentioned that oratorical speech can be expressed in any of the mentioned styles. It all depends on the methods, tools, and factors of speech delivered in these styles to the level of speech art. The main task of the

its example. In this sense, to consider oratorical style as existing is to recognize that it has independent speech material, speech text, and linguistic tools. Based on this principle, the speech material of the 5 functional styles recognized by many, that is, the linguistic material on which it is based consists of the following:

scientific field of oratory is to study the methods and ways of simple, correct speech to reach the level of speech art.

Poetry, acting skills and oratory are, first of all, each of them is a separate form of art. Each is historically formed and theoretically based. In all three, the first place is the attitude to the word, but the expression of this word is different in all three. Poets can't always interpret their poetry skillfully, actors can perform and act out the content of this poem, but they may not be able to influence the minds of the listeners and their psyche all the time. If fantasy, dream, and metaphor occupy the main place in poetry and acting, these situations are rarely used in oratory, because orators must think, not fantasize, to convey their personal thoughts to the minds of their listeners.

In order to master oratory, you need to know well its fields and types, situations of using speech. Because the style of oratory differs from each other not only by the topic and specific content of the speech, but also by the method of presentation, effectiveness, and the tools used.

With the development of social life, the demand for oratory is increasing. Being able to express one's opinion boldly, to interpret it correctly, to speak meaningfully, and to be able to speak beautifully (without extraneous elements, literally logically beautiful) is a requirement of today. In order to achieve such speech skills, it is necessary to master the "style" of oratory and its specific features. Before classifying the types of oratory (areas of application and situations), we will give a schematic table of them:

A. Applied fields of oratory (used cases)

B. Types of speech

1. Socio-political oratory

Lectures on socio-political topics,
Reports at the meeting,
political speech, parliamentary speech,
campaign speech,
speech of political activists,
political commentary,
speeches expressing the national idea.

2. Socio-household oratory

Anniversary speech
welcome speech, toast, eulogy.

3. Academic oratory

Lectures (in the auditorium), scientific lecture,
scientific information,



4. Court oratory
5. Religious oratory
6. Artistic oratory

scientific review.

Prosecutor, accuser's speech, lawyer's speech, victim's speech, etc.

Khutba, va'z, tavba, duo and others.

Poets and writers' performance skills.

From the above table, we can see that there are currently six main forms of oratorical speech, and they may have their own internal differences. When we compare this schematic table with the table in G.Z. Apresyan's book "The Art of Oratory", we can see the absence of Section VI. In our opinion, artistic speech is also a skill, it has its own characteristics. The analysis related to its interpretation is given in the next pages of the work. It is also worth noting that you can find some differences in the different versions.

In Tashkent in 1979, S. Inomkhojaev and N. Alieva developed the program "Fundamentals of Oratory". In this program, only five types of oratory are presented, and some of them are not covered. With the development of social life, the differentiation of oratorical style continues. Therefore, studying some of its undiscovered aspects is an urgent issue and demand of today.

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NOMADS IN THE LOWER SYRDARYA BASIN AND ISSUES OF THEIR RELATIONS WITH THE KHOREZM OASIS

Makhmudov Umrbek Bakhtiyorovich

Head of the Department, Urganch Innovation University

ABSTRACT

This article provides valuable information about the relations of the inhabitants of Ancient Khorezm with the nomadic tribes living in the lower Syrdarya basin. The article also substantiates that Khorezm's interaction with nomadic tribes began much earlier than the Kang period according to archaeological materials. In addition, the opinions and researches of world-renowned historians and scientists on the issue of relations between Khorezm and nomadic tribes are presented.

KEYWORDS: *nomads, Kang confederation, Kang period, Sak-massaget world, Kuyusay culture, Sarikamish delta, Khorezm Ma'mun Academy, the lower Amudarya, Charmanyap, Bazarkala, Kuzalikir, Kalalikir, Khiva, Aybugur, Khazarasp.*

It is known that the relations of the ancient Khorezm population with the nomadic tribes living in the lower Syrdarya basin is one of the least studied topics. The insufficiency of the sources makes it necessary to turn to archeological materials. The latest results of the scientists' research show that the interaction of nomadic, semi-nomadic and settled populations in the Kang confederation, located on the banks of the Syrdarya, made it possible to rise on the basis of the Kovunchi, Utrar-Koratou va Jetiasar cultures and, in turn, this factor has been proven to lead to political unification, sedentarization, and settlement [1]. It is also based on the fact that in ancient times, the development of mutual socio-economic political relations between the Kang and Kushan states led to positive changes in the living conditions of the Choch, Sughd, Dakhya and Yansay peoples (along the island) and started the crisis of nomadism. It should be said that as a result of the symbiosis of nomadic and settled cultures, a new architecture (the method of building a five-cornered and local circular arch) was created in the foothills of Syrdarya, which was also reflected in archaeological research.

Khorezm's close relations with nomadic tribes, according to archaeological materials, began much earlier than the Kang period and this issue was studied more on the basis of the archaeological monuments of Khorezm on the left bank. It should be said that the latest studies of science have emphasized the territorial location of the Khorezm people as the Turkmen-Khorasan highlands. According to this, as a result of the events of Kuchan-Mashhad and Herat, it was concluded that they were moved to the lower Amudarya basin during the Akhmenid period [2]. The Khorezmians who migrated in this way settled on the left bank of the lower Amudarya and their ancient monuments are on the left bank in Khorezm. It should not be forgotten that the geographical location of Khorezm on the left bank determined the relationship of this area with the nomadic tribes and communities living in the surrounding deserts and semi-deserts. Many scholars claim that Khorezm is a part of the

Sak-Massaget world of Central Asia and in their research, the problem of the relations of Khorezm residents with the surrounding nomadic tribes took an important place [3]. The results of the research show that the inhabitants of this area had strong cultural and political relations with the neighboring nomadic and semi-nomadic tribes in different periods of history. In particular, the archaeological monuments of pastoral tribes located directly on the borders of Khorezm can provide important information for this period. Although the issue of relations between Khorezm and nomadic tribes was raised by S.P.Tolstov, and the first studies were conducted in this regard, between 1950 and 1980, the results of the research carried out in the Uzboy, Zakaspian and Ustyurt regions, especially the burial mounds found in 1965 in the Sarikamish region of the left bank of Khorezm (Yassikir, Tuzkir, Tumek-Kichijik, Torimkoya and Shokhsanam) show that people began to occupy this land in the Neolithic period. Scientists show the entry of nomadic tribes into Khorezm in several stages. 1) VII century BC - the beginning of a new stage of land occupation during the arrival of new tribes (in the example of Kuyusay, Kuyusay 2 culture burial mounds), they are herders with cattle and horses, those who have permanent residence addresses, local crafts, i.e. bone and stone processing. Settlements are located directly on the banks of the river. 2) VI century BC - another new stage of economic occupying of Khorezm. Characteristic features of this period: emergence of irrigation facilities, the beginning of the construction of castles, frame construction being replaced by brick architecture, widespread use of the potter's wheel, The existence of farming and animal husbandry at the same status in the farm is evident in the example of the Kuzalikir and Yassikir cultures [4].

B.I.Weinberg, during the archaeological research conducted between the Tarimkoya and Kankakir hills, notes that the culture of the sedentary and semi-nomadic population in the Sarikamish delta was preserved until the IV century BC. Because many settlements were found on the banks of the



river, which had absolutely no connection with the irrigation system. This is also indicated by construction techniques and mold-based vessels reminiscent of Kuyisay culture. During the V-IV centuries BC, the nomadic population residing in the western outskirts of Khorezm actively integrated into the statehood and culture of Khorezm. Archaeologist B.I. Weinberg notes that these herding tribes founded Kanga Fortress and this fortress was undoubtedly their center [4]. Kanga Fortress is located on a hill opposite the Kanga Fortress, an ancient fortified settlement of the local population, and is connected to an active canal system of ancient riverbeds, where no irrigation facilities have been found.

As we know, the cultivated agricultural lands date back to the IV-III centuries BC and are located in narrow oases on the southern and northern sides of the Tunidarya and Davdan canals of the left bank of Khorezm. Scientists assume that the lands around Devkeskan and Kurgankala may have been occupied. In general, it is known to science that most of the Sarikamish delta is occupied by herding tribes. An example of this is the Tuzkir mound [5], where cremated bodies were buried, and it dates back to the IV-II centuries BC. As a result of archeological excavations conducted in the 60s of the last century, a large cemetery-fort with 200-250 graves was found here. The oldest date of this cemetery, where the cremated bodies were buried, is the VI-IV centuries BC [6]. In the 30 graves to its southwest, the bodies were buried in the catacombs. Scientists proved that they belong to the I-III centuries [7].

In general, in the IV century BC, the fortresses of Butentau I and II, Kanga Fortress, and Devkesken were the fortresses of the western border with nomadic tribes. There are catacombs and tombs belonging to the II-I centuries BC and the beginning of the AD century in many monuments found in the Sarikamish region. The main feature of these is that the body is buried with the head facing south (Tuzkir, Tumek-Kichijik). Similar tombs were also found in the Kalalikir I-II monument. This new catacomb tomb series is characterized by the presence of ram bones in the tomb, in addition to the general features of the burial. In addition to rituals, this situation represents the specific characteristics of the economic activity of the population group. It is worth mentioning that earthenwares, which are not characteristic of Khorezm pottery, were found in the excavations of the Tumek-Kichijik cemetery. B.I. Weinberg suggests that the Tuzkir and Tumek-Kichijik cemeteries were herders, taking into account the fact that they are located 15 km away from the agricultural oases and the ceramic finds, which are not characteristic of Khorezm pottery. The Yassikir I-II-III monuments studied by archaeologists also belong to the nomadic herding population, and they are located 5-6 km away from agricultural zones. The desert served as a boundary between the settlements of the herdsman and the farmer. In this case, it shows that the herdsman could only drive their herds through the occupied lands of Charmanyob in order to move to the winter pastures of Unguzboyi in Karakum. This, in turn, indicates a very good neighborly relationship between herdsman and farmers. Some monuments located in the left bank of Khorezm show that a

mixed population of settlers and herders lived here. An example of this is Kuyisay Fortress. Ossuary burial cemeteries and burial cemeteries of the same period were found around the castle.

By the I century AD, neighboring herding tribes established strong economic relations with oasis farmers, and they also began to become part of the Khorezm state. The absence of settlements engaged in animal husbandry and the abundance of small-horned animals in their herds indicate that this group is still unsettled and leads a nomadic lifestyle. It should be said that the resources of the Sarikamish delta were enough to feed livestock throughout the year. This, in turn, prevented migrations to the west of Sarikamish lake. Based on the presence of layers dating back to the I century AD in monuments such as Kanga Fortress, Butentau Fortress I and II, Kalajik Baba and Kurgan Fortress, they were supplied with water only from natural canals. At this time, Daryalik and Kangadarya rivers were undoubtedly flooded and flowed into Sarikamish lake. Moreover, these flooded tributaries themselves could have served as a barrier to tribal migrations beyond the basin boundaries. Recognizing that Tuzkir and Tumek-Kichijik are the wintering places of tribes engaged in animal husbandry, the maximum migration area of cattle herders did not exceed 40-50 km. Archaeologists have not found any agricultural finds here. Precisely, the strong economic relations of these times indicate that there was a division of the economy between herdsman and farmers. Because at that time pottery was widespread in the oasis south of Tuzkir (in the area of Tuzkir Fortress). Y.Y. Nerazik says that traces of pottery kilns were found in the ruins of many rural settlements inhabited by people [8]. Such a situation, that is, the emergence of pottery kilns in the border regions of the oasis, can be considered as the approach of the craftsman to the consumer. The same situation can be found in many monuments of the Kushan-Afrigian period around Charmanyob. As we mentioned above, the syncretism of the funeral rites reflects the relationship between the herdsman and the peasant population at that time. In addition, the fact that burials were carried out several times in the settlements also indicates that the movement of herding tribes became less frequent and the first elements of the settlement process. However, Weinberg remembers that local sedentary and semi-sedentary pastoral tribes lived in the Sarikamish basin in the VIII-VI centuries BC, and emphasizes that the population of this land was not ethnically homogeneous. In the IV-V centuries AD, ethnic mixing becomes more complicated. Ossuaries containing the bones and ashes of embalmed or cremated corpses, corpses buried with their heads facing south, bodies buried with their heads facing north-west and pits dug for placing pottery vessels, as well as pottery typical of Khorezm were found in Shokhsanam burial mounds of this period. The entry of the nomadic population into the territories of the left bank of Khorezm is also reflected in the materials of Kunya-Uaz, Kanga Fortress, settlements of the IV-V centuries and Torpak-kala [9].

In the Sarikamish deltas, in the V century AD, life stopped for several hundred years for unknown reasons. Not only herdsman's cemeteries, but also peasant settlements are not



found here. During this period, the archaic types that were mentioned in the sources of the settlements on the left bank of Khorezm and were preserved among the nomadic population until the last Middle Ages were widespread. The presence of such monuments in the Left Bank Khorezm is related to its economic characteristics, that is, the presence of pastoral tribes in the western region of Khorezm. In the materials of Koi Krylgan-kala and Toprak-kala, V.I.Salkin draws attention to the gradual increase in the weight of small-horned animals in the herd. This situation is explained by the specialization of animal husbandry in Khorezm and the active development of exchange between herdsmen and farmers [10]. The relationship between Khorezm's settled population and nomadic tribes is clearly visible in Sakar-chaga (Kuyusaykir) materials. Here, near the Kuyusay-kala monument, the remains of the ruined ossuary cemetery and several cemeteries where bodies were buried were found. This situation shows the mixed nature of the castle's population, which was a mixture of settled and semi-nomadic population. It is worth mentioning that the castle belongs to IV-II centuries BC and IV centuries AD. The circumstances discussed above show that the pastoral population, which settled for the first time on the left bank of the Khorezm oasis by the I century AD, established strong economic relations with the population of the neighboring agricultural micro-oases. On the other hand, it shows that they gradually entered the Khorezm state system. The lack of settlements and the predominance of small cattle in the herd among this group of nomadic pastoralists may indicate their semi-sedentary lifestyle. The natural possibilities of the right bank of Khorezm were slightly different from those of the left bank. There were no large grazing areas in the oasis, and irrigation conditions were also different. The lack of paleoanthropological materials makes it difficult to determine the ethnicity of the pastoral tribes that lived here. However, B.I.Weinberg, in connection with the specific characteristics of the Kuyusay culture, expresses the opinion that this population belongs to the Sak culture [11]. Studying 2 monuments of this culture, he draws attention to the differences between Kuyusay and Sak burial rites. And recognizing that Kuyusay people are Iranian-speaking herding tribes, he concludes that they lived in the northern borders of Iran in the VII century BC and moved to Khorezm in the middle of this century. It is worth mentioning that S.P.Tolstov, in his researches conducted in the right-bank Khorezm, noted that the carriers of the Tazabagyap culture were herdsmen and that they were directly influenced by the southern tribes. Amirabad culture is assumed to be the development of the Bronze Age when agriculture and animal husbandry combined into a productive economy. Based on the analysis of the found materials, i.e. on the basis of the increase in the number of livestock, widespread use of horses and wheeled vehicles, looking for new pastures, the increase in the desire to produce excess products and, in connection with this, exchange, availability of sources of raw materials such as copper and tin, he concludes that the development of bronze metallurgy was the factor that helped to activate internal and external relations in the Northern Desert region [12].

It is necessary to pay attention to Yakkaparsan 2 materials belonging to this culture. The existence of workshops of

craftsmen found here, to be more precise, the existence of "pottery rooms" indicates not only the emergence of skilled craftsmen, but also the formation of property and social stratification [13]. This process is more visible in the northern Tegiskan necropolises of the lower Syrdarya. Archaeologists have already found rich tombs of tribal chiefs here [14]. The large and high-quality brick architecture of the Tegiskan tombs, the presence of pottery among the grave finds, including wheel-shaped ware, and some jewelry, all confirm the penetration of elements of southern farming culture into the north.

On the other hand, the presence of potters' Andronovo ceramics type local molded pottery, Amirabad pottery, and bronze tools and ornaments next to these southern materials indicates their connection with the local desert bronze culture [15].

Many monuments of nomadic and semi-nomadic steppe tribes of Khorezm were found in the ancient delta of Syrdarya and its dry riverbeds, which are the northeastern part of Inkadarya, Janidarya and Kuvandarya. Khorezm's connections with the nomadic tribes of the lower Syrdarya are clearly visible in the ruins of Chirik Rabat, Babish Mulla, Balandi, Jetiasar, Altinasar, Uygargak, Chagirlik settlements located in these areas. The analysis of Jetiasar culture based on archaeological materials shows that Khorezm steppe tribes, especially Opasiaks, established contact during this period [16]. Already, N.L.Levina also noted that there is a similarity to the Khorezmian monuments in the construction technique and architecture of castle houses, special buildings that serve as mausoleums [17]. We can see Khorezm's relations with the settlers of the lower Syrdarya basin in the example of the Balandi monument. If we take into account that the foundations of the settlements with a defense system in the early periods of Khorezm were built of bricks and surrounded by two defensive walls (thickness 2-2.5m) and there was no corridor between the walls, Akchingul and Balandi on the borders of Khorezm were also built in this style. G.Khodjaniyozov states that he has views on the ancient monuments of Akchingul and Ketmonchi Baba, that they were a stopping place on one of the three international trade routes [18]. In addition, in the latest works of researchers [19], it is shown that Khorezm style techniques were used in the construction of the Alip-kala, Kabil-kala, Shirik 3 monuments and the fortress walls of the cities of Chirik Rabat and Babish Mulla in the lower Syrdarya. The builders who built the first defensive walls of the Balandi I fortress used Khorezm's experience in the laws of defense construction. The presence of "hidden" or "additional" gates in the fortification wall of the early period of the castle cannot be explained in any other way. The influence of the Khorezm fortification tradition is clearly visible from the bullet holes in the castle wall. The results of the research conducted by the Chirik Rabat archaeological expedition of Kazakh archaeologists in 2007-2014 confirm our opinion [20].

While periodizing the ancient history of Central Asian peoples, scientists divide it into four periods [21]. The first period is VIII-IV centuries BC – "Sak-Massaget period". Historical sources provide information about the Sak-



Massaget tribes living in Central Asia during this period. S.P.Tolstov, based on this information, in his researches emphasized that 4 large groups of Saks lived in the lower Syrdarya and placed them geographically as follows: Opasiaks (Chirik Rabat culture) lived in Janidarya basin, Tokhars (Jetiasar culture) lived in the Kuvandarya basin, the Augasiys lived between the lower Syrdarya and Kuvandarya. Inkadarya sakavarals (Tegiskan, Uygarak) lived in the south of the lower reaches of Syrdarya [22]. Contrary to this division, Litvinsky says that the saka-khaumavarka were located in the valleys of Fergana-Alay, and they lived in the lower Amudarya, including the saka-tigrakhauda and the massagets [23]. In his research, Akishev concludes that the saka-tigrakhauda occupied the territory to the south-west of Aral and the Altai Mountains. If we pay attention to the above geographical location of Khorezm according to the descriptions of Greek-Roman and Ahmani sources, we will see that it was surrounded by nomadic herding tribes. This situation naturally creates the need for them to enter into mutual economic and neighborly relations. Especially friendly relations with Tagiskan and Uygarak Sakavalars, Kuvandarya Augasiys, Jetiasar Tokhars and Chirikrabat Apasiaks of the lower Syrdarya basin are clearly visible not only in the construction style of the above-mentioned cultural monuments, but also in the order of burial and other ceremonies. Archaeologists witness the following options for burials in mounds in these settlements, especially in Chirikrabat, Janbaskala and Balandi: burnt corpses, availability of crematoriums, the body was buried in ossuaries without bones, the body is placed with its head facing south, the head of the corpse is directed to the west, the body is lying on its back with its head facing north, body with knees bent, on the head side of the corpse there are ceramic vessels, there are jewels around the body, tombs with coffins, graves plastered with reeds and twigs. All of this shows that people in these areas are engaged in a complex economy that includes cattle breeding, farming, fishing, and hunting.

Also, The discovery of traces of the Kukchadeniz culture, i.e. bronze objects or the finding of iron armor of the Scythian and Opasiak warriors in the fortresses of Chirikrabat in tombs such as Sengirtam, Babush Mulla, Tegiskan shows that there is a clash of cultures and a process of rapprochement with the surrounding tribes.

In addition, it means that a general state of religious imagination is emerging. Hundreds of archaeologists, historians, ethnographers, numismatists compete irreconcilably about the ancient history of Khorezm. The historiography of this challenge is a different issue. It should be said that S.P.Tolstov's Khorezm expedition provided us with the initial information on the history of this region. We call it "pioneer data". We will focus on the archaeological investigations conducted in these areas in recent times. The scientists of Khorezm Ma'mun Academy and Urganch State University, namely S.Baratov, Sh.Matrasulov, and K.Sobirov, along with scientists from the Karakalpakstan Department of the Academy of Sciences of Uzbekistan, Institute of History, Archeology, and Ethnography, and the University of Sydney, Australia, such as Yagodin, Helms, and Khodzhanizayov,

have conducted studies in this field. The research conducted by McLaren, Sneddon, Colin, and Betts are also extremely essential in this regard. Based on their researches, the following conclusions can be drawn.

1. Nomadic herders were active along almost the entire borders of the ancient Khorezm state. In fact, the surroundings of the oasis were favorable for the development of nomadic animal husbandry. Nomadic herders constantly moved in search of pasture for their livestock such as horses, sheep, and goats. Their houses (yurts) are adapted to constant migration. They were quick to assemble, easy to set up and easy to carry around. In ancient times, the houses of nomadic herders were built on carts. They always went with their homes. It was convenient for them to move quickly. Nomadic pastoralists occupied and settled the lands in four stages (VIII-VII centuries BC, VI-IV centuries BC, IV-IV centuries BC).
2. The western border fortresses of the left-bank Khorezm with nomadic tribes in the VI-IV centuries BC were Kanga Fortress, Butentau I and II, and undoubtedly Devkesken.
3. The relations of the right-bank Khorezm with nomadic herders can be seen in the archaeological monuments of Akchingul, Balandi, Chirikrabat, Tegiskan, and Babish Mulla on the borders of Khorezm.
4. Settled and nomadic tribes of the lower Amudarya and lower Syrdarya established peaceful neighborly and trade relations with each other in the early periods. It corresponded to the VII century BC. Archaeological objects show that the economic and cultural development of this region is equal to the advanced economies of Turanian land. In the middle of the VI century BC, several historical processes took place that led to the creation of micro-oases like Charmanyap and Bazarkala. This also led to the centralization of production, the stratification of property, the development of crafts, and the ethnic process. As a result, the military confederation of the Sak-Massaget tribes was formed, along with the development of ethnic relations.

The emergence of military confederations shows that pastoral tribes officially entered the field of history as a political force. Mutual relations between the settled and herding tribes of the lower Amudarya and Syrdarya basins developed rapidly, and sometimes sharp conflicts arose in order to expand the spheres of influence in the regions. The demand for livestock pastures has led to increased fighting between tribes. As a result, the settler-peasant population began to surround their places of residence with thick walls. During the V century BC, the oasis of Khorezm had a line of defense on its border with nomads. This line of defense was made up of large and medium-sized cities that were surrounded by defensive walls. Additionally, small rural settlements formed a defense for the internal agricultural oases along the tributaries [24]. Kuzalikir and Kalalikir served as a military border built at a height on the border with the nomads, protecting the territory of Khorezm from the attacks of the nomads from the west and south, as well as from the Ahmonites. Recent studies show that Khiva,



Aybugur, and Khazarasp fortresses were built for the purpose of protection from the southern settlers [25]. At the same time, Bozorkala was established as a military border town against the threat of nomads from the north-eastern regions. It should be noted that the complexity of a number of elements in the defense system, in addition to the urbanization processes, also shows the progress of the surrounding tribes, their unification, and the improvement of production relations. Especially, the defense structure in front of the gate, found in the fortresses, did not allow the enemy to enter the city directly.

The fact that this structure was built at a distance of 17-20 meters from the entrance gate of the fortress and the presence of one or two roundabouts reflects the complicated relations with the neighboring tribes.

The IV and II centuries BC are defined by the years of the establishment and rule of the Kang state in Central Asia. In the literature, this history is divided into the Great and Little Kang eras. The Great Kang period is the IV and II centuries BC, and archaeological and ethnological studies say that Khorezm was not part of this state. However, it was during this period (from the IV century BC) that a large number of cities and small villages were built on the right and left banks of the Amudarya, and new historical-geographical, irrigation and agricultural oases were created. Such a situation indicates the existence of a political union, the stability of the political situation, and the highly developed socio-economic and ethno-cultural relations in this region. According to historical sources, by the second half of the III century BC, Khorezm expanded its political sphere of influence in the area that reached the Caspian Sea in the south-west, the border of Ustyurt in the south-east, and the Greco-Bactrian lands in the north-east. The second Kang period corresponds to the II century BC to the II century AD. According to scientists, Khorezm was part of it for a while and quickly left [26]. The results of archaeological research also show this. Because, from the IV century BC to the II century BC, the construction of many castles and fortified villages is observed, from the II century BC to the I century AD, the renovation of the existing castles is observed, that is, during this period, no castle constructions are observed. On the contrary, the strengthening of defense walls and the increase of shooting points are observed. This process determines the attitude of the settled population to the surrounding events.

At this point, it should also be noted that during this period, a part of the Opasiak-Sakaravak tribes surrounding the Khorezm region entered the territory of Khorezm due to the large-scale military campaigns of the Scythians in the south. This is evidenced not only by the ceramics of the last Kang period, which starts from the II century BC but also by various finds excavated from the layer belonging to the last life of the Koi Krylgan-kala, spread among the steppe tribes and brought here by them. This is evidenced by the appearance of villages belonging to an earlier period and founded by the Opasiaks themselves in the southwestern edges of the Khorezm region.

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NARRATIVE POLYPHONY IN LITERARY DISCOURSE

Dilorom Sabirova

Independent Researcher, Teacher, Urgench Innovation University,

ABSTRACT

This study examines the dynamic interplay between authorial and character voices within literary texts, focusing on the linguistic representation of these voices and their amalgamation within the narrative framework. Narrative polyphony emerges from the convergence of these subject-speech spheres, offering a rich tapestry of perspectives and insights.

KEY WORDS: *polyphony, literature, narration, literary text.*

In contemporary linguistics, which gravitates towards anthropocentrism, scholarly attention towards textuality has surged, underscoring the indispensability of human agency in textual analysis. This article delves into the intricate nuances of narrative polyphony, a concept that has captivated modern linguists seeking to unravel its complexities within literary discourse.

At the present stage of development of linguistics, which has long been established in the status of anthropocentrism, the interest of scientists in the problem of text has noticeably increased, since its study cannot be imagined without taking into account the human factor. Active research into text issues gave rise in the 20th century to an entire branch of scientific knowledge - text linguistics. The text is the object of study of other linguistic disciplines: communicative grammar, syntax, linguistic and philological analysis of a literary text, stylistics, narrative linguistics, linguoculturology, etc. This article directly concerns the study of the speaking personality in the text, since at the center of our attention is paid to the problem of the linguistic embodiment of the voice of the author and character in the structure of a work of art. The combination of the subject-speech spheres of the author and characters within the literary text leads to the creation of narrative polyphony. The problem of narrative polyphony, posed in the works of foreign philologists (M.M.Bakhtin, V.V.Vinogradov), continues to be the focus of attention of modern linguists aimed at developing the concept of polyphony in literary text (M.M.Bakhtin, V.V. Vinogradov, B.A.Uspensky, S.V.Amvrosova, E.A.Ivanchikova, E.A.Popova, E.I.Shendels, M.L.Korshunova, E.A.Demina, etc.)

Narrative polyphony is a constant feature of a literary text, in which, within one fragment or even a sentence, two or more equal voices, subjective-speech ones, belonging to different intratextual subjects, are combined. Such grammatical methods of implementing polyphony in a literary text, such as *as. if, say* are intended mainly to distinguish between the speech parts of the narrator and the character. With their help, the narrator can not only convey, but also interpret someone else's speech, and

some of them even become one of the characteristic features of the writer's idiosyncrasy.

Various methods of transmitting someone else's speech have a high potential for the formation of polyphony. Indirect speech and its varieties are a polyphonic syntactic formation that has two or more speakers. Constructions with a picturesque variety of indirect speech not only contain information about the speech or mental act of the character, but also plausibly show the speech and mental activity of the hero. The voices of the author and the character are combined within the framework of indirect speech, and the pictorial elements in these constructions focus attention on the point of view of the character, to whom the author-narrator gives the right to speak. The main property of collective and indirect speech with three speakers is to combine the voices of different characters. In collective indirect speech, which is indirect speech with two speakers, the subject of the primary speech act is a multitude of persons, the subject of the secondary is the narrator. In indirect speech with three speakers, the first two are the characters (one character retells or recalls the speech of another), and the third speaker is the narrator. Indirect direct speech is characterized by the overlapping of the speech parts of the character and the narrator, resulting in the creation of a multi-layered narrative in which two voices are heard simultaneously. This allows us to identify polyphonic improperly direct discourse, which is a special type of structuring of artistic narrative, built on the complex interaction of the discourses of the author, narrator and character.

In addition to grammatical means, textual means also play a significant role in creating the polyphonic structure of a work. These include quotation nominations, intertextual elements in the speech of the author and character, which, as a rule, are at the disposal of the author-narrator. Quotational nominations represent the use by the narrator (less often by the character) of words, phrases and entire sentences from the character's direct speech. In a literary text they have their own characteristics and take on various forms. Intertextual elements fill the speech of the author or character with polyphony and semantic diversity. Fragments of other people's texts, most of which are literary in



nature, are a sign of another voice in the composition of the author's narrative.

Certain textual means, including colloquial elements in the narrator's speech, the change of primary and third-personal narrator, free indirect discourse, various forms of manifestation of the author's voice, indicate a change in the narrating subjects, which indicates a multi-vocal organization of a work of art.

In conclusion, the study of narrative polyphony is one of the methods that seek to study in more detail the anthropocentric essence of a literary text. Through polyphony, the fullness of the relationship between two personalities is revealed - the author-narrator and the character. In the hands of the author there is a living instrument - the word of the character, with the help of which he achieves his goals and objectives. This word, in turn, is intended for the reader. Thus, thanks to narrative polyphony in the text of a work of art, a close relationship between the author and the character is created, expressed in the functioning of the communicative triangle "author - character - reader".

Anthropocentrism has become the main paradigm-forming idea that currently exists in science, and the recognition of man as the dominant of scientific research has recently been observed not only in linguistics, but also in other humanities. "Anthropocentrism as a special principle of research is that scientific objects are studied, first of all, according to their role for a person, according to their purpose in his life, according to their functions in the development of the human personality and its improvement" [1]. Also, in addition to anthropocentrism, scientists include the following among the basic principles of modern language knowledge: expansionism, functionalism and explanatoryness (explanation), textocentrism and semanticocentrism. The principle of text-centrism is manifested, in particular, in the fact that the text has become the main object of linguistics. The idea expressed many years ago by M.M.Bakhtin's idea that the text is the primary given of all humanitarian and philological thinking finds its practical expression in textual studies of recent years [2]. The choice of characters in a work and the creation of their speech parts is one of the most important and at the same time difficult moments in the birth of any literary text. Consideration of its narrative structure through the prism of philological analysis of the text reveals to the reader and researcher the entire system of relationships between the author and the characters. Therefore, character voices can be detected in this system, complementing the narrator (storyteller), who takes into account their points of view, and with their interaction, the inner world of the work.

The concept of "polyphony" was first introduced by M.M. Bakhtin in the book "Problems of the poetics of F.M.Dostoevsky" [3]. It should be said that the musicological term "polyphony" was used metaphorically by M.M.Bakhtin in relation to works of art. Studying the work of F.M.Dostoevsky, M.M.Bakhtin established that "the multiplicity of independent and unmerged voices and consciousnesses, the true polyphony of full-fledged voices is indeed the main feature of Dostoevsky's novels" [3]. It should be noted that in the scientist's work the concept of polyphony was associated

primarily with the identification of a new genre - the polyphonic novel. On the basis of an objective and extremely frank disclosure of the character's personality, that phenomenon arises in the writer's works that M.M.Bakhtin called it polyphony. Now there is no longer any doubt about the correctness and accuracy of the use of this term in philological science, since the laws of organization of a musical work also apply in a literary text, in which the speech parts of the author and characters, like a musical symphony, merge into a single polyphonic whole. The multifaceted term "polyphony" finds its expression not only in literary criticism. It becomes an object of study in a variety of humanities. Concept of M.M.Bakhtin had and continues to influence the development of literary studies, linguistics, and philosophy. O.I.Valentinova considers the phenomenon of polyphony as an integral aesthetic system that has specific semiotic patterns [5]. Based on the works of F.M.Dostoevsky, the researcher studies the aesthetic essence of polyphony. The scientist's close attention turned to a detailed reconstruction of the ideal model of a polyphonic text, expressed in the form of a semantic quadrangle: the subject of the statement - the statement - the meaning of the statement - the object of the statement. However, despite the fact that most studies of literary and linguistic aspects of polyphony are not opposed and even in some moments are organically combined with each other, the linguistic essence of narrative polyphony is not always identical to the literary understanding of this phenomenon. We are primarily interested in narrative polyphony, with the help of which different voices are reflected and interact within the speech structure of a work of art. Therefore, in this research, we adhere to the following definition: Narrative polyphony is a constitutive feature of a literary text in which, within one fragment or even a sentence, two or more equal voices, subjective-speech planes, belonging to different intra-textual subjects are combined. The voice (word) of each character or author is a full-fledged consciousness in the work. In one fragment of text expressing a certain position of either the author-narrator or a character, two semantic positions belonging to different subjects of the narrative can be combined. At the same time, two embodied meanings cannot be next to each other, like two things, they must internally touch, i.e. enter into a semantic connection. This type of construction of a literary text is characteristic of both a large novel and a small story or short story, which gives the right to talk about polyphony as a "generic characteristic" of artistic literature.

Thus, the essence of the phenomenon of narrative polyphony is that in the speech structure of a work of art there is an obligatory contamination of the author's and character's speech. The duet of the voices of the author and the character can give rise to a wide variety of linguistic phenomena in the text, which are barely noticeable during a cursory reading of a work of art.

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A STUDY TO ASSESS THE EFFECT OF STRUCTURED TEACHING PROGRAM ON KNOWLEDGE REGARDING CERVICAL CANCER AMONG ANM STUDENT IN SELECTED NURSING SCHOOL (M.P.)

Shailendra Chandelkar¹

¹Assistant Professor, Psychiatric Nursing Department, Govt. Nursing College G. M. Hospital Rewa M.P.

ABSTRACT

A quasi experimental design with pre & post test without control group with experimental approach was used. A study to assess the effect of structured teaching program on knowledge regarding cervical cancer among ANM student in selected nursing school (M.P.). Reliability of the tool was tested by implementing the closed ended questionnaire on 3 ANM students studying other than the sample place. Karl men method was used to find out the reliability of the close ended questionnaire where spearman's brown correlation formula were used ($r=0.65$). Percentage wise distribution of ANM students regarding cervical cancer according to their age group depicts that highest percentage (76.67%) of them belong to the age group of 18-20 year & lowest percentage (3.34 %) of them belong to the age group 22-24 year. It reveals that highest percentage of them were 18-20 year (fig no : 4.1). show the effectiveness of structure teaching program according to pre & post test SD , mean value, there is pretest SD 7.18, Pretest mean 7.37 & post test SD 1.79, mean 24.93, combine SD 1.5 & in these study significant error is 0.27 ,DF is 29, inference of the study is significant 0.005.

Chi- square was calculated to find out the association between the post test knowledge score of ANM students. There was significant association between knowledge score of ANM students in post test when compared with age, type of family, monthly income, religion, residential area, source of information. Regarding knowledge about cervical cancer.

INTRODUCTION

Cervical cancer is a malignant tumor that develops from cells within the cervix uteri. Abnormal vaginal bleeding often serves as a prominent symptom; however, in certain instances, the cancer may advance without presenting noticeable symptoms. This disease involves the uncontrolled multiplication of cells within the cervix, leading to the destruction of healthy tissue and posing a significant threat to life. While cervical cancer is not communicable, it is rooted in genetic factors.

Cervical cancer prevention is action to lower the chance of getting cancer. by preventing cervical cancer the number of new cases of cancer in group (or) population is lowered. This will lower the number of deaths caused by cervical cancer, anything that decreases your chance of developing cancer is called a cancer protective factors.

In India cervical cancer death rate is 74,000 per year. Cervical Cancer is a leading cause of cancer death among women living in low-resource setting. In India carcinoma of the cervix is the most common malignancy in female and a major public health problem. This disease is caused by certain high-risk HPV types that can cause the cells in the lining of the cervix to change from normal to precancerous lesions. If these precancerous lesions are not diagnosed early and treated, they may turn cancerous after a few years.

The main causes of cervical cancer are HUMAN PAPPILLOMA VIRUS. The signs and symptoms of cervical cancer is vaginal

bleeding after sex, between periods or after menopause, foul smelling watery or blood vaginal discharge, pelvic pain and pain during sex. The risk factors for cervical cancer are anything that increases the chance of getting a disease. Such as smoking and sexual behavior that can lead to HUMAN PAPPILLOMA VIRUS infection. The factors include-HPV, smoking, HIV, Chlamydia, infection, diet, oral contraceptives, multiple pregnancies, low socioeconomic status, diethylstilbestrol and family history of cervical cancer.

Now-a-days cervical vaccination is available to prevent cervical cancer. GARDASIL AND CERVARIX is the first vaccine to prevent cervical cancer. Indian women face a 2.5% cumulative lifetime risk and 1.4% cumulative death risk from cervical cancer. At any given time, about 6.6% of women in the general population are estimated to harbor cervical HPV infection. HPV serotypes 16 and 18 account for nearly 76.7% of cervical cancer in India. Warts have been reported in 2-25% of sexually transmitted disease clinic attendees in India; however, there is no data on the burden of an genital warts in the general communication. By 2030, cervical cancer is expected to kill over 474,000 women per year over 95% of these deaths are expected to be in low- and middle-income countries. According to WHO about 5, 10,000 new cases of cervical cancer are detected during each year. WHO estimates that each year over 1.30 lacks Indian women are diagnosed with cervical cancer and over 74,000 die of cervical cancer. Cervical cancer can be prevented with certain food types owing to their cancer fighting properties and antioxidants,



NEED FOR THE STUDY

HPV vaccination is for primary prevention (serotype-specific with limited cross-protection) of carcinoma cervix. HPV vaccination has also been found to prevent nearly 100 percent of the precancerous cervical cell changes that would have been caused by HPV 16/18.

The data so far show duration of protection for up to 6.4 years with Cervix and for up to 5 years for Gardasil—in women who were not infected with HPV at the time of vaccination.

The **World Health Organization (WHO)** and other health institutions now advocate for the introduction of HPV vaccine as part of a national cervical cancer control strategy in countries where it is feasible and cost-effective, and where the vaccine can be delivered to adolescent girls effectively. About 500,000 new cases and 290,000 deaths occurring worldwide per annum.¹⁹ The majority of these women live in developing countries, including over 100,000 in India alone. New vaccines to prevent infection with the human Papilloma virus (HPV), the primary cause of cancer of the cervix, have the potential to protect new generations of adolescent girls.

The **American cancer society** most recently estimated that 11,270 new cases of invasive cervical cancer will be diagnosed and about 4,070 women's will die from cervical cancer in the year of 2009.

Not many know that, with a population of 365.71 million has women's aged between 15 years and above who stands at the risk of developing cervical cancer. A **world health organization** study reveals that every year 1,32,082 women are diagnosed with this particular kind of cancer and 74,118 die from the disease. The growing risk of cervical cancer in women's in India (aged 0-64) is 2.4% compared to 1.3% for the world.

In India the cervical cancer is most common cause in women. The number of cervical cancer deaths is likely to rise to 79,000 by the year of 2010.

According to WHO about 5, 10,000 new cases of cervical cancer are detected during each year. WHO estimates that each year over 1.30 lacks Indian woman's are diagnosed with cervical cancer & over 74,000 of women were died. In world approximately among 4, 93,000 cases of cervical cancer are registered newly among that in India 1,32,000 new cervical cancer cases were registered that is about 27%. Death due to cervical cancer in world 2, 73,000 among that in India 74,000. That is approximately about 27%.

According to **WHO** cervical cancer incidence & mortality rate are among 470 females mortality was 233. Cervical cancer was registered in Bangalore-21%, Barshi-22.0%, Chennai- 29.8%, Delhi-24% & Mumbai - 17.0% in the year of 2000.

In India about 2.5% of women's are risk to get cervical cancer during their life compared to the data worldwide about (1.3%).

A comparative study was conducted regarding the impact of cervical cancer vaccination (cervarix) among women 15-25 years of age in USA. Cervical cancer of both squamous and adenocarcinoma types is considered virtually 100% attributable to human papillomavirus (HPV) infection. The study result showed that HPV-16 and -18 are the predominant type worldwide accounting for over 70% of all cervical cancer. When the two studies are combined and the respective populations are evaluated, vaccine efficacy against HPV-16 and -18 related CIN2+ remains at 100%. The study concluded that the vaccine is used over time in universal prophylactic HPV-16/18 vaccination of girls and women, reductions in cervical cancers at both the individual and public health levels will be appreciated. A descriptive study was conducted to determine the prevention of cancer among women in India. The study result showed that the vaccine have been shown to confirm nearly 100% protected against cervical pre-cancer & genital warts caused by HPV types 16 & 18 in HPV population with few or no side effects. The study concluded that the Vaccination & screening which are complimentary & synergistic now constitute the new paradigm for prevention of this disease.

PROBLEM STATEMENT

A STUDY TO ASSESS THE EFFECT OF STRUCTURED TEACHING PROGRAM ON KNOWLEDGE REGARDING CERVICAL CANCER AMONG ANM STUDENT IN SELECTED NURSING SCHOOL (M.P.).

OBJECTIVE

- ❖ To assess the pre test knowledge score of the ANM student regarding cervical cancer & its prevention.
- ❖ To assess the effectiveness of structure teaching program regarding cervical cancer among ANM students.
- ❖ To compare the pre test & the post test knowledge score of the ANM students regarding cervical cancer & its prevention.
- ❖ To find out the association between pre test & the post test knowledge score of the ANM student regarding cervical cancer & its prevention with selected socio demographic variable.

HYPOTHESIS

H₀ : There will be no significant relationship between pre test and post test knowledge scores of ANM Students regarding prevention of cervical cancer.

H₁ : There will be a significant difference between pre test and post test knowledge scores of ANM Students regarding prevention of cervical cancer.

H₂ : There will be a significant association between pre test knowledge scores of ANM Students regarding prevention of cervical cancer with their selected demographic variables.

ASSUMPTIONS

- ANM students may have previous less knowledge regarding Prevention of Cervical Cancer.



- Structured teaching program may increase the knowledge level regarding prevention of Prevention of Cervical Cancer among ANM Students.
- After post test knowledge will be increased regarding Cervical Cancer among ANM Students.

LIMITATIONS

- The period of the study will be limited to 3 weeks.
- The sample size is limited to 30.
- The study is limited to ANM Students those who are studying in nursing institute.
- Willing to participate in the study.

THEORETICAL FRAMEWORK

A framework is the overall conceptual index planning of a study. Every study has a framework a theoretical rationale in a study based on a theory. The framework is refereed as the theoretical framework. (Polite D.F. and beck C.T. 2007).

Theoretical framework for this study was based on open system theory of J.W. Kenny's (1998). In these main fours is on the part and this inner relationship which make up and describe the whole. He defines system as a complex interaction which means that system consists of two or more concerted elements which from a as organized whole & which interact with each other, in the present study. The ANM students are considered as a system with the elements with various factor related to knowledge regarding cervical cancer which interacted with the ANM student in determining their knowledge.

INPUT

According to her —in put refers to mater and information. All system must receive varying type and amount of information the environment , the system uses the input to maintain its homeostasis in the present study input is considered to be the pretest which included:-

- Close ended multiple choice questionnaires regarding cervical cancer,
- Structure teaching (STP) includes-introduction regarding cervical cancer practices regarding preventive measures etc.

THROUGH PUT

According to the theory —throughput refers to are process by which the system processes input release an output of function and information. In the present study, the throughput refers to a process by which the knowledge regarding cervical cancer was tested and presentation of teaching program (STP) was done structured.

In this study the throughput refers to:-

- Pretest through the close ended multiple choice questionnaires on cervical cancer.
- Presentation of structure teaching program.
- Post test by the some pretest questionnaires.

OUTPUT

According to the theory the —output refers to matter, energy and information that have a system. The expected outcome of the study is information received from the ANM students as system. Which is assessing their knowledge regarding cervical cancer?

FEEDBACK

Feedback as per theory refers to the output that is returned to the system, which allows it to monitor if self overtime in attempt to move closer to a study state known as equilibrium. It may positive negative or neutral. In the present study the feedback is process of maintain the effectiveness of structured teaching program (STP) the formula $y-x=E$ was used (y =post test score) x =pre test score E =effectiveness of structured teaching programmed (STP) to assess the effectiveness structured teaching module regarding cervical cancer knowledge among ANM students.

The level of knowledge considers very poor, poor, average, good and very good. Further, the feedback is assessed by comparing the post test knowledge with demographic variables. The demographic variables age qualification. Type of family, income, source of information, religion, regarding cervical cancer. it conceptualized that the demographic variables may change the knowledge of ANM students .It is also considered that the feedback will be returned groom the system can be measured by comparing with the through put.

Review of literature

Review of literature is a key step in research process. It refers to an extensive exhaustive and systematic examination of publications relevant to the research project. The researcher analysis existing knowledge before developing into a new area of study while conducting a study, when interpreting results of the study, when making judgments about applications of new knowledge in nursing practice. The review of literature is defined as a broad, comprehensive in-depth, systematic and critical review of scholarly publications, unpublished scholarly print materials, audiovisual materials and personal communications.

SECTION - 1: Studies related to general information about cervical cancer.

SECTION - 2: Studies related to prevention of cervical cancer.

SECTION -3: Studies related to structured teaching programme regarding prevention of cervical cancer among students.

The methodology of research indicates the general patterns of organizing the procedure of tethering valid and reliable data for the purpose of investigation.(Kothari 2004).

The methodology of this study include research design research approach sampling technique , development of tools ,data collection procedure and method of analysis based on the statement and objective of study .

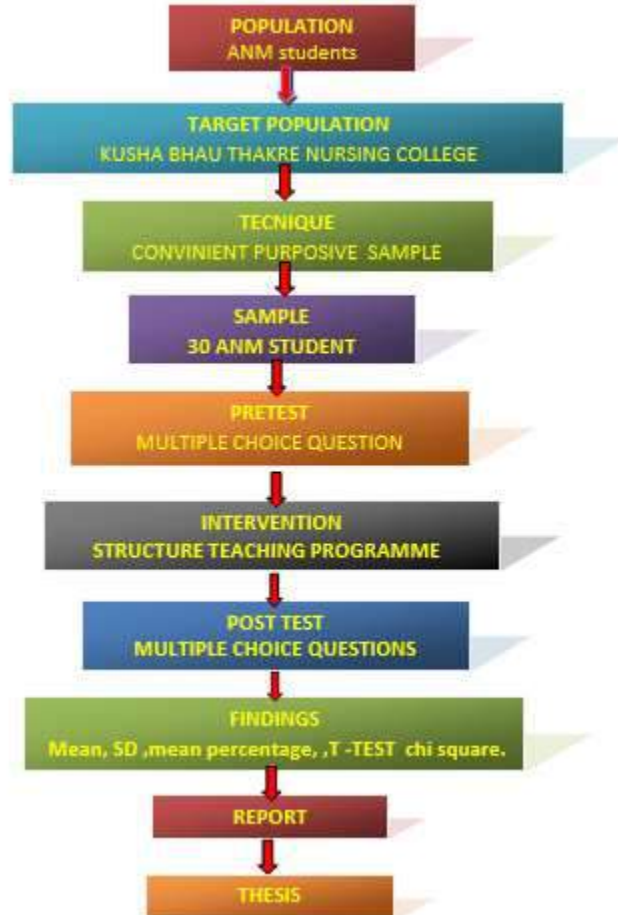
Research Design and Approach

Research design is systematic inquiry that uses disciplined methods to answer questions or solve problem. (Pilot & beak 2004)



Quasi experimental designs with pre & post test without control group with experimental approach were used

Figure no. 3.1-RESEARCH DESIGN



KEY VARIABLES

Independent variables: - Structure teaching program on cervical cancer.

Dependent variables: - Knowledge of ANM student on cervical cancer.

Extraneous variables: - Age, education status, occupation, type of family, Family income.

SETTING OF THE STUDY

The study was conducted in the Kusha Bhau Thakre nursing college Bhopal.

POPULATION

The term population includes all people as events and objects under study (kulkarni A.P.2003).

The population year the present study was 30 students of ANM in Kusha Bhau Thakre nursing college Bhopal.

SAMPLING & SAMPLING TECHNIQUES

Purposive convenient Sampling includes selecting group of people events with which to conduct a study.(kulkarni A. P. et at 2005)

SAMPLING SIZE

Sampling size was 30 ANM students in Kusha Bhau Thakre nursing college Bhopal.

SAMPLING TECHNIQUE

According to polite and hunger (1999) sampling refers to the process of selecting the population to represent the entire population. Purposive convenient sampling techniques were used to select the sample of the present study.

**CRITERIA FOR SELECTION OF SAMPLING****Inclusion criteria****ANM students who are –**

- Student of Kusha Bhau Thakre nursing college Bhopal.
- Present during the period of data collection.
- Willing to participate in the study.

DEVELOPMENTS OF THE TOOL

A close ended questionnaire was prepared based on the review literature & in consultation with the guide.

The tool consist of two section A,B.

Section A: - It consist of demographic character age, education status, religion , residential area, family income & source of information on cervical cancer.

Section B: - It consists of area pertaining to effectiveness of structure teaching program of ANM student on cervical cancer. The content of this section divided in introduction, definition, risk factor, etiology, sign & symptoms, preventive measure & management.

Table no. 3.1: Description of multiple choice questionnaires to assess the effectiveness of structured teaching program among ANM student regarding cervical cancer.

S. No.	CONTENT	No. of items
1.	Introduction & definition	5
2.	Risk factor & etiology	6
3.	Sign & symptom	6
4.	Diagnosis & complication	5
5.	Preventive measure & management	8
TOTAL ITEMS		30

SCORING: In each item there were 4 options, the correct responses carry the score one and wrong responses zero score.

Table No. 3.2 Scoring of Knowledge of ANM student regarding cervical cancer.

Knowledge Level	Actual Score	Percentage
Very poor	1-6	0-20
Poor	7-12	20-40
Average	13-18	40-60
Good	19-24	60-80
Very good	25- 30	80-100

DESCRIPTION OF STRUCTURED TEACHING PROGRAMME

First drafts of structured teaching programme were developed keeping in mind the objective, literature and opinion of experts.

Steps for preparing structured teaching programme

- 1 Referred related literature
- 2 Organization of content
- 3 Establishment of the content validity STP.
- 4 Preparation of final draft
- 5 Editing STP

Organization of the content of structure teaching programme

The structured teaching programme will be titled as —structured teaching programme on cervical cancerl, it will be organized into various sub heading:

- ❖ Introduction
- ❖ Definition
- ❖ Risk factor
- ❖ Sign & symptoms

- ❖ Prevention measure
- ❖ Complication
- ❖ Management
- ❖ Health education

VALIDITY AND RELIABILITY OF THE TOOL**Validity**

Validity is the degree to which an instrument measures what it supposed to measure (laura Talbot, 2004).

The content validity of the tools and STP were established in consultation with guide and 2 experts from gynecologist & biostatistics.

PILOT STUDY

Pilot study a small preliminary investigation of the general character as the major study, which is designed to acquaint the researcher with the problem that can be corrected a preparation for a larger research project.

After having obtained formal administrative approval, a pilot was conduct for five days from 7th February to 12th February 2014



between 10 am to 1 am at Mansarovar College of nursing Bhopal, to describe the demographic variable & knowledge regarding cervical cancer.

ANM students were selected for the pilot study & they were excluded in the actual study.

Reliability

Reliability is the degree of consistency with which it measure the target attribute (polite & beck, 2004).

Reliability of the tool was tested by implementing the closed ended questionnaire on 3 ANM students studying other than the sample place. Split half method was used to find out the reliability of the close ended questionnaire where spearman's brown correlation formula were used ($r=0.65$).

PREPARATION OF FINAL DRAFTS

Final draft of the closed ended questionnaire & structure teaching programme was prepared after testing the reliability & validity.

DATA COLLECTION PROCEDURE

Data were collected by the investigator through closed ended questionnaire.

PERMISSION FROM THE CONCERNED AUTHORITY

Prior to collection of the data, permission were obtain from the principle & consent from the participant of ANM student in Batra nursing college Bhopal.

PERIOD OF DATA COLLECTION

The expected date of data collection will be in the month of 21 April 2014.

IMPLIMENTATION OF STP

Closed ended questionnaire on assess the effectiveness of structured teaching programme among ANM student on cervical cancer. The time period was 30-45 minutes.

EVALUATION OF STP

Evaluation of STP were done by post test after 5 days of teaching of STP post test will be conducted by using the same closed ended questionnaire

Section : I

Distribution of ANM students regarding cervical cancer according to their demographic variables:

TABLE NO. 4:1: Percentage wise distribution of ANM students according to their age:-

Age In Years	Frequency	Percentage
18-20 year	23	76.6%
20-22 year	06	20%
22-24 year	01	3.34%
24-26 year	0	0.0%

Table no.4.1 depicts that highest percentage (76.67%) of them belong to the age group of 18- 20 year & lowest percentage (3.34

PLAN FOR THE DATA ANALYSIS

The collected data will be organized, tabulated & analyzed by using descriptive statistics

i.e. percentage, mean & standard deviation. The inferential statistics such as chi-square test paired t' test will be used. The paired t' test will be used to find out the differences in knowledge between pre & post test. The chi -square was used to find out the association between the demographic variables with knowledge scores. The data will be presented in the form of tables & figures.

ANALYSIS & INTERPRETATION

Kerlinger (1998) defines analysis is the categorizing, ordering, manipulating & summarizing of data to obtain to research question. The purpose of analysis is to reduce the data in to intelligence & interpretable from so that the relations of research problem can be studied & tested.

The present study is designed to assess the effectiveness of structure teaching programme (STP) regarding cervical cancer among ANM students in Kusha Bhau Thakre nursing college BHOPAL. Collected data were tabulated, organized, analyzed & interpreted using descriptive & inferential statistics.

Analysis & interpretation of data are based on the objectives of the study. The data are presented under following section:

Section: I – Percentage wise distribution of ANM students according to their demographic variables.

Section : II- pre test knowledge score of the ANM student regarding cervical cancer & its prevention.

Section: III- compare the post test knowledge score of the ANM students regarding cervical cancer & its prevention.

Section: IV- Effectiveness of structure teaching program regarding cervical cancer among ANM students.

Section: V- To find out the association between pre test & the post test knowledge score of the ANM student regarding cervical cancer & its prevention with selected socio demographic variable.

%) of them belong to the age group 22-24 year. It reveals that highest percentage of them were 18-20 year (fig no : 4.1).

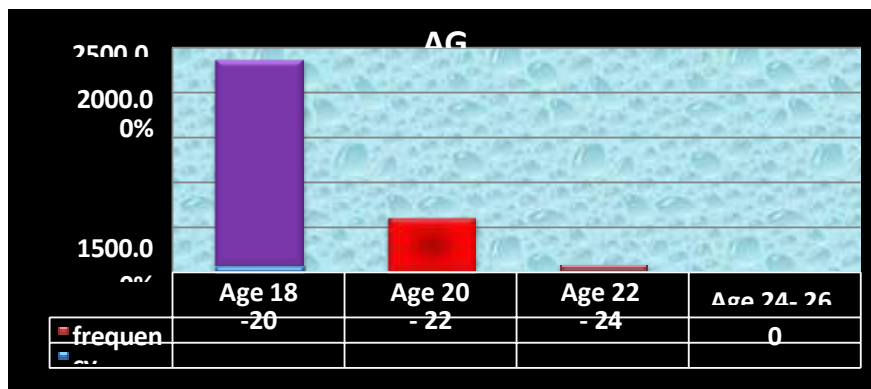


Figure no. 4:1: Bar diagram showing percentage wise distribution of ANM students according to their age.

Table. No 4:2: Percentage Wise Distribution of ANM students according to their type of Family:-

Type Of Family	Frequency	Percentage
Nuclear	18	60%
joint	12	40%

Table no. 4.2 reveals that majority (60.00 %) of them were belongs to nuclear family whereas lowest percentage (40.00 %)

of them was belonging to the joint family. It reveals that majority of them were from joint family (fig. no. 4.2).

Section: II- Table no. 4:7: Percentage distribution of pre test knowledge score of the ANM student regarding cervical cancer & its prevention.

S. No.	Mean	Standard Deviation	Coefficient Variation
Pretest knowledge	7.37	7.18	0.97

Table no. 4.7: show the mean, standard deviation & conflict variation of the pre test knowledge ANM students. There is mean

score(7.37), standard deviation is (7.18) & coefficient variation (0.97).

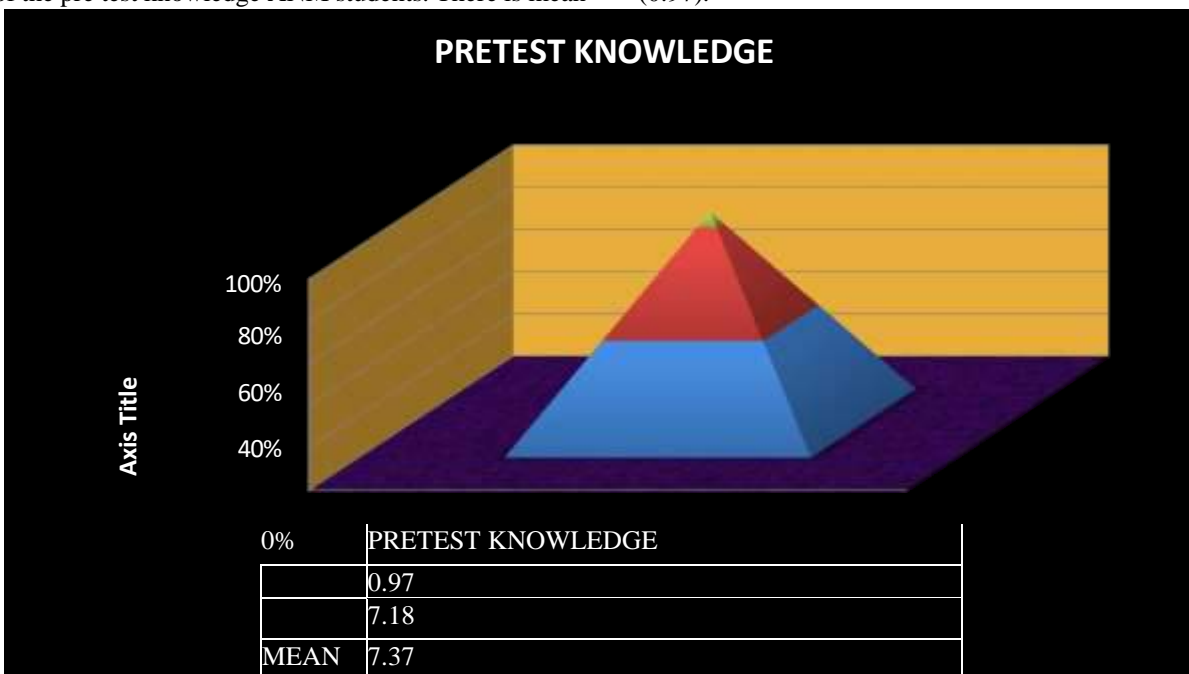




Fig. no 4:7 Column diagram show the Pretest knowledge score of ANM student regarding cervical cancer.

Section: III- Table no.4:8: Compare the post test knowledge score of the ANM students regarding cervical cancer & its prevention

S.No	Mean	Standard Deviation	Coefficient Variation
Post test knowledge	24.93	1.79	0.071

Table no. 4.8: show the mean, standard deviation & conflict variation of the pre test knowledge ANM students. There is mean score (24.93), standard deviation is (1.79) & coefficient variation (0.071).

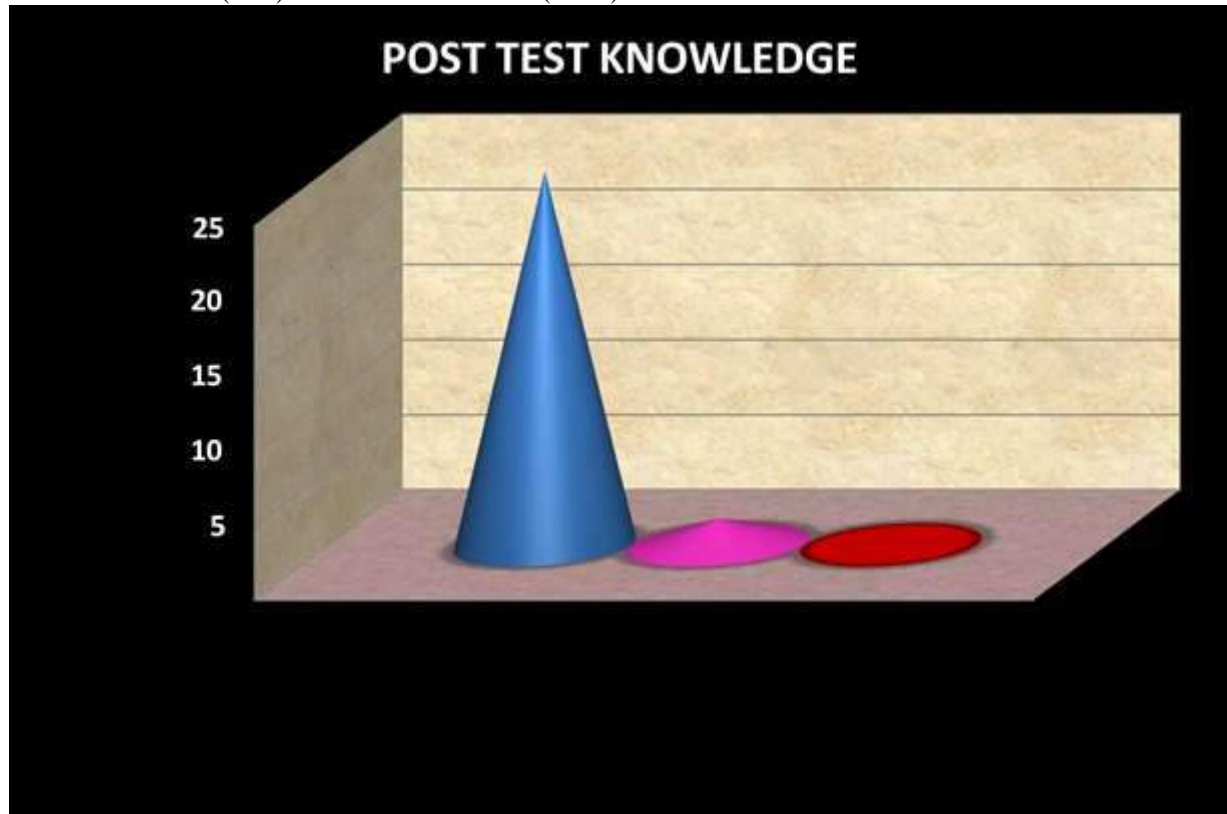


Fig. no 4:8 Column diagram show the Post test knowledge score of ANM student regarding cervical cancer.

Section: IV- Effectiveness of structure teaching program regarding cervical cancer among ANM students.

S .NO.	SD	Mean	Combine SD	SE	DF	T VALUE	P VALUE	INFERENCE
Pretest	7.18	7.37	1.5	0.27	29	3.7	0.005	Significant 0.005
Post test	1.79	24.93						

Table no. 4.9: show the effectiveness of structure teaching program according to pre & post test SD , mean value, there is pretest SD 7.18, Pretest mean 7.37 & post test SD 1.79, mean 24.93, combine SD 1.5 & in these study significant is 0.27 ,DF is 29, inference of the study is significant 0.005.

H₁ : is accepted There will be a significant difference between pre test and post test knowledge scores of ANM Students regarding prevention of cervical cancer



Table no 4.10 Association between the post test knowledge score of the ANM student regarding cervical cancer & its prevention with selected socio demographic variable.

S. N O .	Socio Demographic Data	Ve Ry Po Or	Po Or	Ave Rag E	Go Od	Ver Y Goo D	Df	Chi Square Value	Critica L Value	Inte Rfe Ren Ce
1.	AGE 18-20 YRS 20-22 YRS 22-24 YRS 24-26 YRS	- - - -	- - - -	- - - -	7 3 1 -	16 3 - -	3	3.06	0.25	N.S.
2.	TYPE OF FAMILY NUCLEAR JOINT	- -	- -	- -	8 3	10 9	1	69.78	0.005	SIG.
3.	FAMILY INCOME 2000-3000 3000-4000 4000-5000 5000-6000	- - - -	- - - -	- - - -	1 2 5 4	2 5 6 5	3	0.61	0.25	N.S.
4.	RILIGION HINDU CHRITIAN MUSLIM SIKH	- - - -	- - - -	- - - -	10 - - -	18 - 2 -	1	1.03	0.25	SIG
5.	RESIDENC E URBAN RURAL	- -	- -	- -	6 5	9 10	1	0.12	0.25	N.S.
6.	SOURCE OF INFORMAT ION MASS MEDIA PEER GROUP FAMILY MEMBER HEALTH MEMBER	- - - -	- - - -	- - - -	5 1 5 -	7 2 7 2	3	1.65	0.25	N.S.

Chi- square was calculated to find out the association between the post test knowledge score of ANM students. There was significant association between knowledge score of ANM students in post test when compared with age, type of family, monthly income, religion, residential area, source of information. Regarding knowledge about cervical cancer.

DISCUSSION, SUMMARY, CONCLUSION, IMPLICATION AND RECOMMENDATIONS
Discussion

A quasi experimental research design with pre and post test without control group and an experimental approach was conducted to —assess the effectiveness of structured teaching program regarding cervical cancer among ANM student of Kusha Bhau Thakre nursing college Bhopal. —from 06/04/2014 to 13/04/2014. The data was analyzed and the findings were presented in the form of tables and graphs in chapter IV

The chapter attempts to discuss the findings of the present study as per the objectives. The findings are discussed under the following heading:

- Percentage wise distribution of ANM students according to their demographic variables.
- Percentage wise distribution pre test knowledge score of the ANM student regarding cervical cancer & its prevention.
- Percentage wise distribution post test knowledge score of the ANM student regarding cervical cancer & its prevention.
- Effectiveness of structure teaching program regarding cervical cancer among ANM students.
- Association between post test knowledge score & demographic variables of the students related to cervical cancer.
- Demographic Characteristics of the Sample



Percentage wise distribution of ANM students regarding cervical cancer according to their age group depicts that highest percentage (76.67%) of them belong to the age group of 18-20 year & lowest percentage (3.34 %) of them belong to the age group 22-24 year. It reveals that highest percentage of them were 18-20 year (fig no : 4.1). Percentage wise distribution of ANM students regarding cervical cancer according to their type of family reveals that majority (60.00 %) of them were belongs to nuclear family whereas lowest percentage(40.00 %) of them was belonging to the joint family. It reveals that majority of them were from joint family(fig. no. 4.2).

Percentage wise distribution on ANM students regarding cervical cancer according to their family income depicts that highest percentage(36.67%) of them had family income more than 4000-5000, whereas 30% of them had family income 5000-6000, & 26.67% of them had family income 3000-4000 however, 6.67% of them had family income 2000-3000. It reveal that highest percentage had family had income 4000-5000 (fig. no. 4:3)

Percentage wise distribution on ANM students regarding cervical cancer according to their religion depicts that highest percentage (93.34%) of them were Hindu whereas, 6.67% of them were Muslim. It reveals that highest percentage were hindu.(fig.no.4:4)

Percentage wise distribution of ANM students regarding cervical cancer according to their type of residential area reveals that majority 50% of them were living in rural area where as less percentage 50% of them was belonging from urban area (fig. no. 4:5)

Percentage wise distribution of ANM students regarding cervical cancer according to their source of information that highest percentage 53.34% of them had Information from their family member were as middle one 30% of them had information by news paper and lower middle 10% of them information from peer group and lowest 6.67% of them had information from health worker (fig. no. 4:6)

Percentage distribution of pre test knowledge score of the ANM student regarding cervical cancer & its prevention. show the mean, standard deviation & conflict variation of the pre test knowledge ANM students. There is mean score(7.37), standard deviation is (7.18) & coefficient variation (0.97).

Compare the post test knowledge score of the ANM students regarding cervical cancer & its prevention. show the mean, standard deviation & conflict variation of the pre test knowledge ANM students. There is mean score(24.93), standard deviation is (1.79) & coefficient variation (0.071).

Effectiveness of structure teaching program regarding cervical cancer among ANM students. show the effectiveness of structure teaching program according to pre & post test SD , mean value, there is pretest SD 7.18, Pretest mean 7.37 & post test SD 1.79, mean 24.93,

combine SD 1.5 & in these study significant error is 0.27 ,DF is 29, inference of the study is significant 0.005.

Association between the post test knowledge score of the ANM student regarding cervical cancer & its prevention with selected socio demographic variable.

Chi- square was calculated to find out the association between the post test knowledge score of ANM students. there was significant association between knowledge score of ANM students in post test when compared with age, type of family, monthly income , religion, residential area, source of information. Regarding knowledge about cervical cancer.

SECTION –I

Pre test Knowledge score of ANM students regarding cervical cancer & its prevention.

The first objective of the study was to assess the knowledge of ANM students regarding cervical cancer.

The finding of the study revealed the mean knowledge score of ANM students regarding cervical cancer

Mean- 7.37 SD - 7.18
CV - 0.97 Mean%-3.33%

SECTION II

Compare post test Knowledge score of ANM students regarding cervical cancer & its prevention.

The second objective of the study was to assess the post test knowledge of ANM students regarding cervical cancer.

The finding of the study revealed the mean knowledge score of ANM students regarding cervical cancer

Mean- 24.93 SD - 1.79
CV - 0.071 Mean%-0.03%

SECTION III

Effectiveness of knowledge score of ANM student regarding cervical cancer after getting pre & post test marks.

Third objective of the study was to check the effectiveness of STP significant p value- 0.005.

SECTION IV

Associate demographic variable with post test knowledge score of ANM students regarding cervical cancer.

The fourth objective of the study was to find out the association between the post test knowledge score of ANM students regarding cervical cancer With selected demographic variables such as age, religion, type of family, residential area, income, source of information.

Associate demographic variables with level of knowledge were done by chi -square test. Demographic variables such as age, religion, type of family, residential area, income, source of information, were evaluated.

Chi –square was calculated to find out the association between knowledge scores of ANM students in post test when compared with age , religion, type of family, residential area, income, source of information regarding cervical



cancer.($p=0.005$). hence it can be interpreted that the difference in mean score related to the demographic variables were only by chance & not true & the null hypothesis was accepted.

SUMMARY

A quasi experimental research design with pre and post test without control group and an experimental approach was conducted to —lassess the effectiveness of STP regarding knowledge on cervical cancer among ANM students in Kusha Bhau Thakre nursing college Bhopal MP| and obtained data was analyzed by using experimental and inferential statistics presented in chapter IV.

Based on the findings of the study it can be summarized that:

- Highest 76.6% of the ANM students were in the age group of 18-20 years.
- Only 40% of the ANM students were from joint family and 60% of them were from nuclear family.
- Highest percentage 36.66% of ANM students were from the income group of 4000-5000.
- Highest 93.33% of women were Hindu, Christian and Muslim 6.66% respectively.

CONCLUSION

From the findings of the present study it can be concluded that, most of the women the age group of 18-20 years are from the joint family, from the income group of 4000, were Hindu.

IMPLICATIONS

Nursing Practice

1. Nursing profession working in hospital and community to know the knowledge of ANM students regarding cervical cancer. The findings will help the nursing professionals to plan the health education programs on cervical cancer.
2. The content of the study will help the ANM students to increase their knowledge regarding cervical cancer.

Nursing Education

This can be utilized to prepare a health education material to educate the ANM students regarding cervical cancer.

Nursing Research

1. The findings can be utilized for conducting research to assess hygiene practice duringcervical cancer.
2. Each area of knowledge can be conducted on a separate study.
3. Structure teaching program can be prepared to management of cervical cancer.

RECOMMENDATIONS

- ❖ A similar study can be under taken with a large sample to generalize the findings.
- ❖ A comparative study can be carried out to find out the knowledge regarding cervical cancer between urban and rural women.
- ❖ A study can be done to assess the knowledge regarding cervical cancer among women.
- ❖ A similar study can be done for preadolescent girls.

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AN EXAMINATION OF INDIAN LIFE INSURANCE SECTOR

Vikas Sharma

Bareilly College, Bareilly, Affiliated to MJP Rohilkhand University, Bareilly, (U.P), India.

ABSTRACT

Over the past ten years, the insurance sector in India has experienced significant expansion along with the launch of numerous cutting-edge products. This has produced a competitive environment that has produced beneficial results. India's insurance industry is vital to the country's economic health. It significantly expands people's savings options, protects their future, and aids in the formation of a sizable capital pool for the insurance industry. The insurance industry makes a significant contribution to the capital markets with the aid of these funds, which boosts major infrastructure projects in India. The life insurance market has experienced a notable surge in business due to the shift in customer perceptions of the product, as well as increased awareness and penetration. Following globalization in 1991, the Indian life insurance market has become more competitive in every way, with numerous domestic and foreign private insurance companies vying for business. This essay seeks to assess LIC of India's current standing in this fiercely competitive environment, project future trends in the company's insurance division, and assess LIC of India's potential future standing in this fiercely competitive environment.

KEY WORDS: *life insurance, Customer satisfaction, Secondary data, information, LIC, Private Life Insurer, Market share, Insurance premium.*

I . INTRODUCTION

Since 3000 BC, insurance history has been documented in one way or another. Over the ages, a number of civilizations have adopted the idea of pooling and dividing any losses incurred by certain community members among themselves. Around 1800, foreign insurance companies' agencies began offering marine insurance, marking the beginning of modern insurance in India. The Provident Fund Act and the Life Insurance Companies Act were passed in 1912 to control the insurance industry. The Insurance Act 1938 was the initial law passed in India to control the behavior of insurance businesses. On September 1st, 1956, the life insurance industry was nationalized, and the Life Insurance Corporation of India (LIC) was established. In India at the time, 170 businesses and 75 provident fund societies were involved in the life insurance industry. The LIC had the sole authority to conduct life insurance business in India from 1956 to 1999.

The Malhotra Committee was established in 1993 with the goal of investigating and suggesting modifications for the industry's advancement, including the reinstatement of a competitive element. The Insurance regulating and Development Authority (IRDA) was established in April 2000 as a statutory regulating agency for the life and non-life insurance industries as a result of the Insurance Regulatory and Development Act, 1999 (IRDA) being passed.

Life Insurance industry before Nationalization

In the year 1818, life insurance as we know it now was brought to India from England. Europeans founded Oriental Life Insurance Company in Calcutta. Indian lives were first regarded as inferior and were subject to significant additional premiums.

The first Indian life insurance business was established in 1870 with the founding of Bombay Mutual Life Assurance Society, which provided coverage for Indian lives at standard rates. Of these, Bharat Insurance Company (1896) was another company drawn to nationalism. There are now more insurance businesses as a result of the Swadeshi movement of 1905–1907. The Provident Fund Act and the Life Insurance Companies Act were passed in 1912. The requirement for actuaries to certify premium rate tables and firms' periodic appraisals was imposed by the Life Insurance firms Act of 1912. In the first two decades of the 20th century, the insurance industry experienced significant expansion. In 1938, there were 176 firms with total business-in-force of Rs. 298 crore, up from 44 companies with total business-in-force of Rs. 22.44 crore. Many financially questionable ventures were also launched during the insurance industry's explosion, but they all collapsed spectacularly.

Life Insurance industry After Nationalization

The Life Insurance Corporation Act was passed by the Indian Parliament on June 19, 1956, and the Life Insurance Corporation of India was established on September 1. At the time of nationalization, there were 154 Indian insurance companies, 16 non-Indian companies, and 75 provident operating in India. The goal was to expand life insurance significantly, especially in rural areas, in order to reach all insurable individuals in the nation and offer them sufficient financial coverage at an affordable price. Aside from its corporate office, LIC had five zonal offices, thirty-three divisional offices, and two hundred and twenty branch offices in 1956. The corporate office, 113 divisional offices, 8 zonal offices, 1381 satellite offices, and 2048 completely computerized branch offices make up the current operational



structure of LIC. The 113 divisional offices covered by LIC's Wide Area Network are connected to all of the branches via a Metro Area Network. The insurance industry was opened up following the enactment of the IRDA Act in 1999, allowing private insurance companies to participate in international partnerships and offer both general and life insurance. There are now 23 life insurance providers in operation in India.

II. OBJECTIVES

- To evaluate LIC's development and performance.
- To assess LIC of India's business trajectory going forward.

III RESEARCH METHODOLOGY

Secondary data has been used for the study.

IV. REVIEW OF LITERATURE

Kaushal and Ghosh (2018) the results of the analysis clearly show a long-term

relationship between the expansion of the banking and insurance industries and economic growth. The results of the analysis also show that there is bidirectional causality from insurance to economic growth during the post-liberalized period, whereas the demand-following relationship is continuous throughout.

Parida, Tapas Kumar and Acharya, Debashis (2016) in the study, they chart the growth of the life insurance market in India from its founding and evaluate its success over time using several business metrics. Three phases are used to evaluate the evolution and changing characteristics of the Indian insurance industry: the first spans the years 1818–1956, the second spans

the years 1956–2000 (known as the nationalization period), and the third spans the years 2000–present (post liberalization reform). Data envelopment analysis (DEA) is another tool used in the book to assess the productivity and relative efficiency of the Indian life insurance market following the reforms. Insurance companies persisted in their efforts to address the profitability issue, despite the fact that the life insurance industry's compound annual growth rate (CAGR) for total premiums during the post-reform era was 17% and the CAGR for new business premium revenue was 21%.

Nagaraja (2015) in his study tried to vindicate the relationship between the performance of insurance industry and economic development. The study showed a negative trend in the growth rate in terms of number of new policies issued and the insurance premium. Reasons and contributing factors for this state of affairs is highly essential. The document mainly deals with these aspects of the insurance industry, and compares the public and private sectors of the life and non-life insurance industries.

Arif (2015) examined the patterns and trends in the Indian life insurance market. The study included the years 2003–04–2013 as a whole. According to the report, the life insurance business had declining tendencies following privatization, but it did show increasing patterns in terms of total premiums, new policies issued, and offices opened.

V. DATA PRESENTATION AND INTERPRETATION

The data concerned with the life insurance in India is given as under and thereafter the interpretation and conclusion have been given.



Table 1: List of Life Insurers

<u>Sl.No</u>	<u>Name Of the Company</u>
1	AEGON Life Insurance Company Limited
2	Aviva Life Insurance Company India Limited
3	Bajaj Allianz Life Insurance Company Ltd
4	<u>Bharti-Axa</u> Life Insurance Company LTD
5	Birla <u>SunLife</u> Insurance Company Limited
6	<u>Canara</u> HSBC Oriental Bank of Commerce Life Insurance Company Limited
7	Edelweiss <u>Tokio</u> Life Insurance
8	Exide Life Insurance Company Limited
9	Future <u>Generali</u> India Life Insurance Company Limited
10	HDFC Standard Life Insurance Co. Ltd
11	ICICI Prudential Life Insurance Company Ltd
12	IDBI Federal Life Insurance Co Ltd
13	<u>IndiaFirst</u> Life Insurance Company Limited
14	<u>Kotak</u> Mahindra Old Mutual Life Insurance Ltd.
15	Life Insurance Corporation of India
16	Max Life Insurance Company Limited
17	PNB MetLife India Insurance Company Ltd.
18	<u>Pramerica</u> Life Insurance Limited
19	Reliance Nippon Life Insurance Company Limited
20	Sahara India Life Insurance Co. Ltd.
21	SBI Life Insurance Co. Ltd.
22	<u>Shriram</u> Life Insurance Company Ltd.
23	Star Union <u>Dai-ichi</u> Life Insurance Company Limited
24	Tata AIA Life Insurance Company LTD

Source: Handbook on Indian Insurance Statistic



Table 2: New-Business Premium of Life Insurers

(In Rs Crores)

S.No.	Insurer	2017-18	2018-19	2019-20	2020-21	2021-22
Public Sector						
1	Life Insurance Corporation of India	1,34,671.70 (8.10)	1,42,335.96 (5.69)	1,78,276.24 (25.25)	1,84,429.55 (3.45)	1,98,932.18 (7.86)
Private Sector						
2	Aditya Birla Sun Life Insurance Company Ltd.	2,662.80	3,917.07	3,657.22	4,563.68	5,664.95
3	Aegon Life Insurance Company Ltd.	147.65	117.63	91.73	61.78	16.67
4	Ageas Federal Life Insurance Company Ltd.	833.69	806.62	560.50	631.74	816.43
5	Aviva Life Insurance Company India Ltd.	325.57	283.82	217.59	220.11	292.67
6	Bajaj Allianz Life Insurance Company Ltd.	4,291.14	4,922.83	5,179.01	6,313.23	9,136.44
7	Ebaxi AXA Life Insurance Company Ltd.	730.86	911.02	828.56	782.84	935.23
8	Canara HSBC OBC Life Insurance Company Ltd.	1,227.74	1,460.49	1,527.74	2,301.25	2,795.73
9	Edelweiss Tokio Life Insurance Company Ltd.	342.46	455.88	383.13	455.43	480.45
10	Exide Life Insurance Company Ltd.*	759.90	802.20	888.88	781.05	1,002.09
11	Future Generali India Life Insurance Company Ltd.	582.35	714.94	767.50	522.88	456.97
12	HDFC Life Insurance Company Ltd.	11,349.61	14,971.45	17,238.45	20,106.63	24,154.82
13	ICICI Prudential Life Insurance Company Ltd.	9,211.75	10,364.36	12,487.52	13,226.06	15,502.24
14	IndiaFirst Life Insurance Company Ltd.	1,496.97	2,072.64	1,866.79	2,050.57	2,766.21
15	Kotak Mahindra Life Insurance Ltd.	3,404.21	3,977.11	5,105.77	5,256.51	6,142.77
16	MaxLife Insurance Company Ltd.	4,348.59	5,160.41	5,583.48	6,826.22	7,904.92
17	PNB MedLife India Insurance Company Ltd.	1,427.98	1,681.90	1,778.64	1,996.32	2,468.10
18	Pranamerica Life Insurance Company Ltd.	1,455.68	1,221.06	511.77	227.00	304.87
19	Reliance Nippon Life Insurance Company Ltd.	915.62	1,067.00	1,006.11	1,135.00	1,282.32
20	Sahara India Life Insurance Company Ltd.	4.17	0.07	0.01	0.00	0.00
21	SBI Life Insurance Company Ltd.	10,966.14	13,791.98	16,592.49	20,624.25	25,457.35
22	Shriram Life Insurance Company Ltd.	810.33	813.58	760.21	880.18	1,069.59
23	Star Union Dai-ichi Life Insurance Company Ltd.	700.72	676.51	771.02	1,163.91	1,926.31
24	TATA AIA Life Insurance Company Ltd.	1,488.42	2,476.52	3,242.01	4,143.72	5,358.50
	Private Sector Total	59,482.21 (17.51)	72,667.08 (22.17)	80,986.14 (11.45)	94,270.37 (16.40)	1,15,935.64 (22.98)
	Grand Total	1,94,153.90 (10.82)	2,15,003.04 (10.74)	2,59,262.38 (20.59)	2,78,699.92 (7.50)	3,14,867.82 (12.98)

Note: Figures in the brackets represent the growth over the previous year in percent.

Source: Handbook on Indian Insurance Statistics

Due to the country's dual demographic dynamics of a growing working population and rising disposable income, the insurance market in India is still in its early stages of development. Government programs also keep advancing the penetration and reach of insurance. With increased penetration

and the use of micro insurance to explore latent sectors, especially the rural one, the Indian insurance business is experiencing sustainable growth and momentum.


**TABLE 3: NUMBER OF INDIVIDUAL NEW POLICIES ISSUED
(LIFE)**

(In Lakhs)

Insurer	2017-18	2018-19	2019-20	2020-21	2021-22
LIC	213.38 (5.99)	214.04 (0.31)	218.96 (2.30)	209.75 (-4.21)	217.19 (3.54)
Private Sector	68.59 (8.47)	72.44 (5.61)	69.5 (-4.05)	71.52 (2.90)	73.94 (3.39)
Total	281.97 (6.58)	286.48 (1.70)	288.47 (0.69)	281.27 (-2.49)	291.13 (3.50)

Note: Figures in brackets indicates the growth (in per cent) over the previous year.

Table 4: Individual Business in Force (Within India)
(Number of Policies) (2020-21 & 2021-22)

(Policies in '000)

Particulars	LIC		All Private Players		Grand Total	
	2020-21	2021-22	2020-21	2021-22	2020-21	2021-22
Non Linked Life Business						
Business in force at start of the financial year	2,81,634	2,79,604	29,926	32,119	3,11,560	3,11,723
Additions during the year*	22,277	22,941	5,423	5,386	27,700	28,328
Deletions during the year**	24,307	28,158	3,230	3,371	27,537	31,536
Business in force at end of the financial year (A)	2,79,604	2,74,387	32,119	34,128	3,11,723	3,08,515
Non Linked -General Annuity Business						
Business in force at start of the financial year	2,044	2,292	265	362	2,309	2,654
Additions during the year*	319	255	102	159	420	414
Deletions during the year**	71	168	5	10	75	178
Business in force at end of the financial year (B)	2,292	2,379	362	511	2,654	2,890
Non Linked - Pension Business						
Business in force at start of the financial year	1,516	1,484	286	275	1,802	1,759
Additions during the year*	54	50	16	15	70	65



Deletions during the year**	85	84	27	33	112	117
Business in force at end of the financial year (C)	1,484	1,450	275	256	1,759	1,707
Non linked Health Business						
Business in force at start of the financial year	634	718	536	515	1,170	1,232
Additions during the year*	333	262	117	94	450	356
Deletions during the year**	249	269	138	126	387	394
Business in force at end of the financial year (D)	718	711	515	483	1,232	1,194
Linked Business - Life business						
Business in force at start of the financial year	1,981	1,027	11,732	11,309	13,713	12,337
Additions during the year*	108	215	1,569	1,871	1,678	2,086
Deletions during the year**	1,062	381	1,992	1,934	3,054	2,314
Business in force at end of the financial year (E)	1,027	861	11,309	11,247	12,337	12,108
Linked General annuity business						
Business in force at start of the financial year	-	-	-	-	-	-
Additions during the year*	-	-	-	-	-	-
Deletions during the year**	-	-	-	-	-	-
Business in force at end of the financial year (F)	-	-	-	-	-	-
Linked Pension Business						
Business in force at start of the financial year	1,194	938	707	788	1,902	1,726
Additions during the year*	24	0	210	224	233	224
Deletions during the year**	280	134	129	113	409	247
Business in force at end of the financial year (G)	938	804	788	900	1,726	1,704
Linked Health Business						
Business in force at start of the financial year	162	152	97	94	259	246
Additions during the year*	0	0	0	0	0	0
Deletions during the year**	10	10	4	7	13	17
Business in force at end of the financial year (H)	152	143	94	86	246	229
Non-Linked VIP-Life Business						
Business in force at start of the financial year	24	10	456	394	480	405
Additions during the year*	0	0	1	0	1	0
Deletions during the year**	14	4	63	72	77	76
Business in force at end of the financial year (I)	10	6	394	322	405	329

Source: Handbook on Indian Insurance Statistics

From unit linked investment solutions to pure term (risk) insurance, customers have an enormous array of options. Unbundled products with a range of benefits are presented to customers for selection. A growing number of consumers are selecting goods and services based on their actual needs rather

than solely conventional money-back guarantees, which are thought to be unsuitable for long-term savings and protection. The market is flooded with investing and savings plans. But several important new products, like health products have yet to be released.



VI. CONCLUSION

Furthermore, the life insurance market has grown significantly since the insurance sector underwent changes. This is because the regulations put in place have created an environment that has allowed insurance businesses to thrive in the nation. There are 23 life insurance providers in India. Life insurance accounted for a fairly large 80.2% of all insurance business, placing it 10th out of 88 countries. LIC has been effective in adding value for its clients, or policy holders. The analysis of the pre and after performances indicates a commendable expansion in the company's operations. Life insurance has a lot of promise, and LIC is still quite well-liked in our nation, no doubt. However, private companies also provide fierce competition, so LIC needs to work harder to improve its business in terms of quality, client relationships, technical advancements, and technology distribution network. Therefore, if we want to move forward toward a worry-free future, we need a well-regulated life insurance business that adapts to the needs of the times by providing its clients with specialized products to meet their financial needs.

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TEACHER EMOTIONAL SUPPORT AND PARENTAL EXPECTATION AS PREDICTORS OF STUDENTS' ATTITUDES TOWARD LEARNING MATHEMATICS

Mary Rose G. Rentuya, LPT¹, Paulino P. Tado, PhD²

¹MAED Mathematics, St. Mary's College of Tagum, Inc., Tagum City, Davao del Norte, Philippines

²Graduate Education Faculty, St. Mary's College of Tagum, Inc., Tagum City, Davao del Norte, Philippines

Article DOI: <https://doi.org/10.36713/epra16135>

DOI No: 10.36713/epra16135

ABSTRACT

This quantitative research, which employed descriptive and correlational designs, aimed to determine whether teacher emotional support and parental expectation predict students' attitudes toward learning mathematics. Using the simple random sampling technique, there were 351 Grade 7 students selected as respondents from four public secondary schools in Tagum City Division during the school year 2022-2023. This study used three adapted survey questionnaires to determine the level of teacher emotional support, parental expectation and students' attitudes toward learning mathematics. Data were treated using the Mean, Pearson-r, and multiple regression analysis. Findings suggested that teacher emotional support is always manifested, parental expectation is very evident and students' attitudes toward learning mathematics is well observed. Moreover, there is significant relationship between teacher emotional support and students' attitudes toward learning mathematics. Additionally, there is significant relationship between parental expectation and students' attitudes toward learning mathematics. Further, teacher emotional support does not significantly predict students' attitudes toward learning mathematics however, parental expectation significantly predicts students' attitudes toward learning mathematics. The study implies that factors beyond teacher emotional support and parental expectation may play a significant role in shaping students' attitudes toward learning mathematics.

KEYWORDS: mathematics education, teacher emotional support, parental expectation, attitudes toward learning, grade 7 students, descriptive and correlational research, regression analysis; Tagum City, Davao del Norte, Philippines

INTRODUCTION

Attitudes of students can either help or hinder their ability to learn and persist with difficult tasks in a given subject (DET, 2021). Thus, it is an essential aspect of learning mathematics (Astalini et al., 2019). According to Mazana et al. (2019), mathematics can be affected by students' attitudes toward learning the subject. Attitudes toward learning mathematics often reflect a student's value, self-confidence, and enjoyment when it comes to the subject (Kennedy, 2019). However, many students would think poorly of it and they tend to be more inclined to have negative attitudes toward learning mathematics (Calabrese, 2016). Nevertheless, the emotional support from teachers (Kikas & Tang, 2018) and expectations from parents (Curran & Hill, 2022) can boost students' attitudes toward learning mathematics.

In India, high school students' attitudes toward learning mathematics were found unfavourable. The majority of the students lacked confidence and felt boredom in engaging in related tasks in the subject. Some also perceived the usefulness

of mathematics in life as less important (Abhilasha & Ahmed, 2020). Additionally, Chaudhary et al. (2019), revealed that the majority of Pakistani students exhibit unfavorable attitudes toward learning mathematics because they believe it is pointless. Also, they did not find mathematics to be easy and believed that it would not benefit them in their daily lives. Furthermore, more than 50% of Fiji students feared mathematics as a subject and displayed negative attitudes toward it (Chand et al., 2021).

A study conducted by Cerbito (2020) in Quezon City, Philippines showed that high school students demonstrated negative attitudes toward learning mathematics. The study results suggested that teachers can foster positive attitudes in students towards the subject by teaching fun and engagingly. In Nueva Ecija, the study of Subia et al. (2018) revealed that the majority of the survey respondents reported being afraid of mathematics problems and quickly giving up when unable to solve them. They also indicated that they find mathematics to be the most challenging subject.

Footnote:

Rentuaya, M. R. G. & Tado, P. P. (2024). *Teacher Emotional Support and Parental Expectation as Predictors of Students' Attitudes toward Learning Mathematics*.



According to a report from the guidance office in one of the public schools in Tagum City division, 23% of students had cases involving mathematics for the school year 2021–2022. Poor attitudes and fear of mathematics are some of the contributing causes. These students participated less in submitting activities because they lacked trust in their mathematical abilities. Similarly, his research in the city of Tagum, Palma (2021) found that the poor attitudes of most students in mathematics are alarming and warrant immediate attention. These students were not driven to provide answers or participate in math classroom activities.

The researcher felt compelled to work on this issue to identify the various components that can affect how students feel about learning mathematics. The significance of teacher and parent support in shaping students' attitudes toward learning mathematics, as well as their confidence and stability in learning a difficult and intimidating subject was investigated.

OBJECTIVES

The main thrust of the research study was to determine whether teacher emotional support and parental expectation predictor of

METHODOLOGY

Research Design

This quantitative research utilized descriptive and correlational designs. The quantitative research is a method employing inquiry method that gathers numeric data through questionnaire, surveys and experiments (Coghlan & Brydon-Miller, 2014). This numerical data can be analyzed using statistical procedures (Creswell & Creswell, 2018).

Furthermore, the descriptive research design is a method uses to describe and analyse a phenomenon or variable without the involvement of manipulation or control. It focuses on gathering and analyzing data to gain insight into a particular topic, situation, or group, often through observation, surveys, or existing data analysis (Voxco, 2021).

In addition, correlational research design aims to explore the relationships between of two or more variables without manipulating either variable (Chiang, 2015). Regression analysis, which was also utilized in this study, examines the influence of one or more independent variables on a dependent variable. (Kuhn, 2020).

This study used descriptive design to describe the relationship between teacher emotional support, parental expectation, and students' attitudes toward learning mathematics of grade 7 students in Tagum City Division. Furthermore, the correlational approach was appropriate considering that this study tested the relationship between the variables and determine the influence among the indicators of the independent variables.

SAMPLING DESIGN

In choosing the respondents, simple random sampling technique was used. Simple random sampling is a sampling strategy in which each component in a population has an equal probability of being selected by using an objective selection process (Simkus, 2023). The respondents of this study were the

attitudes toward learning mathematics of grade 7 students in Tagum City Division during the SY. 2022 – 2023. Specifically, this study sought answer to the following questions:

1. What is the level of teacher emotional support in terms of positive climate, teacher sensitivity and regard for adolescent perspective?
2. What is the level of parental expectation in terms of personal maturity, academic achievement and personal relationships?
3. What is the level of students' attitudes toward learning mathematics in terms of checking solution, confidence, enjoyment, use of IT in Mathematics learning, multiple solutions and usefulness of Mathematics?
4. Is there a significant relationship between (a) teacher emotional support and students' attitudes toward learning mathematics and (b) parental expectation and students' attitudes toward learning mathematics?
5. Do teacher emotional support and parental expectation significantly predict students' attitudes toward learning mathematics?

grade 7 students enrolled in four public schools in Tagum City Division during the school year 2022–2023. The total number of students enrolled was 4001. There were 693 from school A, 1440 students from school B, 969 students from school C, and 899 students from school D. A sample size of 351 students was determined using the Raosoft calculator with a marginal error of 0.05 and a confidence level of 95%. With that sample size, 61 students from School A, 126 from School B, 85 from School C, and 79 from School D were chosen.

RESEARCH INSTRUMENT

This study collected data using three adapted instruments to assess students' perception on teacher emotional support, parental expectation, and attitudes toward learning mathematics.

Teacher Emotional Support was developed by Romano et al. (2020) and assesses three dimensions: positive climate, teacher sensitivity, and regard for adolescent perspective. Parental Expectation Survey was from Wang and Heppner's (2002) and is divided in three dimensions: personal maturity, academic achievement, and dating concerns.

Attitudes toward Learning Mathematics Questionnaire (ALM) developed by Wong and Chen (2011) and the dimensions measured are checking solution, confidence, enjoyment, use of IT in mathematics learning, multiple solutions, and usefulness of mathematics

STATISTICAL DESIGN

The results of this quantitative study were interpreted and examined using the subsequent statistical methods:

Mean. The arithmetic mean, another name for this statistical tool, was calculated by dividing the sum of all values by the total number of values. Specifically, the level of teacher emotional support, parental expectation, and students' attitudes toward learning mathematics were all evaluated using this statistical method.



Standard Deviation. This statistical tool measured how spread out the data is about the mean. Specifically, the results of this statistical method were used to determine if the scores are normally distributed or around the mean.

Pearson r. The statistical relationship, or association, between two continuous variables, were evaluated using this statistical method. In particular, this statistical method were used to assess the significance of the relationship between the teacher emotional support and students' attitudes toward learning mathematics, as well as parental expectation and students' attitudes toward learning mathematics.

Multiple Linear Regression. The link between two or more independent variables and one dependent variable was estimated using this statistical method. In particular, this statistical method determined whether teacher emotional support and parental expectations are significant predictors of students' attitudes toward learning mathematics.

RESULTS

1. Of the three indicators used to gauge the level of teacher emotional support, positive climate had the highest mean of 4.49 and standard deviation of 0.64, followed by teacher sensitivity Of 4.41 and SD of 0.60. It turned out that regard for adolescent perspective had the lowest mean of 4.33 and standard deviation of 0.66. For every indicator, the descriptive equivalent is very high. The descriptive equivalent gives teacher emotional support a very high overall mean of 4.41. This suggests that teacher emotional is always manifested.
2. Of the three indicators used to assess the level of parental expectation, personal maturity had the highest mean of 4.44, descriptive equivalent of very high and standard deviation of 0.49. Academic achievement, with a mean of 4.29 and standard deviation of 0.58, was rated second and had a very high descriptive equivalent. Personal relationship had the lowest mean, with a descriptive equivalent of high and a mean of 3.91 and standard deviation of 0.81. The overall mean of parental expectation is 4.21 which is very high. This implies that parental expectation is very evident.
3. Of the six indicators used to gauge the level of students' attitudes toward learning mathematics, usefulness of mathematics received the highest mean score of 4.15 and a standard deviation of 0.53. Checking solutions was next with a mean score of 4.06 and standard deviation of 0.55. On the third place was multiple solutions with a mean of 4.05 and standard deviation of 0.67. For the fourth place was enjoyment with a mean of 3.56 and standard deviation of 0.65. With a mean of 3.45 and standard deviation of 0.74 was IT and learning mathematics came in the fifth place. The lowest mean of 3.43 and standard

deviation of 0.84 was confidence. All indicators had a descriptive equivalent of high. The overall mean of students' attitudes toward learning mathematics is 3.78 which is high. This suggests that attitudes of students' toward learning mathematics are well observed.

4. The r – value of 0.280 shows that there is positive weak correlation between teacher emotional support and students' attitudes toward learning mathematics. The null hypothesis was rejected as the p -value of 0.000 is lesser than the significance level of 0.05. Likewise, the r – value of 0.504 shows a positive moderate correlation between parental expectation and students' attitudes toward learning mathematics. The null hypothesis was rejected as the p -value of 0.000 is lesser than the significance level of 0.05.
5. The p – value 0.000 shows that parental expectation influence students' attitudes toward learning mathematics. It was significant as the p -value of 0.000 is lesser than the significance level of 0.05 however, the p – value 1.103 shows that teacher emotional support does not influence students' attitudes toward learning mathematics. It was not significant as the p -value of 0.103 is greater than the significance level of 0.05. This implies that parental expectation influences students' attitudes toward learning mathematics however, teacher emotional support does not influence students' attitudes toward learning mathematics.

SUGGESTION

Students are encouraged to adopt a positive mind-set, practice regularly, and seek support when needed to improve their math skills. Teachers play a crucial role in understanding students' attitudes toward math and providing tailored support to motivate them. Emotional support from teachers is essential for students' well-being and academic success. Parents are urged to emphasize the relevance of math in everyday life and support their child's efforts in learning math while maintaining realistic expectations. Future researchers can use the study's findings to evaluate the effectiveness of educational interventions, with a focus on understanding the causal relationships between teacher support, parental expectations, and students' attitudes toward learning math.

CONCLUSION

Teacher emotional support is always manifested. Parental expectation is very evident. Students' attitudes toward learning mathematics is well observed. There is significant relationship between teacher emotional support and students' attitudes toward learning mathematics. Additionally, there is significant relationship between parental expectation and students' attitudes toward learning mathematics. Parental expectation influences students' attitudes toward learning mathematics however, teacher emotional support does not influence students' attitudes toward learning mathematics.

FIGURES

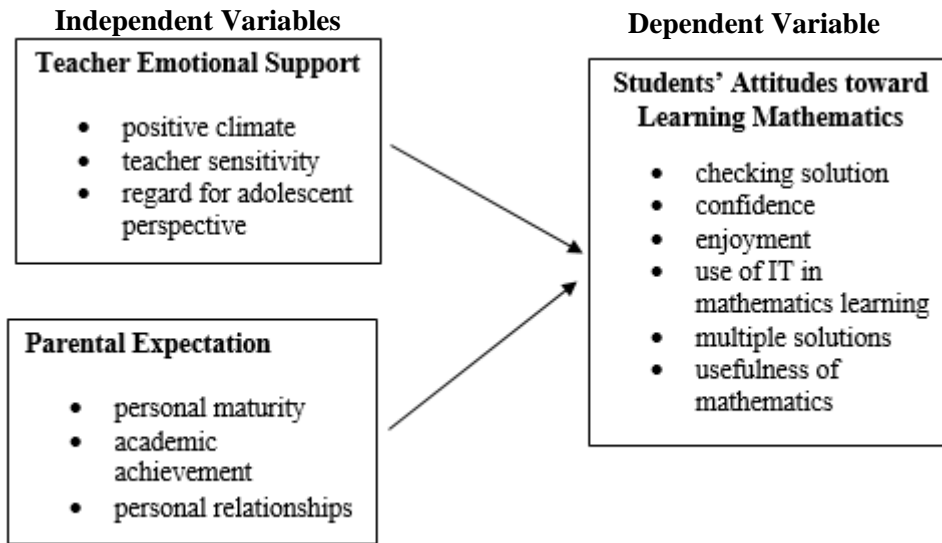
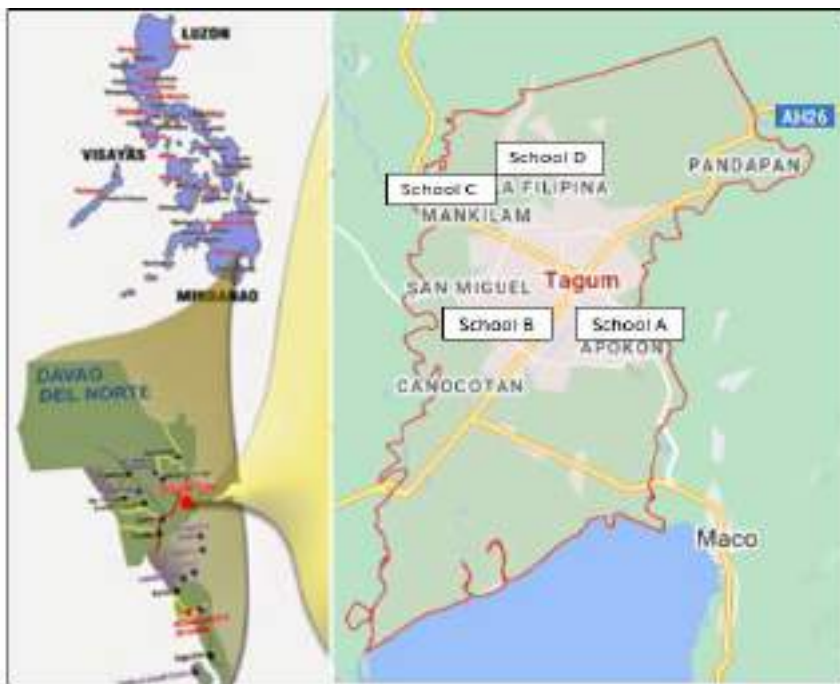


Figure 1. Conceptual Framework of the Study



Source: <https://www.google.com/maps/>

Figure 2. Map of Tagum City, Davao del Norte

TABLES

Table 1. Level of Teacher Emotional Support

Indicators	Mean	SD	Description
Positive Climate	4.49	0.64	Very High
Teacher Sensitivity	4.41	0.60	Very High
Regard for Adolescent Perspective	4.33	0.66	Very High
Category Mean	4.41	0.53	Very High



Table 2. Level of Parental Expectation

Indicators	Mean	SD	Description
Personal Maturity	4.44	0.49	Very High
Academic Achievement	4.29	0.58	Very High
Personal Relationship	3.91	0.81	High
Category Mean	4.21	0.48	Very High

Table 3. Level of Students' Attitudes toward Learning Mathematics

Indicators	Mean	SD	Description
Checking Solutions	4.06	0.55	High
Confidence	3.43	0.84	High
Enjoyment	3.56	0.65	High
IT and Learning Mathematics	3.45	0.74	High
Multiple Solutions	4.05	0.67	High
Usefulness of Mathematics	4.15	0.53	High
Category Mean	3.78	0.46	High

Table 4. Significance of the Relationship between Teacher Emotional Support and Parental Expectation for Students' Attitudes toward Learning Mathematics

Variables Correlated	r	p-value	Decision on H ₀	Decision on Relationship
Teacher Emotional Support and Students' Attitudes toward Learning Mathematics	0.280	0.000	Rejected	Significant
Parental Expectation and Students' Attitudes toward Learning Mathematics	0.504	0.000	Rejected	Significant

Table 5. Regression Analysis on the Teacher Emotional Support and Parental Expectation for Students' Attitudes toward Learning Mathematics

Independent Variable	Unstandardized β Coefficients		Standardized Coefficients		p-value	Remarks
	B	Std. Error	Beta	t		
(Constant)	1.558	0.217		7.165	0.000	
Teacher Emotional Support	0.072	0.044	0.083	1.633	0.103	Not significant
Parental Expectation	0.452	0.049	0.469	9.236	0.000	Significant

R=0.510 R square=0.260 F-value= 61.037 p=0.000

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PAGDALUMAT SA HAMONG KINAKAHARAP NG MGA GURO SA FILIPINO 7 SA KAKULANGAN SA REHIYONAL NA AKDANG PAMPANITIKAN

Fatimae S. Villarasa., LPT¹, Susan B. Dipolog, PhD²

¹ORCID No. 0009-0007-9484-486X

Teacher I, Tubaon National High School, Tubaon, Tarragona Davao Oriental, Philippines

²ORCID No. 0009-0008-9069-5956

Instructor, University of Mindanao, Tagum City, Davao del Norte Philippines

Article DOI: <https://doi.org/10.36713/epra16146>

DOI No: 10.36713/epra16146

ABSTRAK

Ang layunin ng penominolohikal na pananaliksik na ito ay tuklasin ang mga pagdalumat ng mga hamong kinakaharap ng mga guro sa Filipino 7 sa Sangay ng Dabaw Oryental tungkol sa kakulangan ng rehiyonal na akdang pampanitikan. Ito ay partikular na tutuklas sa mga hamon na kanilang kinakaharap, ang mga paraano ng pagharap na kanilang ginagamit, at ang kanilang mga pananaw kung paano tutulong ang mga guro sa ganitong uri ng suliranin. Saklaw ng pananaliksik na ito ang mga karanasan ng labing-apat (14) na mga guro sa Filipino 7 ng Sangay ng Dabaw Oryental at itutuon ang pananaliksik sa kanilang mga karanasan sa pagdalumat ng mga hamong kinakaharap ng mga guro sa Filipino 7 sa kakulangan sa rehiyonal na akdang pampanitikan. Ang mga nasuring pahayag na mula sa tugon ng mga partisipante tungkol sa naranasang mga hamon ay ang mga sumusunod na tema: kahirapan sa paghahanap ng mapagkukunan ng mga rehiyonal na akda; kahirapan sa pagtalakay at pag-unawa sa akdang pinili; ipaghina ing isariling ipagkakakilanlan; I pagkawala ing iinteres ing imga imag-aaral; iat kawalan ng katiyakan sa kawastuhan ng mga akdang nakalap. Tungkol naman sa pamamaraan nila sa pagharap ng mga nasabing hamon, lumabas ang mga sumusunod na tema: pagiging mapamaraan sa pangangalap ng rehiyonal na akda; pagkakaroon ng motibasyong makapagbigay ng tamang kaalaman; pakikipagtulungan sa kapwa guro; at pagsangguni sa mga eksperto. Tungkol naman sa kanilang mga pananaw, lumutang ang mga sumusunod na tema: kahalagahan ng positibong pananaw bilang guro; pagpapalawig sa panrehiyunal na mga akda sa panitikan; at pagpapaigting sa pananaliksik ng mga guro. Ang pag-aaral na ito ay mahalaga sapagkat naglalayong bigyan-diin ang kahalagahan ng rehiyonal na akda sa panitikan sa pagpapalalim ng kaalaman at pag-unawa ng mga guro sa Filipino. Sa pamamagitan nito, maaaring mapalawak ang saklaw ng pag-aaral sa Filipino at maipakita ang kahalagahan ng kultura at panitikang lokal sa lipunan.

MGA SUSING SALITA: guro sa Filipino 7, rehiyonal na akda, panitikan, mga mag-aaral, probinsya ng Dabaw Oryental

INTRODUKSYON

Isang malaking isyu at hamon ngayon sa mga guro at ng mga pinuno sa mga institusyong akademiko ang usapin ng pagsusulong ng isang panitikang pambansa. Kinakaharap nila ngayon ang suliranin sa pagkilala sa panitikang rehiyonal bilang pagdulog sa panitikan ng bansa hindi lamang sa salita kundi pati na rin sa aktuwal na pagbubuo ng kurikulum. Kapansin-pansin ang problema tungkol sa pagbuo ng isang kurikulum na magbigay ng pagkakataong maipasundayag ang mga akdang isinulat sa ating mga rehiyon nang sa gayon ay malaman ng mga mag-aaral ang panitikan ng kanilang bayan na lapat sa kanilang kaisipan at karanasan.

Sa Bangladesh, hamon sa mga guro ang kakulangan ng akdang pampanitikan sa pagtuturo ng kanilang wika. Naniniwala sila na ang pinakamahalagang matutunan sa

paggamit ng panitikan ay ang mga kalabuan at kawalan ng katiyakan nito na nagbibigay ng natural na pagkakataon para sa talakayan at iba't ibang interpretasyon na kabilang sa pangunahing layunin ng pagtuturo ng wika (Hassan, 2018). Dagdag pa rito, inilahad din ni Chang (2018) na sa Taiwan, maraming guro ang nakakaranas ng matinding pagkabigo at kahirapan sa pagtuturo ng wika at panitikan dahil wala silang gaanong karanasan sa pagbabasa ng mga tunay na literatura dahil sa kakulangan ng mga akdang pampanitikan. Bukod pa rito, sa Malaysia, inihayag naman ni Alam (2017) na ang bilang ng mga akdang pampanitikan ay napakaunti lamang, at ang mga akdang pampanitikan na ito ay halos hindi pa nababasa ng mga guro at mag-aaral. Dahil sa pagkakaiba sa pagitan ng mga nilalaman ng teksto at ng sistema ng pagsubok, nararamdaman ng mga mag-aaral na hindi kinakailangan na pumunta sa mga nilalamang pampanitikan.



Bukod dito, sa Pilipinas, inihayag ni Lumbera (2017), na isang malaking hamon ang mapayabong ang mga rehiyonal na akdang pampanitikan tulad ng Sebuwano, Lineyte-Samaron, Ilokano, Hiligaynon, Kapampangan, at iba pa, upang magkaroon ng unti-unting pagkabuo sa tiyak na pagkakaunawa sa kabuuan ng ating panitikan. Dulot nito ay ang kakulangan sa rehiyonal na akdang pampanitikan na gagamitin sa pagtuturo ng panitikan o ng kahit ano mang asignatura ng mga akdang minana pa natin sa ating mga ninuno o isinusulat ng mga manunulat sa ating mga rehiyon. Ito lang sana ang tanging paraan upang mas sumigla ang panitikan sa ating mga lokalidad.

Samantala, sa Lungsod ng Mati, kapuna-puna na naging malaking hamon din sa mga guro ang kakulangan ng mga akdang pampanitikan na kanilang gagamitin sa loob ng klase. Habang nagsusumikap ang mga guro na lumikha ng nakakaengganyo at may kaugnayang kultural na kurikulum, ang kawalan ng lokal na nakaugat na mga akdang pampanitikan ay humahadlang sa kanilang kakayahang kumonekta sa mga mag-aaral sa isang makabuluhang antas. Ang kakulangan nito ay hindi lamang naglilimita sa pagkakaalantad ng mga mag-aaral sa magkakaibang mga salaysay ngunit pinipigilan din ang paggalugad ng mga natatanging kultural na pananaw. Ang walang laman na ito ay humahadlang sa mga pagsisikap ng mga tagapagturo na isulong ang pagiging inklusibo at empatiya sa silid-aralan, na humahadlang sa pagbuo ng mga indibidwal na may kaalaman sa buong mundo. Ang mahigpit na pangangailangan para sa isang mas komprehensibong hanay ng mga panrehiyong panitikan ay binibigyang-diin ang pangangailangan ng pagbibigay prioridad sa paglikha at pagpapalaganap ng mga naturang materyal, pagpapayaman sa karanasang pang-edukasyon para sa mga mag-aaral sa Baitang 7 at pagpapaunlad ng isang mas magkakaugnay na lipunan.

Mayroon ng ilang mga pag-aaral na isinagawa na may kaugnayan sa kakulangan ng mga akdang pampanitikan na gagamitin sana sa pagtuturo ng wika at panitikan. Isa sa mga ito ay isinagawa nila Gabrielsen, et al. (2019) na nag-imbetiga sa kakulangan ng mga akdang pampanitikan sa pagtuturo ng mga mag-aaral sa mataas na paaralan doon sa Norway. Ang isa pa ay ang pag-aaral ni Palma at Tubo (2019) tugkol din sa kakulangan ng piling akdang panitikan na lubos na nakaapekto sa akademik perormans ng mga mag-aaral sa Filipino 7 ng Mahayag National High School, San Miguel, Bohol. Nagkaroon din ng pag-aaral na isinagawa ni Ferrer (2019) na naglahad kung paano naapektuhan ang kaalamang bokabularyo ng mga mag-aaral dahil sa kakulangan ng akdang panitikang Filipino.

Ang pag-aaral na ito ay nagpapahiwatig ng isang maigting na pakiramdam ng pangangailangan ng madaliang pagkilos dahil ito ay makakatulong sa pagbunyang ng makabuluhang obserbasyon at makabuluhang impormasyon tungkol sa

hamon ng kakulangan sa rehiyonal na akdang pampanitikan. Bukod dito, ang mga resulta ng pag-aaral na ito ay ipapalaganap sa pamamagitan ng mga aktibidad sa paaralan tulad ng *Learning Action Cells*, pagsasanay, *seminar*, *workshop*, at iba pa. Ang mga guro at mag-aaral ang pangunahing tatanggap ng mga mahalagang impormasyong ito. Sa pamamagitan nito, ang mga guro ay magkakaroon ng mga datos na nakabatay sa pananaliksik na magsisilbing kanilang batayan para sa pagbuo ng gagawin na may mga programa at aktibidad na nakatuon sa pagkamit ng mga penomena na kasangkot sa pag-aaral na ito.

Layunin ng Pag-aaral

Ang layunin ng penominolohikal na pananaliksik na ito ay tuklasin ang mga pagdalumat ng mga hamong kinakaharap ng mga guro sa Filipino 7 sa Sangay ng Dabaw Oryental tungkol sa kakulangan ng rehiyonal na akdang pampanitikan. Ito ay partikular na tutuklas sa mga hamon na kanilang kinakaharap, ang mga paraan o ang pagharap na kanilang ginagamit, at ang kanilang mga pananaw kung paano tutulungan ang mga guro sa ganitong uri ng suliranin.

Sa puntong ito ng pag-aaral, ang penomenong tinututukan ng pananaliksik na ito ay tungkol sa suliraning kinakaharap ng mga guro sa Filipino 7 sa pagtuturo ng panitikan sa mga mag-aaral. Ang penomenong ito ay tumutukoy sa labis na paghihirap na nararanasan ng mga guro sa Filipino 7 dahil sa kakulangan ng mga panrehiyonal na akdang pampanitikan. Isang malaking balakid sa pagtuturo ng panitikan kung hindi sapat ang mga akdang gagamitin sa loob ng klase. Ang penomenolohiyang ito ay makatutulong upang mapunan ang katanungang may kinalaman sa suliraning ito.

Mga Katanungan sa Pananaliksik

1. Ano-ano ang mga hamong kinakaharap ng mga guro sa Filipino 7 hinggil sa kakulangan ng rehiyonal na akdang pampanitikan?
2. Paano hinarap ng mga guro sa Filipino 7 ang mga hamong dulot ng kakulangan sa rehiyonal na akdang pampanitikan?
3. Ano ang pananaw ng mga guro sa Filipino 7 hinggil sa kakulangan ng rehiyonal na akdang pampanitikan?

METODOLOHIYA

Ang pag-aaral na ito ay gugamit ng kwalitatibong pamamaraan partikular na ang penomenolohikal na istilo. Sa pananaliksik na ito, mayroong labing-apat (14) na kalahok na mga guro sa Filipino 7 mula sa Sangay ng Dabaw Oryental ang naging bahagi ng mga ginawang panayam. Ang mga kalahok na ito ay lumahok sa mga panayam bilang pangunahing mapagkukunan ng mga datos sa pag-aaral na ito. Pitong (7) kalahok ang sumailalim sa pinalalim na panayam (IDI), habang ang pito (7) pang kalahok ay nakibahagi sa pokus na pangkatang diskusyon (FGD).



Ang mga kalahok na ito ay pinili gamit ang sumusunod na pamantayan: (1) dapat ay isang guro sa pampublikong paaralan ng Sangay ng Davao Oriental; (2) dapat ay isang guro na may posisyong Teacher I hanggang III lamang; at (3) dapat ay may karanasan sa pagtuturo ng Filipino 7 nang hindi bababa sa isang taong panuruan. Sa kabilang dako, hindi maaaring maging kalahok sa pag-aaral na ito ang mga sumusunod: (1) gurong walang karanasan sa pagtuturo ng Filipino 7, (2) mga master teacher at head teacher, (3) at mga gurong nagtatrabaho sa pampribadong paaralan. Gayundin, ang mga kalahok sa pananaliksik na ito ay binigyan ng kalayaang umatras sa paglahok anumang oras. Bilang karagdagan, ang bilang ng mga kalahok na ito ay pinili upang maabot ang hinihinging pagkakaiba-iba ng mga kalahok.

Ginamit ang *purposive sampling technique* sa pagpili ng mga magiging kalahok ng pag-aaral na ito. Sa pamamaraang ito, ang mananaliksik ay sadyang pumili ng mga partikular na indibidwal, kaso, o elemento mula sa isang populasyon batay sa kanilang mga natatanging katangian, kadalubhasaan, o kaugnayan sa mga layunin ng pananaliksik (Creswell, 2014). Ang diskarte na ito ay ginagamit kapag ang mga mananaliksik ay naglalayong mangalap ng malalim na mga *insight*, espesyal na kaalaman, o kinatawan ng mga halimbawa na umaayon sa mga layunin at saklaw ng pag-aaral. Nagbibigay-daan ang *purposive sampling* para sa isang naka-target at nakatutok na koleksyon ng data, na partikular na mahalaga sa kwalitatibong pananaliksik o kapag nag-aaral ng mga bihira o mahirap maabot na populasyon (Palinkas et al., 2015).

Sa aking pananaliksik, ang pagkuha ng mga kalahok ay isang kritikal na bahagi ng proseso. Sa aking pag-aaral ng kwalitatibong paraan, ang mga indibidwal na interbyu (IDIs) at focus group discussion (FGD) ang nagbibigay-

daan sa akin upang mas malalim na maunawaan ang aking paksa. Upang makakuha ng mga guro ng Filipino 7 mula sa iba't ibang paaralan sa napiling sangay, nagsimula ako sa pagpapadala ng mga imbitasyon sa pamamagitan ng email at pamamahagi ng mga papeles sa mga guro sa kanilang mga paaralan. Sa pamamagitan ng pagpapalaganap ng impormasyon tungkol sa aking pananaliksik at ang kahalagahan ng kanilang mga opinyon, nagawa kong mahikayat ang mga guro na maging kalahok sa aking IDIs at FGD. Sa pagsasaalang-alang ng kanilang mga pananaw, ang malinaw na pagpapakilala sa layunin ng aking pananaliksik at pagpapakita ng kung paano makakatulong ang kanilang partisipasyon ay nagbigay-lakas sa aking *recruitment process*.

MGA RESULTA

Mga Hamong Kinakaharap ng mga Guro sa Filipino 7 hinggil sa Kakulangan ng Rehiyonal na Akdang Pampanitikan

Nang maanalisa ang tugon at kasagutan ng mga partisipante sa unang katanungan tungkol sa mga hamong kinakaharap ng mga guro sa Filipino 7 hinggil sa kakulangan ng rehiyonal na akdang pampanitikan ay isa-isa nilang nailahad ang mga hamong kinaharap nila sa naturang karanasan.

Ang mga nasuring pahayag na mula sa tugon ng mga partisipante ay nakabuo ng mga sumusunod na tema: (1) paghahanap ng mapagkukunan ng mga rehiyonal na akda; (2) pag-unawa sa akdang napili; (3) paghina ng sariling pagkakakilanlan; (4) pagkawala ng interes ng mga mag-aaral; at (5) pangamba sa kawastuhan ng mga akdang nakakalap. Ang mga pangunahing ideya at mga tema tungkol sa mga naranasang hamon ay makikita sa unang talahanayan.

Talahanayan 1

Mga Pangunahing Tema at mga Ideya Tungkol sa mga Hamong Kinakaharap ng mga Guro sa Filipino 7 sa Kakulangan ng Rehiyonal na Akdang Pampanitikan

Mga Pangunahing Tema	Mga Pangunahing Ideya
	<ul style="list-style-type: none"> • Kulang sa aklat ang paaralan na maaari sanang mapagkukunan ng mga rehiyonal na akda. • Nagdudulot ng hirap ang kawalan ng mga materyales para sa mga rehiyonal na akda. • Limitado lamang ang mapagkukunan ng rehiyonal na akda. • Ang kawalan ng sapat na mapagkukunan ng kagamitan para sa rehiyonal na akda ay nagdudulot ng kalungkutan sa mga guro. • Wala masyadong mga nailimbag na mga akdang pampanitikan sa rehiyong kinabibilangan. • Nahihirapan ang mga guro na mangalap ng mga rehiyonal na akdang gagamitin sana sa araw-araw na talakayan. • Mahirap ang gawaing pagtuturo kung walang sangguniang magagamit.



Paghahanap ng Mapagkukunan ng mga Rehiyonal na Akda	<ul style="list-style-type: none"> • Nahihirapan ang mga guro sa paghahanap ng mga akdang makaka-konekta ang mga mag-aaral. • Maging ang mga mag-aaral, hindi lamang mga guro ang nahihirapang maghanap ng akdang rehiyonal. • Nababahala ang mga guro dahil wala sila mapagbabatayan ng kanilang sanggunian para sa mga rehiyonal na akda.
Pag-unawa sa Akdang Napili	<ul style="list-style-type: none"> • May pangambang nararamdaman ang mga guro na maaaring magkamali sa pag-unawa sa napiling akda. • Nahihirapan ang mga guro sa pagpapaliwanag ng mga malalawak na konsepto sa napiling akda. • Nahihirapan sa pagtalakay ng mga rehiyonal na akdang hindi naman pamilyar sa guro. • Nangangamba ang mga guro kung nagagampanan pa ba nang tama ang trabaho bilang guro gamit ang mga akdang ginamit. • Nagkakaroon ng pagkakaiba-iba ng interpretasyon ng akda dahil sa pagkakaiba rin ng pinagkunan ng akda. • Maaaring magdulot din ng pagkalito ang mga mag-aaral sa akdang ginamit dahil taliwas sa kanilang nararanasan sa rehiyon.
Paghina ng Sariling Pagkakakilanlan	<ul style="list-style-type: none"> • Nawawalan ng identidad ang rehiyon dahil sa kawalan nito ng mga akdang pampanitikan. • Ang kawalan ng sapat at buong kaalaman ng mga mag-aaral sa mga rehiyonal na akda ay maaaring magdulot ng hamon sa pagkakakilanlan. • Dahil hindi natatamo ng mga mag-aaral ang mga rehiyonal na akda, nawawalan sila ng pagkakataoon para sa pagkakakilanlan. • Maaaring mas tangkilikin ng mga mag-aaral ang akda ng ibang lahi dahil sa kawalan ng rehiyonal na mga akdang pampanitikan. • Maaaring malimutan ng mga mag-aaral ang sariling atin dahil sa kawalan ng mga rehiyonal na akdang pampanitikan.
Pagkawala ng Interes ng mga Mag-aaral	<ul style="list-style-type: none"> • Nawawalan ng interes ang mga mag-aaral kahit pa may rehiyonal na akda kung wala namang libro o modyul kaugnay dito. • Unti-unting nawawala ang interes ng mga mag-aaral sa panitikang Filipino dahil sa kakulangan ng mga rehiyonal na akda. • Maaaring malimutan agad ng mga mag-aaral ang kanilang natututuhan dahil sa kawalan ng interes sa mga akdang tinatalakay sa silid-aralan. • Nangangamba ang mga guro dahil sa kawalan ng interes ng mga mag-aaral ay hindi na nila matutunan ang kultura ng rehiyon.
Pangamba sa Kawastuhan ng mga Akdang Nakakalap	<ul style="list-style-type: none"> • Hamon sa mga guro ang pagpapatunay kung nagmumula nga ba sa kanilang rehiyon ang napiling akda. • Nawawalan ng kasiguraduhan ang mga guro sa kawastuhan ng nakukuhang mga akda dahil sa kakulangan ng learning sources. • Maaaring magkamali ang guro sa makukuhang akda dahil kung saan-saan kumakalap ng magiging sanggunian para sa mga rehiyonal na akda.

Mga Pamamaraan sa Pagharap ng mga Hamong Naranasan ng mga Guro sa Filipino 7 Dulot ng Kakulangan sa Rehiyonal na Akdang Pampanitikan

Nang maanalisa ang tugon at kasagutan ng mga partisipante sa ikalawang katanungan tungkol sa mga pamamaraang ginawa ng mga guro sa Filipino 7 sa pagharap sa mga hamong dulot ng



kakulangan sa rehiyonal na akdang pampanitikan ay isa-isa nilang inilahad ang kanilang mga estratehiya.

Ang mga nasuring pahayag na mula sa tugon ng mga partisipante ay nakabuo ng mga sumusunod na tema: (1) pagiging mapamaraan sa pangangalap ng rehiyonal na akda; (2)

pagkakaroon ng motibasyong makapagbigay ng tamang kaalaman; (3) pakikipagtulungan sa kapwa guro; at (4) pagsangguni sa mga eksperto. Ang mga pangunahing ideya at mga tema tungkol sa mga naranasang hamon ay makikita sa ikalawang talahanayan.

Talahanayan 2

Mga Pangunahing Tema at mga Ideya Tungkol sa mga Pamamaraan sa Pagharap ng mga Hamong Dulot ng Kakulangan sa Rehiyonal na Akdang Pampanitikan

Mga Pangunahing Tema	Mga Pangunahing Ideya
Pagiging Mapamaraan sa Pangangalap ng Rehiyonal na Akda	<ul style="list-style-type: none"> • Malaking tulong ang pagiging mapamaraan ng mga guro sa paghahanap ng sapat na pruwera sa nakakalap nilang akda. • Naging mapamaraan ang mga guro sa paghahanap ng mga alternatibong akda. • Naging mapamaraan ang mga guro para malampasan ang problema sa mga rehiyonal na akdang pampanitikan. • Naging mapamaraan ang mga guro sa paghahanap ng mga rehiyonal na akda sa tulong ng internet. • Ang pagpapamalas ng matalinong diskarte ay nakakatulong sa mga guro na maisagawa ang talakayan gamit ang rehiyonal na akda. • Nakatulong ang pagiging mapamaraan sa lahat ng bagay tulad ng paggamit ng internet. • Naging matiyaga ang mga guro sa paghahanap ng mga paraan upang maituro ang mga akdang nakalap. • Sa pagiging mapamaraan ng mga guro sa pagkalap ng mga rehiyonal na akda ay kinakailangan ding maging mapanuri. • Naipapamalas din ang pagiging mapamaraan sa pagiging magaling makibagay sa mga sitwasyon.
Pagkakaroon ng Motibasyong Makapagbigay ng Tamang Kaalaman	<ul style="list-style-type: none"> • Matibay ang adhikain ng mga guro ng magbigay ng tamang kaalaman upang patuloy na mabuhay ang sariling panitikan. • Motibasyon ng mga guro na mapalawak ang kaalaman ng mga mag-aaral sa kabila ng kakulangan ng mga rehiyonal na akda. • Nagiging motibasyon ng mga guro ang makitang masaya ang mga mag-aaral na natututo sa mga akdang napili. • Nagkakaroon ng motibasyon ang mga guro na mangalap ng mga rehiyonal na akda dahil sa ipinapakitang interes ng mga mag-aaral. • Motibasyon ng mga guro na magbigay ng tama at sapat na kaalaman. • Motibasyon ng mga guro na matutuhan ang pagpapahalaga ng mga mag-aaral sa sariling kultura sa tulong ng mga rehiyonal na akda. • Motibasyon ng mga guro na matutuhan ng mga mag-aaral ang pagpapayaman sa mga rehiyonal na akda. • Motibasyon ng mga guro na magampanan nang maayos ang sinumpaang tungkulin na makapagturo sa mga mag-aaral. • Hindi lang motibasyon ng mga guro ang mga mag-aaral bagkus ay nagsilbi rin silang inspirasyon sa kanilang pagtuturo.
	<ul style="list-style-type: none"> • Nagtutulungan ang mga guro upang maging epektibo sa kanilang trabaho. • Humihingi ng dagdag kaalaman ang mga guro sa kanilang mga kasamahan upang mapahasa ang kanilang pagtalakay sa akda. • Humihingi ng tulong sa kapwa guro at sa internet.



Pakikipagtulungan sa Kapwa Guro	<ul style="list-style-type: none"> • Malaking tulong sa kanila ang kapwa guro at ang internet. • Nagiging mas epektibo ang kanilang pagtuturo sa tulong ng kapwa guro. • Ang pagtatanong sa kapwa guro ay nakakatulong para mapaunlad ang pagtuturo. • Ang pagtatanong sa kapwa guro lalo na iyong mga matagal na sa propesyon ay nagbibigay sa kanila ng mga paraan na dapat gawin. • Itinuturing nilang malaking tulong ang opinion ng mga nakakatanda nilang kapwa guro. • Humihingi sila ng mga suhestiyon mula sa mga kapwa guro na may malawak na kaalaman upang mapadali ang pag-unawa sa klase ng mga akdang napili.
Pagsangguni sa mga Esperto	<ul style="list-style-type: none"> • Nakikipag-ugnayan ang mga guro sa mga eksperto na sa panitikan tulad ng mga tagapagsalita sa seminar. • Maaari ring humingi ng tulong mula sa mga eksperto ng DepEd upang mapayaman ang rehiyonal na akdang pampanitikan. • Iminumungkahi ng mga guro na gumawa ang mga eksperto sa Kagawaran ng Edukasyon ng mga plano hinggil sa problema ng kakulangan sa rehiyonal na akda. • Naging malaking tulong din ang mismong mga tagapamahala ng paaralang kinabibilangan ng mga guro sa Filipino 7. • Humihingi rin ang mga guro ng tulong sa mga guro nila sa kolehiyo na kanilang tinuturing na mga eksperto sa panitikan maliban pa sa mga nakakatandang may alam din sa panitikan. • Naniniwala ang mga guro na malaking ang malawak na kaalaman ng mga eksperto. • Ang pagsangguni sa mga dalubhasa sa Filipino ay nagbibigay ng tamang paraan kung paano maitalakay nang maayos ang aralin sa loob ng klase.

Mga Pananaw ng ng mga Guro sa Filipino 7 hinggil sa Kakulangang Rehiyonal na Akdang Pampanitikan

Nang maanalisa ang tugon at kasagutan ng mga partisipante sa ikatlong katanungan tungkol sa mga pananaw ng mga Guro sa Filipino 7 hinggil sa kakulangan ng rehiyonal na akdang pampanitikan ay isa-isa nilang inilahad ang kanilang mga ideya.

Ang mga nasuring pahayag na mula sa tugon ng mga partisipante ay nakabuo ang mga sumusunod na tema: (1) pagkakaroon ng positibong pananaw (2) pagpapalawig sa panrehiyunal na mga akda sa panitikan; at (3) pagpapagiting sa pananaliksik ng mga guro. Ang mga pangunahing ideya at mga tema tungkol sa mga naranasang hamon ay makikita sa ikatlong talahanayan.

Talahanayan 3

Mga Pangunahing Tema at mga Ideya Tungkol sa mga Pananaw ng ng mga Guro sa Filipino 7 hinggil sa Kakulangan ng Rehiyonal na Akdang Pampanitikan

Mga Pangunahing Tema	Mga Pangunahing Ideya
Pagkakaroon ng Positibong Pananaw	<ul style="list-style-type: none"> • Nakakatulong ang pagiging positibo na mayroong paraan sa lahat ng mga hamon. • Mahalagang magkaroon palagi ng pag-asa na makakahanap pa rin ang guro ng paraan upang makakalap ng mga rehiyonal na akda. • Marapat lamang na magpursigi ang mga guro sa kabila ng mga hamon ng kakulangan sa mga rehiyonal na akda. • Maging positibo sa pagtanggap ng mga suhestiyon at opinion mula sa mga mas nakakaalam. • Maging masayahin at mapagpasalamat sa kabila ng mga hamon ng kakulangan sa mga rehiyonal na akda dahil marami rin namang pananaliksik ang magbibigay ng solusyon sa suliraning ito.



	<ul style="list-style-type: none"> • Magkaroon ng positibong paniniwala na sa pagtutulongan ay masusuluyonan ang mga hamon sa kakulangan ng rehiyonal na mga akda. • Patuloy lamang sa paglaban sa mga problemang dala ng kakulangan sa mga rehiyonal na akda.
Pagpapalawig sa Panrehiyunal na mga Akda sa Panitikan	<ul style="list-style-type: none"> • Naniniwala ang mga guro na mahalagang mangolekta pa ng maraming sariling panitikan. • Iminumungkahi ng mga guro na makapagbigay pa ng karagdagang akdang pampanitikan ang Kagawaran ng Edukasyon upang mapalawig pa ang kaalaman ng mga mag-aaral tungkol dito. • Makakatulong sa pagpapalawig ng kaalaman ng mga mag-aaral tungkol sa mga rehiyonal na akda kung ang mga paaralan ay mabigyan ng sapat na mga kagamitan. • Nagnanais ang mga guro na mabigyan ng kagawaran ang mga guro sa Filipino 7 ng mga sapat na kagamitan para sa ikauunlad ng kaalaman tungkol sa rehiyonal na mga akda. • Suhestiyon ng mga guro na magkaroon ng mga seminar na tututok sa pagpapalawig ng mga rehiyonal na akda. • Isang malaking tulong sa mga guro kung ang kagawaran ay gagawa ng lehitimong sanggunian ng mga rehiyonal na akda upang ang mga ito ay mapalawig pa sa kaalaman ng mga mag-aaral.
Pagpapaigting sa Pananaliksik ng mga Guro	<ul style="list-style-type: none"> • Mahalagang manaliksik ang mismong mga guro ng mga rehiyonal na akda sapagkat sila ang mas nakakaintindi sa pangangailangan ng kanilang mga mag-aaral. • Hinanaing ng mga guro na suportahan ang mga gurong nananaliksik ng mga rehiyonal na akda. • Malaking tulong ang pagbigay ng budget sa mga mananaliksik na mga guro tungkol sa mga rehiyonal na akda.

Pangwakas na Pahayag

Matapos ang pagpapatupad ng pagsasaliksik, mahalagang magkaroon ng malalim na pagpapasya sa mga natuklasan at naging kahinatnan ng pag-aaral. Ang pagsasagawa ng pagsasaliksik sa temang Filipino ay nagdulot ng maraming kaalaman at natatanging persepsiyon sa larangan ng panitikan at edukasyon. Sa ganitong pagtatapos, nais kong ibahagi ang limang mahahalagang natuklasan at ang kanilang mga epekto sa aking pagsasaliksik.

Unang-una, matapos suriin ang mga rehiyonal na akda sa panitikan, natuklasan ko ang kahalagahan ng pagpapalawig ng kaalaman sa mga akdang ito sa ating kultura at lipunan. Ito ay nagbubukas ng mga pinto para sa mas malawakang pag-unawa at pagpapahalaga sa ating sariling panitikan.

Pangalawa, sa pamamagitan ng pag-aaral sa pagpapaigting ng pananaliksik ng mga guro sa Filipino, napagtanto ko na ang kahalagahan ng patuloy na pag-unlad at pagpapaunlad ng kanilang kakayahan sa larangan ng pananaliksik. Ito ay magbubunga ng mas malalim na kaalaman at mas mataas na kalidad ng edukasyon sa Filipino.

Pangatlo, sa pagsusuri sa positibong pananaw at pakikipagtulungan ng mga guro sa Filipino, napagtanto ko ang lakas ng pagkakaisa at pagtutulongan sa pagpapaunlad ng larangan. Ang ganitong kultura ng kooperasyon ay nagbibigay ng positibong epekto hindi lamang sa mga guro kundi sa mga mag-aaral at buong komunidad ng edukasyon.

Pang-apat, ang pananaliksik sa paghahanap ng mapagkukunan ng mga rehiyonal na akda sa panitikan ay nagdulot ng malaking papel sa pagpapaunlad ng edukasyon. Sa pagtuklas sa mga akdang ito, mas naiintindihan ng mga guro at mag-aaral ang kanilang kultura at identidad.

Panghuli, ang pag-aaral na ito ay nagdulot ng mas malalim na pag-unawa at pagpapahalaga sa kahalagahan ng Filipino sa edukasyon at lipunan. Sa kabuuan, ang mga natuklasan at kahinatnan ng pagsasaliksik na ito ay magbibigay daan sa patuloy na pag-unlad at pagpapaunlad ng larangan ng Filipino.

REKOMENDASYON

Ang mga temang lumitaw sa aking pagsasaliksik ay may malalim na implikasyon sa pagsasanay ng pagtuturo sa larangan ng Filipino. Unang-una, ang pagpapalawig sa panrehiyonal na mga



akda sa panitikan ay nagbibigay-daan sa mga guro na magkaroon ng mas malawak na kaalaman sa iba't ibang anyo ng panitikan mula sa iba't ibang rehiyon ng Pilipinas. Ito ay nagresulta sa isang mas mabigat na karanasan sa pagtuturo at mas malalim na pag-unawa sa kultura at lipunan ng mga lugar na ito.

Pangalawa, ang pagpapaigting sa pananaliksik ng mga guro ay nagbubunga ng mas makabuluhang pagtuturo. Sa pamamagitan ng pagsasagawa ng pananaliksik, ang mga guro ay nakakahanap ng mga bagong kaalaman, pamamaraan, at mga estratehiya na maaari nilang ipatupad sa kanilang pagtuturo upang mapabuti ang karanasan sa pag-aaral ng kanilang mga mag-aaral.

Pangatlo, ang pagkakaroon ng positibong pananaw ay mahalaga sa pagtuturo dahil ito ay nagtutulak ng mas matatag na ugnayan sa pagitan ng guro at mag-aaral. Sa pamamagitan ng pagtuturo na may positibong pananaw, ang mga guro ay nagiging mas mapanuri, mapagpasensya, at maasikaso sa kanilang mga mag-aaral, na nagbubunga ng mas mataas na tagumpay sa pag-aaral.

Pang-apat, ang pagpapahalaga sa pakikipagtulungan sa kapwa guro ay nagpapalakas ng kolektibong pagtuturo. Sa pamamagitan ng pagbabahagi ng karanasan, kaalaman, at mga pamamaraan sa pagtuturo, ang mga guro ay nagkakaroon ng mas malawak na perspektibo at mas magkakaroon ng kakayahan na tugunan ang iba't ibang pangangailangan ng kanilang mga mag-aaral.

Panghuli, ang pagkakaroon ng kasanayan sa pagsangguni sa mga eksperto ay nagpapalakas sa propesyon ng mga guro. Sa pamamagitan ng pagtanggap ng payo at suporta mula sa mga eksperto sa larangan ng edukasyon at panitikan, ang mga guro ay nagiging mas epektibo sa kanilang pagtuturo at mas handa sa pagharap sa mga hamon ng pagtuturo sa Filipino.

Mga Rekomendasyon Para sa Higit pa na Pananaliksik

Para sa mga susunod na mananaliksik, mahalaga na magkaroon ng panibagong pagtingin sa mga lumutang na mga tema na nabunyag sa aking pagsasaliksik. Narito ang ilang mga rekomendasyon para sa kanila:

Unang-una, maaaring pagtuunan ng pansin ng mga susunod na mananaliksik ang pagsasagawa ng mas malalim na pag-aaral sa mga rehiyonal na akda sa panitikan. Maaring suriin ang iba't ibang genre at estilo ng panitikan mula sa iba't ibang rehiyon upang masuri ang kanilang impluwensya at kahalagahan sa kultura at lipunan.

Pangalawa, mahalaga rin na maisagawa ang mga pananaliksik na tumutok sa pagpapaigting ng pananaliksik ng mga guro sa

Filipino. Maaaring isagawa ang mga pagsasanay at workshop upang maging mas handa at produktibo ang mga guro sa kanilang mga pagsasaliksik. Dagdag pa rito, maaari ring bigyan ng suporta at insentibo ang mga guro upang maging mas aktibo sila sa pag-aaral.

Higit pa, maaaring magkaroon ng mga pag-aaral na naglalayong palakasin ang positibong pananaw at pakikipagtulungan ng mga guro sa Filipino. Maaring ito'y isagawa sa pamamagitan ng pag-organisa ng mga grupong naglalayong magbahagi ng kaalaman at karanasan sa pananaliksik. Sa ganitong paraan, maaaring mabigyan ng inspirasyon at suporta ang iba pang mga guro na magsagawa rin ng kanilang mga pananaliksik sa larangan ng Filipino.

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ABOUT THE AUTHOR



FATIMAE S. VILLARASA, LPT. *nagtapos ng Bachelor of Education major in Filipino sa Davao Oriental State University noong June 2019. Kumuha siya ng kanyang master's degree sa St. Mary's College of Tagum Incorporated taong 2022-2023. Siya ang nagsimulang magturo noong September 2021 bilang DEPED teacher.*



SUSAN B. DIPOLOG, PhD, *nagtapos ng Doktor ng Piliopsiya sa Filipino sa Universidad ng Mindanao, Davao City. May-akda ng "Pagsulat sa Piling Larangan" at "Komunikasyon at Pananaliksik sa Wika at Kulturang Pilipino. Nagtuturo sa loob ng 15 taon sa UM Tagum College.*



A REVIEW ON: ROLE OF ORGANIC FARMING FOR SUSTAINABLE AGRICULTURE PRODUCTION

Vikhe A.S¹. Gadekar C.S² Chechare C.V³ Ajabe P.G⁴

¹Asst. Prof. Department of Chemistry, Padmashri Vikhe Patil college of Arts, Science and Commerce, Pravaranagar.
^{2,3,4}M.Sc Students, Department of Chemistry, Padmashri Vikhe Patil college of Arts, Science and Commerce, Pravaranagar.

ABSTRACT

Agriculture is said to be the backbone of Indian economy. 65 percentages people are directly and indirectly involved in this agricultural business. It is because of this agriculture that the progress of many businesses such as secondary and tertiary of any country depends on this primary business. Hence primary business is considered as the soul of any business. Along with the growing population of the entire world, chemical fertilizers and seeds are being used in large quantities in modern times to increase agricultural production. However, on the one hand, we can see the harmful effects of large quantities of chemicals and drugs on health and the environment. Although the ecosystem, environment and human health are in danger due to these chemical factors, organic agriculture has a lot of scope for development. So doing organic farming is the need of the nowadays.

KEY WORDS: Environment, Organic Farming, Sustainability, Chemicals, Bio-fertilizers

INTRODUCTION

Organic farming is the need of modern times. Because of we get to see degradation of agricultural production, soil quality, environment quality and human health due to chemical factors. Organic farming should be used as an alternative to conventional farming methods. In this organic farming, instead of chemical fertilizers and pesticides, fertilizers prepared from biological and natural ingredients are used. In this method mainly mulch, fertilizers prepared from various insects, animal-bird droppings or cow dung are mainly used. Due to this, pollution of the environment is prevented, crops grow properly, soil fertility is preserved, the ecosystem of micro-organisms in the soil is preserved, food is supplied to humans in a good form, and pollution is reduced. Such various factors have a positive effect on the environment, human health and various elements of nature. Sustainable agriculture is farming in such a way to protect the environment, aid and expand natural resources and to make the best use of non-renewable resources. The goal of sustainable agriculture is to meet society's food and textile needs in the present without compromising the ability of future generations to meet their own needs.

METHODOLOGY

The main objective of this research is to study the literature review related to organic farming. Mainly secondary data has been used for this research paper. The said data is taken from various websites, government office websites, research articles and online information.

LITERATURE REVIEW

Rajesh Kumar (2022) Organic farming is native to India. The farmers of ancient India are known to have evolved nature friendly farming systems and practices such as mixed farming, mixed cropping, and crop rotation. The first "scientific" approach to organic farming can be quoted back to the Vedas

of the "Later Vedic Period", 1000 BC to 600 BC. The essence is to live in partnership with, rather than exploit, nature. In this regard, the "Vrikshayurveda" (Science of plants), the "Krishisastra" (Science of agriculture) and the "Mrugayurveda" (Animal Science) are the main works.

The Green Revolution has resulted in significant advancements in agricultural technology and policy in order to increase food production in order to meet the demands of an ever-increasing global population. Although food availability and production have expanded as a result of the usage of chemical fertilizers, herbicides, insecticides and pesticides, consumers have become more quality conscious in recent years and are increasingly demanding ecologically safe, chemical-free healthful foods (Chander *et al.*, 2011).

Organic farming maintains the health of the soil, while maintaining the quality of the water. Because due to the use of chemical fertilizers, the chemical fertilizers dissolve with water and seep into the soil, which again goes to wells, sub-channels, rivers and drains. Such forms also lead to water pollution and soil quality deteriorates to a great extent⁽¹⁾.

Although the agricultural production is increasing due to the use of chemical fertilizers and seeds, it has an adverse effect on the water on the land. In short, water quality is not maintained due to the use of chemical agents, which has a negative impact on human health⁽²⁾.

Soils rich in organic matter are easy to till, have good texture, seed set well and plants grow vigorously. Due to the slow availability of nutrients in organic matter, they are continuously available during the growth period of crops and the growth of crops is better. Maintaining such lands is beneficial to the farmers. Fertilizing the crops improves the growth characteristics of the crops and the growth of roots and stems in



the soil. Crops need to be fertilized as the organic matter in the soil is left behind after the crops grow⁽³⁾.

The biological and chemical elements present in the soil do not disturb the natural cycle. Instead, if chemical agents are used, the biological process can be terminated. But with the use of organic fertilizers, this cycle can be continued continuously, thereby maintaining soil fertility and improving agricultural yields⁽⁴⁾.

Sustainable agriculture is farming in such a way to protect the environment, aid and expand natural resources and to make the best use of non-renewable resources⁽⁵⁾.

The problem of salinity land is becoming more serious day by day. Re-cultivation of such land may not be possible; the main reason for this is the use of chemical fertilizers used in the soil⁽⁶⁾.

Soil is a thin layer of the earth's crust that supports plants and provides nutrients. Soil is a mixture of fine rock particles and humus. Although soil is considered an inanimate object, it serves a variety of living things, from small bugs and insects to reptiles. Plant life depends on soil and animal life depends on plants. A healthy environment requires healthy soil⁽²⁾.

The type of soil depends on the rock from which the soil is formed and the type of plants that grow on it. Soil is mainly made up of four components first is Minerals (45%), second is Organic matter (5%), third is Water (25%) and last four is Air (25%)⁽⁵⁾.

Even though organic farming results in shortfalls in production, it is environmentally sound sustainable agriculture. This reduces the pollution in short the soil quality is maintained⁽⁷⁾.

Humans are responsible for the deterioration of the quality of various elements in the environment. Because of technology is the link between human resources and natural resources. The economic development of human beings with their intellectual skills and technology, human beings are continuously degrading the environment. From this point of view, sustainable agriculture can be useful as an important thing or an important alternative⁽⁸⁾.

Organic farming is considered as an important alternative as we see soil fertility decreasing due to modern agricultural technology and chemical fertilizers⁽⁹⁾.

Charyulu, and Dwivedi, (2016) Organic farming systems have attracted increasing attention over the last one decade because they are perceived to offer some solutions to the problems currently besetting the agricultural sector. Organic farming has the potential to provide benefits in terms of environmental protection, conservation of non-renewable resources and improved food quality.

Yadava, (2019) Organic farming is a societal need; it is not only from the consumer's perspective but also from a farmer point of view. For the transformation of rural agriculture into a well sustainable agriculture, organic farming might become a

panacea which can build a plinth for sustainable agriculture and reimburse conversion cost and maintain the sustainability of soil.

Varkey, (2020) and Magnaye, (2018) contend that countries, developing as well as developed are emphasising environment sustainability of agricultural production, methods, and practices. The traditional wisdom of farmers on indigenous agrarians practices increasingly being into question owing to a host of factors.

Giovannucci, (2007) examines the relationship between smallholder organic farming and entrepreneurship considering the environmental conservation approach of organic farming and the economic enhancement features of entrepreneurship. Furthermore, it intends to determine, through qualitative analysis using case studies, how smallholder organic farming can be planned, and the competencies needed by an organic farmer when venturing into an organic farm enterprise.

Yadav, et al., (2013) assert that, find that there is significant evidence that organic methods could be favourable for small farmers. In fact, most of the cases clearly noted several direct benefits and related externalities from which it is reasonable to conclude that the promotion of organic agriculture methods among small and resource-poor farmers can be well warranted.

CONCLUSION

Organic farming can produce good quality food. This organic farming does not have any harmful effect on the health of the soil and the environment. Due to this, human can get food and food grains in proper form without the effect of organic fertilizers on human health. Due to all these factors, it is necessary for the next generation to get the use of these environmental factors. Even though organic farming is not affordable, it is needed in modern times. Because various problems of human health and environment are arising due to various factors, we also see that human health is in great danger.

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STUDY ON THE USE OF GARLIC EXTRACT (*ALLIUM SATIVUM*) IN LOWERING DYSLIPIDEMIA LEVELS IN MALE WISTAR RATS CONSUMING A HIGH-FAT DIET AND PROPYLTHIOURACIL

Wu Dawei, Suhartina

*Master of Clinical Medicine Study Program, Department of Clinical Medicine, Faculty of Medicine,
Dentistry, and Health Sciences (FKKGIK), Universitas Prima Indonesia*

ABSTRACT

The investigation into dyslipidemia, associated with an increased cardiovascular risk, focuses on evaluating the effectiveness of garlic extract (*Allium sativum*) in reducing lipid levels in rats subjected to a high-fat diet and PTU (propylthiouracil). Elevated lipids significantly contribute to cardiovascular diseases, emphasizing the importance of effective management for prevention. This study explores the antidyslipidemic potential of Garlic (*Allium sativum*) using male Wistar rats in a Pre-test and Post-test group-only control design. Phytochemical screening revealed the presence of various compounds, including Alkaloids, Saponins, Flavonoids, Tannins, Steroids, and Terpenoids, in the methanol extract of garlic. The research concludes that this extract significantly reduces total cholesterol, triglycerides, and LDL levels while increasing HDL levels in experimental rats. Notably, the decrease in SGOT levels positively impacts liver health, potentially reducing the risk of Non-Alcoholic Fatty Liver Disease (NAFLD). Despite promising findings, further confirmation through human studies is necessary before considering Garlic (*Allium sativum*) methanol extract as an effective therapy. With observed improvements in lipid profiles and liver health, the methanol extract of garlic holds potential as an active ingredient for developing antidyslipidemia therapy.

KEYWORDS: *Dyslipidemia; Garlic extract (Allium sativum); Cardiovascular risk Antidyslipidemic potential; Experimental rat study*

BACKGROUND

Dyslipidemia is a condition of abnormal lipid levels in the blood that is often associated with an increased risk of cardiovascular disease. This study aims to evaluate the effectiveness of garlic extract (*Allium sativum*) in reducing dyslipidemia levels in male Wistar rats consuming a high-fat diet and PTU (propylthiouracil) (Halawani *et al.*, 2019). Dyslipidemia plays a significant role in the development of cardiovascular diseases, and managing blood lipid levels, such as using garlic extract, is expected to provide therapeutic benefits. Dyslipidemia, referring to abnormal lipid levels in the blood, significantly contributes to the development of cardiovascular diseases (J *et al.*, 2013). Elevated levels of total cholesterol, triglycerides, and LDL (bad cholesterol), along with low levels of HDL (good cholesterol), can increase the risk of atherosclerosis, the foundation of many cardiovascular diseases, including heart attacks and strokes (Aguilar-Ballester *et al.*, 2021). Therefore, the management and treatment of dyslipidemia are crucial to prevent potential risks of serious cardiovascular diseases. Further understanding of the effectiveness of alternative therapies, such as garlic extract, in addressing dyslipidemia can contribute significantly to preventing and treating cardiovascular diseases (Rouf *et al.*, 2020); (Ansary *et al.*, 2020).

The administration of PTU (Propylthiouracil) and a high-fat diet is expected to create dyslipidemia conditions in experimental rats. PTU is used to induce hypothyroidism in

rats, which can affect lipid metabolism. Hypothyroidism can increase blood lipid levels, including total cholesterol and triglycerides. Meanwhile, a high-fat diet can improve the body's production and accumulation of lipids. The combination of PTU administration and a high-fat diet is expected to create dyslipidemia conditions in rats, reflecting situations often associated with unhealthy eating patterns and thyroid disorders in humans, forming a relevant experimental model to evaluate the impact of garlic extract (Lin *et al.*, 2017).

Garlic (*Allium sativum*) has received widespread attention as a potential supporter of cardiovascular health through various mechanisms. Active compounds, especially allicin and other sulfur compounds are known to reduce total cholesterol and LDL (bad cholesterol) levels. Allicin also affects the HMG-CoA reductase enzyme, contributing to the regulation of cholesterol synthesis in the liver. Additionally, garlic can increase HDL (good cholesterol) through its antioxidant properties, protecting HDL from oxidation. Garlic components also possess anti-inflammatory and antiproliferative properties that protect blood vessels from inflammation and cell damage, reducing the risk of atherosclerosis. The vasodilator properties of garlic play a role in regulating blood pressure, while its anti-thrombotic effects help prevent blood clot formation. Furthermore, garlic protects blood vessel endothelium, maintaining elasticity and everyday function, including its ability to lower total cholesterol, triglyceride, and LDL levels



and increase HDL levels (Qidwai and Ashfaq, 2013); (Suleria *et al.*, 2015).

This background underscores the importance of understanding the potential role of garlic in addressing dyslipidemia, which can positively contribute to the prevention of cardiovascular diseases. This study is expected to provide further insights into the effectiveness of garlic extract in the context of dyslipidemia induced by a high-fat diet and PTU.

RESEARCH METHODS

This experimental study adopts the Pre-test and Post-test group-only control design approach, utilizing male Wistar rats as research subjects. The research was conducted in January 2024. The calculation of the sample size was performed using the Federer formula with the requirement of

$$(r-1)(t-1) \geq 15,$$

where 'r' represents the number of samples in each treatment group, and 't' is the number of treatment groups.

$$(r-1)(6-1) \geq 15$$

$$5(r-1) \geq 15$$

$$r-1 \geq 15/5$$

$$r \geq 3 + 1$$

$$r \geq 4$$

Based on the calculation results, it can be concluded that a minimum of 4 male Wistar rats (*Rattus norvegicus*) with a weight ranging from 180 to 200 grams and an age between 2-4 months is required for each treatment group.

Equipment

Surgical instruments, laboratory glassware, aluminum foil, blender (Miyako), porcelain dish, desiccator, incubator, glass slides, cover glass, porcelain crucible, drying cabinet, microtubes, light microscope, analytical balance (Vibra AJ), oral sonde, electric oven (Stork), water bath (Yenaco), tube clamps, reaction tube rack, rotary evaporator, centrifuge, set of water content determination tools, UV spectrophotometer (Microlet 3000), injection syringe, muffle furnace (Nabertherm), reaction tubes, animal scales (Presica).

Materials

The materials used in this research are Garlic (*Allium sativum*), methanol, Aquades (distilled water), Na-CMC (Sodium Carboxyl methylcellulose), simvastatin, rice husk, rat pellet food, phytochemical screening reagents, and ketamine.

Sample Determination

Garlic (*Allium sativum*) samples used in this study were obtained from one of the traditional markets in Medan City.

Manufacture of Garlic (*Allium sativum*) Simplisia

Identified Garlic (*Allium sativum*)s was washed thoroughly with running water, drained, and spread on blotting paper until dry. The samples were then weighed and dried by air-drying, and the weight of the dried material was measured. The dried Garlic (*Allium sativum*) material was ground into powder to form simplisia (Kosasih *et al.*, 2019).

Preparation of Garlic (*Allium sativum*) Methanol Extract

Garlic (*Allium sativum*) weighing 200 grams each was extracted using the maceration technique with 400 ml of 98% methanol solvent. Maceration was carried out for one week with occasional stirring. The filtrate was then evaporated using a rotary vacuum evaporator at 50°C until a paste-like extract was obtained and stored at 20°C (Vasanthakumar D *et al.*, 2015).

Phytochemical Screening

Phytochemical screening in this study followed a modified Farnsworth method, including the identification of phenols, steroids/triterpenoids, terpenoids, saponins, flavonoids, tannins, and alkaloids (Widowati *et al.*, 2016, 2017, 2018).

Anti-Dyslipidemia Effect Testing

Preparation of 0.5% Na CMC Suspension

0.5 grams of Na CMC was scattered into a mortar containing 10 mL of hot distilled water. After 15 minutes, a transparent mass was obtained, ground to form a gel, diluted with a little filtered water, and poured into a 100 mL volumetric flask. Distilled water was added to the mark. This suspension would be used further as a dispersing medium for oral suspension (Colloid) (Mutia and Chiuman, 2019).

Preparation of Hypercholesterolemic Feed Suspension

The suspension was made by mixing 300 grams of animal fat into 100 ml of distilled water and 200 grams of poultry egg yolk into 1 ml of 0.5% Na-CMC (Harsa, 2014).

Preparation of PTU Suspension

100 mg of PTU was ground in a mortar to form a powder, then added to a 0.5% Na CMC suspension and put into a 10 mL volumetric flask. The volume was adjusted to the mark with 0.5% Na CMC suspension (Untari and Pramukantoro, 2020).

Garlic Extract (*Allium sativum*) Suspension

1.2 grams of Garlic Extract (*Allium sativum*) was added to a mortar, and Na CMC, 0.5% suspension, was gradually added while grinding until homogenous. This mixture was then poured into a 10 mL volumetric flask. The volume was adjusted with Na CMC 0.5% suspension to the mark (Mutia and Chiuman, 2019).

Simvastatin Suspension Preparation

10 mg of simvastatin was ground in a mortar to form a powder, then added to a 0.5% Na CMC suspension and put into a 25 mL volumetric flask. The volume was adjusted to the mark with 0.5% Na CMC suspension (Fouad and Jresat, 2013; Aldahmash and El-Nagar, 2016).

Induction of Dyslipidemia in Experimental Animals

The induction process was performed by providing a high-fat diet and PTU to the experimental animals for 14 days. PTU was given as an oral suspension at 12.5 mg/day (1.25 ml/day) divided into two doses. Meanwhile, the high-fat diet was provided by administering a high-fat feed suspension at a dose of 15 g/kgBW for animal fat suspension and 10 g/kgBW for



poultry egg yolk suspension (Harsa, 2014; Untari and Pramukantoro, 2020).

Measurement of Lipid Profile Parameters

The rats were satisfied at least 8 hours before the blood draw. Blood collection is done by direct withdrawal from the heart of mice as much as 1 ml. Put into a microtube and let stand ± 20 minutes. Then, the blood was centrifuged at a rate of 3000 rpm for 15 minutes to obtain the blood serum of the rats. The determination of lipid profiles is determined by the colorimetric method. Lipid profile examination is conducted at the Health Laboratory, North Sumatra Provincial Health Office.

Measurement of Biochemical Parameters of SGOT and SGPT

Blood collection is done by direct withdrawal from the heart of mice as much as 1 ml. Put into a microtube and let stand ± 20 minutes. Then, the blood was centrifuged at a rate of 3000 rpm for 15 minutes to obtain the blood serum of the rats. The determination of SGOT and SGPT levels is based on enzymatic reactions using Dyasis® kit reagents. The procedure for determining SGOT and SGPT catalyst activity is based on work

procedures from Dyasis®. SGOT and SGPT examinations are conducted at the Health Laboratory, North Sumatra Provincial Health Office.

Analyzes Data

The research data was then analyzed using the SPSS 25 program. The research data were analyzed descriptively (Central tendency and Dyspersi) from the data in lipid profiles (LDL, HDL, Total Cholesterol, and Triglycerides), color, texture, and weight. Then, the research data in the form of lipid profiles were analyzed with One-Way Anova to see if the data was generally distributed with further tests in the form of Post Hoc Tukey HSD tests to see fundamental differences between treatments. However, if the data is abnormally distributed, the Kruskall-Wallis test is used as an alternative.

Research Results

After extraction using the maceration method on garlic (*Allium sativum*) samples, the following extract characteristics were found:

Table 1. Parts of Methanol Extract of Garlic (*Allium sativum*) (*Zanthoxylum acanthopodium*)

Characteristics	Value
Fresh Simplisia Weight (gr)	800 gr
Dry Simplisia Powder Weight (gr)	244 gr
Solvent Volume (ml)	2165 ml
Extract weight (gr)	14,98 gr
Yield (%)	7.12%

The table data above shows that from 500 grams of Garlic (*Allium sativum*) samples, an extract of 14.98 grams was found.

Thus, the yield obtained from Garlic (*Allium sativum*) methanol extract is 7.12%.

Table 2. Phytochemical Screening Results of Garlic (*Allium sativum*) Methanol Extract

Phytochemicals	Reagents	Result
Alkaloid	Bouchardart	+
	Mayer	+
	Dragondroff	-
	Wagner	+
Saponin	Aquadest + Alcohol 96%	-
Flavonoid	FeCl3 5%	+
	Mg (s) + HCl (p)	-
	NaOH 10%	-
	H2SO4 (p)	-
Tanin	FeCl3 1%	+
Steroid dan Terpenoid	Salkowsky	-
	Liberman Bouchard	+

The data in the table above shows that the methanol extract of Garlic (*Allium sativum*) contains several phytochemical

compounds, including Alkaloids, Saponins, Flavonoids, Tannins, Steroids, and Terpenoids.

Table 3. Results of Normality Test Using Shapiro-Wilk Test for All Research Parameters

Parameter	P Value	Data Distribution
Weight	0.442	Usual
Total cholesterol before induction	< 0.05	Abnormal
Total cholesterol after induction	< 0.05	Abnormal
Lipid Profile After Treatment	0.412	Usual
	0.004	Abnormal



	< 0.06	< 0.06	Abnormal
	0.245	0.135	Usual
Up to SGOT		< 0.05	Abnormal
Up to SGPT		0.125	Usual

The table above shows that the data on body weight, total cholesterol, and LDL levels from the lipid profile after treatment and SGPT levels have a standard distribution. At the same time, other parameters include total cholesterol before and after induction, triglyceride levels, HDL levels, and SGOT

levels, which are abnormally distributed. Based on the distribution of these data, data with standard data distribution are analyzed with parametric statistics, while abnormal data is analyzed with non-parametric statistics.

Table 4. Differences in Rats' Initial Body Weight in the Entire Treatment Group

Treatment Group	Weight Loss (grams)		P Value
	Mean	SD	
Usual	354.00	37.67	0.745
Standard	339.85	16.33	
Control	395.11	33.67	
Methanol Extract of Garlic (<i>Allium sativum</i>)-I	366.21	36.13	
Methanol Extract of Garlic (<i>Allium sativum</i>)-II	335.85	33.88	
Methanol Extract of Garlic (<i>Allium sativum</i>)-III	281.12	18.81	

From the table data above, it can be seen that the P value > 0.05 (P value = 0.745), which means there is no significant difference in the initial body weight of the mice used in this

study. The importance of the mice used in this study ranged from 210-400 grams, evenly distributed in each treatment group.

Table 5. Comparison of Total Cholesterol Before and After High-Fat Diet in All Treatment Groups

Treatment Group	Total Kolestrol (mg/dL)	
	Before Induction	After Induction
Usual	115.50 (110-116)	117.60 (115-120) ^b
Standard	112.00 (100-115)	211.00 (205-215) ^a
Control	116.65 (110-115)	211.55 (210-215) ^b
Methanol Extract of Garlic (<i>Allium sativum</i>)-I	115.55 (110-117)	212.60 (209-211) ^b
Methanol Extract of Garlic (<i>Allium sativum</i>)-II	110.50 (100-115)	210.50 (209-212) ^b
Methanol Extract of Garlic (<i>Allium sativum</i>)-III	116.50 (116-119)	211.25 (209-210) ^b
P Value	0.861	0.004

Data is displayed as Median (Range). The P value is obtained from the Kruskal-Wallis analysis. Different superscripts in the same column show significant differences.

difference (P value = 0.782). This demonstrated that the total cholesterol data of the rats before being given a high-fat diet were uniform. However, total cholesterol in all groups of rats after administration of a high-fat diet showed a different distribution, where only the control group, standard methanol extract of Garlic (*Allium sativum*)-I, II, and III, showed uniform total cholesterol.

From the table data above, it can be seen that before being given a high-fat diet, the total cholesterol of rats before giving a high-fat diet in the entire treatment group did not show a significant

Table 6. Comparison of Lipid Profiles in the Entire Mouse Treatment Group

Treatment Group	Profil Lipid			
	Total Kolestrol*	Trigliserida**	LDL*	HDL**
Usual	164.50 ± 2.40a	99.50 (97-100)a	60.20 ± 1.60a	66.45 (61-64)a
Standard	144.50 ± 0.58b	105.25 (101-105)b	64.00 ± 1.20b	61.50 (60-66)a
Control	179.25 ± 6.02c	170.25 (168-179)c	112.50 ± 6.805c	28.75 (68-46)b
Methanol Extract of Garlic (<i>Allium sativum</i>)-I	168.25 ± 1.50d	166.50 (164-165)d	86.75 ± 2.62d	57.50 (56-59)b
Methanol Extract of Garlic (<i>Allium sativum</i>)-II	163.25 ± 2.22e	120.50 (113-122)e	77.50 ± 1.29e	61.50 (61-63)a
Methanol Extract of Garlic (<i>Allium sativum</i>)-III	151.75 ± 0.96e	110.00 (108-112)f	68.50 ± 1.29f	61.00 (60-63)a
P-value	< 0.05	0.013	< 0.05	0.009



*The data is displayed as Mean \pm SD. P value obtained from One Way ANOVA analysis; **Data is expressed as Median (Range). The P value is obtained from the Kruskal-Wallis analysis. Different superscripts in the same column show significant differences

The study included different treatment groups with variations in lipid profiles. The usual treatment group showed a total cholesterol level of $164.50 \pm 2.40a$, triglycerides at 99.50 (97-100), LDL at $60.20 \pm 1.60a$, and HDL at 66.45 (61-64)a. The standard treatment group exhibited changes with total cholesterol at $144.50 \pm 0.58b$, triglycerides at 105.25 (101-105)b, LDL at $64.00 \pm 1.20b$, and HDL at 61.50 (60-66)a. The control group, serving as a baseline, had a total cholesterol level

of $179.25 \pm 6.02c$, triglycerides at 170.25 (168-179)c, LDL at $112.50 \pm 6.805c$, and HDL at 28.75 (68-46)b. The treatment groups with Methanol Extract of Garlic (*Allium sativum*) showed variations in their lipid profiles: Group I at $168.25 \pm 1.50d$, Group II at $163.25 \pm 2.22e$, and Group III at $151.75 \pm 0.96e$ for total cholesterol. Triglycerides were recorded as 166.50 (164-165)d, 120.50 (113-122)e, and 110.00 (108-112)f, respectively. LDL values were $86.75 \pm 2.62d$, $77.50 \pm 1.29e$, and $68.50 \pm 1.29f$, while HDL levels were 57.50 (56-59)b, 61.50 (61-63)a, and 61.00 (60-63)a. The p-values indicated statistically significant differences in total cholesterol ($p < 0.05$), triglycerides ($p = 0.013$), LDL ($p < 0.05$), and HDL ($p = 0.009$) among the treatment groups, suggesting the potential impact of garlic extract on lipid profiles.

Table 7. SGOT and SGPT Levels in All Treatment Groups

Treatment Group	Kadar SGOT (U/L)	Kadar SGPT (U/L)
Usual	24.24 (24-30) ^a	44.40 \pm 1.40 ^a
Standard	110.40 (104-112) ^b	170.74 \pm 1.29 ^b
Control	140.40 (142-170) ^c	97.24 \pm 1.40 ^c
Methanol Extract of Garlic (<i>Allium sativum</i>)-I	114.40 (114-120) ^d	100.74 \pm 3.49 ^d
Methanol Extract of Garlic (<i>Allium sativum</i>)-II	127.40 (121-124) ^e	114.40 \pm 4.41 ^e
Methanol Extract of Garlic (<i>Allium sativum</i>)-III	133.40 (129-132) ^f	142.40 \pm 2.04 ^b
P Value	0.004	< 0.05

*The data is displayed as Mean \pm SD. P value obtained from One Way ANOVA analysis; **Data is expressed as Median (Range). The P value is obtained from the Kruskal-Wallis analysis. Different superscripts in the same column show significant differences

The treatment groups were evaluated based on their SGOT and SGPT levels, revealing variations. The usual treatment group exhibited SGOT at 24.24 (24-30)a and SGPT at $44.40 \pm 1.40a$. The standard treatment group showed considerable changes with SGOT at 110.40 (104-112)b and SGPT at $170.74 \pm 1.29b$. As a baseline, the control group displayed SGOT at 140.40 (142-170)c and SGPT at $97.24 \pm 1.40c$. The Methanol Extract of Garlic (*Allium sativum*) treatment groups presented distinct SGOT and SGPT values: Group I at 114.40 (114-120)d, Group II at 127.40 (121-124)e, and Group III at 133.40 (129-132)f for SGOT. The corresponding SGPT values were $100.74 \pm 3.49d$, $114.40 \pm 4.41e$, and $142.40 \pm 2.04b$. The p-values indicated statistically significant differences in SGOT ($p = 0.004$) and SGPT ($p < 0.05$) among the treatment groups, suggesting the potential impacts of garlic extract on liver enzyme levels.

DISCUSSION

The results showed that methanol extract from garlic (*Allium sativum*) positively affected lipid profiles in rats. This can be seen from the increase in HDL (good cholesterol) levels and a decrease in total cholesterol, triglycerides, and LDL (bad cholesterol) levels in rats that received treatment with Garlic methanol extract (Franczyk *et al.*, 2021). These findings indicate the potential use of garlic extract as an agent to support a reduced risk of lipid disorders, such as dyslipidemia. Garlic (*Allium sativum*) has long been recognized for its potential to affect lipid profiles positively (Asgharpour *et al.*, 2021). Nutritionists and health experts observe that active compounds in garlic, such as allicin, flavonoids, and saponins, can decrease total and LDL cholesterol (bad cholesterol) levels. Heart health research shows that garlic can reduce the risk of cardiovascular disease by increasing HDL (good cholesterol) levels and

inhibiting LDL oxidation. From a phytochemical perspective, compounds in garlic, especially allicin, can modulate enzymes involved in lipid metabolism (Xu *et al.*, 2023). Pharmacologists highlight garlic's anti-inflammatory and antioxidant properties that protect blood vessels from inflammation and oxidative stress, favoring improving a healthier lipid profile (Bautista-Perez *et al.*, 2023).

Methanol extract from garlic (*Allium sativum*) positively affected lipid profiles in mice, which the content of active compounds such as allicin, alliin, ajoene, and diallyl sulfide can explain. The central combination, allicin, was shown to have hypolipidemic properties, capable of lowering lipid levels in the body. Allicin works by inhibiting enzyme activity in cholesterol synthesis, reducing total cholesterol, triglycerides, and LDL (bad cholesterol) levels, and increasing HDL levels (Bontempo *et al.*, 2021). Allicin also stimulates lipoprotein lipase activity, aiding in the breakdown of triglycerides. The antioxidant properties of allicin protect cells from free radical damage, which can contribute to cardiovascular disease. Allicin also has antioxidant, anti-inflammatory, and antiproliferative effects and can inhibit the oxidation of LDL cholesterol, the early stage of atherosclerosis plaque formation. Studies show that allicin affects lipid synthesis by reducing the activity of the enzyme HMG-CoA reductase in the cholesterol biosynthesis pathway (Sánchez-Gloria *et al.*, 2022).

This study revealed that the highest methanol extract from Garlic (*Allium sativum*) gave the most optimal results. This indicates that higher concentrations of bioactive compounds in garlic significantly reduce unwanted lipid levels and increase desired lipid levels in lab rats' blood. The group that received



the garlic extract showed more favorable changes in lipid profile than the control group without treatment, showing garlic's positive potential in lowering the risk of dyslipidemia. These results indicate that dosing a certain level of garlic methanol extract (*Allium sativum*) can have a more robust and positive effect on the lipid profile of mice. The most optimal dose indicates that a better response to changes in lipid levels can be achieved at a given methanol extract dose. This factor can be related to the content of bioactive compounds such as allicin and other compounds in garlic extract, which may have a more significant effect at specific doses. This conclusion illustrates that garlic has properties that favor cardiovascular health through its positive influence on the lipid parameters of the body (Najman *et al.*, 2022).

CONCLUSION

Based on the results of research and data analysis regarding the administration of turmeric ethanol extract (*Curcuma Longa*) and Bioplacenton® for wound healing in rats, it can be concluded that turmeric ethanol extract contains bioactive compounds such as alkaloids, flavonoids, saponins, and tannins that play a role in wound healing. The optimum concentration of effective turmeric ethanol extract is 4%. Although Bioplacenton® (positive control) provided the most remarkable healing results, turmeric extract also has good potential in healing cut wounds. The results of statistical tests showed a significant effect of turmeric extract on the healing of incision wounds in rats. Therefore, turmeric extract has potential as an incision wound healing agent, and further research can be done to support the development of its use in medicine.

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DECOMPOSING REVENUE SOURCES OF MUNICIPALITIES

Lalthlamuana Ralte¹, Prof. Lalhriatpuii²

¹Assistant Professor, Department of Economics, Pachhunga University College, Mizoram

²Professor, Department of Economics, Mizoram University

Article DOI: <https://doi.org/10.36713/epra16159>

DOI No: 10.36713/epra16159

ABSTRACT

Purpose: The study intends to examine the sources of ULBs' revenue. It highlights various revenue sources available to municipalities in India, including funds recommended by Five Year Plans and Finance Commissions

Methodology: This study was primarily based on various Central Finance Commissions' Reports and Five-Year Plan documents.

Results: Fund transfers, including central transfers and state transfers, are the main sources of funds for ULBs in India. Funds allocated for ULBs has been increasing in the Five-Year Plans since the beginning. These transfers have seen an increasing trend over the years, reflecting the realization of the importance of strengthening municipal governance and infrastructure.

KEY WORDS: Municipal Finance, Fund Transfers for Urban Local Bodies.

INTRODUCTION

Having good sources of revenue can provide a broad sense of financial security and stability to urban local bodies. Adequate revenues are required for funding basic urban services and essential social overheads that ranges from education and healthcare to sanitation and waste management. Likewise, long-lasting and adequate sources of revenue are very important for municipal governments to stay financially healthy and to keep fiscal balance or to bring down fiscal deficit. Therefore, to achieve good and sustainable municipal finance is the urban authority's efforts to keep the city moving forward.

Certainly, municipal finance involves the collection of revenues through different channels, such as taxes and non-taxes including user charges, fees, fines, grants and inter-governmental fund transfers, and the allocation of these resources to meet the diverse needs of the residents. For an operational and accountable fiscal future, urban local bodies need to create a strong base of financial sources. In order to fulfil their mandate in a fiscally responsible manner, local governments in developing countries must have significant sources of own tax revenues and non-tax revenues collected from user charges and fees. Adequacy of own revenues is the key to a city's improved ability to deliver necessary goods and services and to better accountability of local officials to their constituents (Martinez-Vazquez, 2015).

For every municipal government, adequate revenues is also the key to improve ability to deliver necessary goods and services to its residents, as well as to get better accountability of authorities to their wards or constituents. Ironically, one of the most common financial features of municipalities in India is lack of adequate revenues. This has resulted in a vicious circle of problems that

aggravates existing municipal economic situations, such as insufficient investments in infrastructure, poor quality of services, lack of willingness of citizens to pay taxes and other user charges, poor state of municipal finances and so on. And this vicious circle needs to be broken by addressing the factors responsible for fiscal gap in cities (Mohanty, 2016).

Municipal corporations or urban local bodies around the globe generate revenue from various sources to provide funding for the growing demands of urban development and various municipal services. These sources typically include:

- 1. Property Taxes:** Property taxes are the primary sources of revenue for municipal corporations and are levied on residential, commercial, and industrial properties based on their annual rental value or the area of the property.
- 2. User Charges or Fees:** Municipal corporations collect fees for various services such as water supply, sanitation, solid waste management, and other municipal services. Municipal government also generated income through the issuance of licenses for businesses, trade activities, and various permits.
- 3. Fines:** Fines and penalties for violating municipal regulations also contribute to the municipal revenue stream.
- 4. Grants and Aids:** Municipal corporations receive grants and aids from the central and state governments for specific projects and programs such as, infrastructure development, urban renewal and the implementation of various schemes to promote the quality of life in urban areas.
- 5. Advertisement/Hoarding Taxes:** Municipal corporations levy taxes on advertisements displayed in public places and on hoardings.
- 6. Leasing of Properties:** Revenue is generated through the



leasing of municipal properties, such as community halls, markets, parking lots, and other commercial spaces.

7. Development Charges: Municipal corporations collect development charges from property developers for approving building plans and for allowing construction activities within the city limits.

8. Special Assessments: In some cases, municipal corporations impose special assessments on property owners for specific improvements or infrastructure projects in their localities.

In India the revenue base of municipal bodies can be broadly categorized into Tax revenues, non-tax revenues, Assigned (shared) revenue, Grants-in-aid, Loans and Other receipts. RBI (2007) broadly categorized the revenue base of municipal corporations as follows:

1. Tax revenue: Tax revenue includes property tax, vacant land tax, octroi, tax on animals, taxes on carriages and carts, advertisement tax.

2. Non-tax revenue: Non-tax revenue comprises municipal fees, sale and hire charges, user charges, lease amounts.

3. Other receipts: Other receipts are such as sundry receipts, lapsed deposits, fees, fines and forfeitures, Law charges costs recovered, rent on tools and plants, miscellaneous sales.

4. Assigned (shared) revenue: Assigned or shared revenue include profession tax, surcharge on stamp duty, entertainment tax, motor vehicles tax.

5. Grants-in-aid: Grants-in-aid are of two types, such as -

(a) Plan grants made available by way of planned transfers from the upper tier of Government under various projects, programmes and schemes, and

(b) Non-plan grants made available so as to compensate against the loss of income and some specific transfers.

6. Borrowings: Borrowings are loans undertaken by the local authorities for capital works etc., mainly from financial institutions, like, Life Insurance Corporation of India, State and Central Governments, banks and municipal bonds in select cases

OBJECTIVES

1. To examine the sources of revenue for ULBs especially the report of FYPs and the recommendations of Finance Commission at the state level as well.
2. To assess policy recommendations for the ULBs in various Five-Year Plans and Central Finance Commissions

LITERATURE REVIEW

The literature on municipal finance encompasses a wide range of topics, including municipal budgeting, revenue generation, expenditure management, financial structure, fiscal sustainability, intergovernmental fiscal relations, and fiscal policies for urban development. Long time back, during the 4th Five Year Plan Bhardwaj discusses the causes of backwardness of municipal bodies In India. He expresses his dissatisfaction in the following words. The way in which the people have dealt with the local bodies in India does not bring credit to the smooth functioning of municipal administration (Bhardwaj,1970).

The financial structure of Urban Local Bodies (ULBs) in India primarily consists of tax and non-tax sources of revenue. The differences in the tax jurisdiction, the degree of control exercised by the State Government in terms of the fixation of tax base, rates, exemptions etc. has a direct impact on the finances of municipalities (Mathur, 2001). Mathur (2006) finds that the finances of municipalities in India are in a grossly unsatisfactory state. The spending levels of municipalities are about 130 per cent lower compared with norms and standards. Oommen (2006) analyses the trends in fiscal decentralisation in India focusing on the 15 non-special category states, based on the data given in the report of the Twelfth Finance Commission. He found out that total expenditure of local government as a proportion of the combined expenditure of Union, States and Local Governments declined from 6.4 per cent in 1998-99 to 5.1 per cent in 2002-03.

Municipal corporations and municipalities raise their own resources from a variety of sources, as provided for in the respective municipal laws. Besides, ULBs receive grants from the State. Property tax on land and buildings is the most important source of income of most urban local bodies (Makandar, 2015). The government at the centre has dismissed the planning commission and replaced it with NITI Aayog, a body for strategic thinking. The closure of planning commission enhances the role of Central Finance Commissions and the State Finance Commissions as the municipal funding body. Focus needs to be laid on strengthening of the organisational as well as financial position of the local bodies. (Singh et al, 2015).

FIVE YEAR PLANS AND MUNICIPAL FINANCE

The Government of India, as envisaged by the Constitution, has been making allocations to local bodies through various Five-Year Plans and Finance Commissions. This section provides a brief overview of such allocations through Five Year Plans (FYPs). Central and State Finance Commissions' grants will be discussed in the next section. Essentially, FYPs and the reports of Finance Commissions are centralized national economic agenda for a span of five years. The First FYP was introduced in 1951. Each plan period has addressed specific challenges and priorities related to urbanization and municipal governance. After a cabinet resolution was passed to wind up the Planning Commission, the central government established National Institution for Transforming India (NITI Aayog) in 2014. Therefore, the Twelfth FYP (2012-2017) was the last plan period for India's planning process.

The emphasis in the First FYP (1951-56) was on setting up Town Planning Departments in states to coordinate urban planning activities. The plan recognized the need for urban housing and included provisions for low-cost housing schemes. According to Singh et.al (2015), the First FYP made a lump-sum provision of Rs 15 crore for local development works, so as to draw local initiative and resources. This was done with an expectation that the municipalities, district and taluka boards and other local bodies would prepare schemes, for which financial assistance would be allocated from this lump-sum provision.



The Second FYP (1956-1961) recognized that Local Bodies had inadequate finances and stressed the importance of urban planning and proposed the establishment of development authorities in cities. Provisions were made for urban development through slum clearance and housing programs. Also the Second Plan provided for the creation of town and country planning laws and initiated planning institutions, after which rigid Master Plans for a number of cities were developed.

Third FYP (1961-1966) comprehended the importance of municipal services and focused on improving urban amenities and services, including water supply, sanitation, and drainage. It aimed to enhance the financial capacity of ULBs through local taxation and revenue generation mechanisms. The Third FYP provided financial assistance for housing for low income groups, improvements in habitable areas, improvements in structure and organization of financial resources for local bodies.

The Fourth FYP (1969-74) aimed to strengthen municipal administration and governance by promoting citizen participation and decentralization of powers. It emphasized the need for better urban infrastructure, including transportation, roads, and solid waste management. The Fourth FYP provided Rs 45 crore planned to be raised by local bodies for urban planning and development. In the Fifth Plan (1974-79) continued the focus on urban infrastructure development, with increased allocations for urban services and amenities. It emphasized the role of ULBs in urban poverty alleviation and social welfare programs. A lump sum Rs 10.27 crore was allocated to local bodies for improving urban sanitation and water supply; Market Borrowings of Rs 3,030 crore was also encouraged by the Planning Commission.

The Sixth FYP (1980-85) was implemented with an objective of rapid industrialization. Rs 1.60 crore allotted for policy formulation and research on urban development, to financially strengthen local bodies. The Sixth Plan required Managerial efficiency of local bodies; financial assistance to local bodies; tax incentives; Rs. 1.60 crore allotted for policy formulation and research on urban development, to financially strengthen local bodies.

Singh et.al (2015) states that Seventh Plan demanded horizontal coordination at local governance level, Taxes recognized as main source of own revenues; recognition of physical and financial targets. The Eight Plan aimed to promote sustainable urban development through initiatives such as urban renewal and

revitalization programs. It emphasized the importance of public-private partnerships (PPPs) in urban infrastructure development. During the Eight FYP (1992-97), the Constitutional amendments were passed in the Parliament popularly known as the 73rd and 74th Amendments. It recognized that Local Bodies needed regulatory as well as financial legislation and resources.

The Ninth Plan (1997-02) aimed at increasing tax revenues, enhancing Autonomy and Power to Local Bodies. This plan focused on improving governance and financial management systems in ULBs. It aimed to enhance service delivery and infrastructure provision in urban areas, with a focus on basic amenities for the urban poor. The Tenth FYP (2002-07) recognized that Centre to State transfers were the main sources of finance. The plan aimed to promote urban reforms, including decentralization of powers, strengthening of local governance institutions, and capacity building for ULBs. It emphasized the need for sustainable urban development and integrated urban planning approaches. Some features of the Tenth Plan was gap in managerial skills and expertise in Municipalities, Transparency of systems, levying of user charges, increasing non-tax revenues and cost control.

Eleventh FYP (2007-12) sought municipalities to be made financially sustainable through Municipal Finance Improvement Program; recognized that there was a gap between revenues and financial requirements of Rs. 76,896 crore. Twelfth Five Year Plan (2012-17) Proposed to set up an urban regulator at State level and increased implementation of information technology at ULB Level.

Definitely, Twelfth to Fourteenth Plans (2012-2022) underscored the significance of creating smart and sustainable cities. They emphasized the need for holistic urban planning, improved service delivery, and the use of technology to enhance the efficiency of urban local governments in addressing the growing challenges of urbanization. Through these Five-Year Plans, India has continually strived to address the complex needs of urban areas, fostering the development of effective governance structures and institutions at the local level. The emphasis on urban development and local governance in these plans has contributed to the evolution of urban local governments, enabling them to play a more proactive role in the sustainable development of urban areas and the overall improvement of the quality of life for urban residents.

**Table 1: Five Year Plans and Select Measures for Urban Local Bodies in India**

FYP	Year	Plan Allocations or Recommendations for Urban Local Bodies
First	1951-56	The focus was on setting up basic infrastructure in urban areas. Funds were allocated for projects such as housing, water supply, sanitation, and roads, which were implemented by ULBs with support from the central and state governments. Rs. 15 crore : Lump-sum provision for local development works for local bodies.
Second	1956-61	Continued emphasis on urban infrastructure development. Allocations were made for initiatives to improve living conditions in urban areas, including slum clearance and housing programs. Recognized that Local Bodies had inadequate finances.
Third	1961-66	Further investments in urban infrastructure and services. Funds were allocated for projects aimed at improving water supply, sanitation, drainage, and transportation systems in urban areas
Fourth	1969-74	The plan aimed to strengthen municipal administration and governance by promoting citizen participation and decentralization of powers. Rs 45 crore planned to be raised by local bodies for urban planning and development.
Fifth	1974-79	This plan continued the focus on urban infrastructure development and emphasized the role of ULBs in urban poverty alleviation and social welfare programs. Rs 10.27 crore allocated to local bodies for improving urban sanitation and water supply.
Sixth	1980-85	The plan aimed to improve urban governance and management through capacity building initiatives for ULBs. It focused on strengthening urban infrastructure and services, particularly in smaller towns and cities. Rs. 1.60 crore allotted for policy formulation and research on urban development.
Seventh	1985-90	This plan emphasized the need for integrated urban development strategies and comprehensive urban planning. It included provisions for urban environmental management and pollution control measures.
Eighth	1992-97	73rd and 74th Amendments were passed. This plan aimed to promote sustainable urban development through initiatives such as urban renewal and revitalization programs. It emphasized the importance of public-private partnerships (PPPs) in urban infrastructure development.
Ninth	1997-02	This plan focused on improving urban governance and financial management systems in ULBs. It aimed to enhance service delivery and infrastructure provision in urban areas, with a focus on basic amenities for the urban poor
Tenth	2002-07	The plan aimed to promote urban reforms, including decentralization of powers, strengthening of local governance institutions, and capacity building for ULBs. It emphasized the need for sustainable urban development and integrated urban planning approaches.
Eleventh	2007-12	Municipalities sought to be made financially sustainable through Municipal Finance Improvement Program; recognized that there was a gap between revenues and financial requirements of Rs. 76,896 crores.
Twelfth	2012-17	Launched AMRUT aimed at providing basic urban infrastructure and services to improve the quality of life in cities. Introduced Swachh Bharat Mission (Urban) aimed at achieving cleanliness and sanitation in urban areas. Proposal to set up an urban regulator at State level.

Source: Various FYPs Documents, Government of India



CENTRAL FINANCE COMMISSIONS AND MUNICIPAL FINANCE

The central government constitutes Central Finance Commissions (CFCs) to give recommendations on the distribution of tax revenue between the Union and the States, and among the States themselves for a period of five years. Thus, ULBs in India are getting grants from the Central Government as well as from the State Governments, mainly based on the recommendations of CFCs and State Finance Commissions (SFCs). These recommendations are essential for ensuring the fiscal stability and autonomy of local bodies. The Commission also plays a vital role in the distribution of central taxes among the local governments, including municipalities. Besides, the Finance Commission suggests measures for the appropriate sharing of funds between the central and local governments, thereby influencing the financial stability and capabilities of urban local bodies in the country.

Before the enactment of the 74th Constitution Amendment Acts (CAA), the Central Government has not involved in any transfer of resources to the ULBs in India. Article 280(3) (c) of the Constitution mandated the Finance Commission to recommend measures to augment the consolidated fund of a state to supplement the resources of panchayats and municipalities based on the recommendations of the respective SFCs. This also includes augmenting the resources of panchayat and municipalities. After the enactment of the 73rd and 74th CAAs, the Centre has constituted six rounds of Finance Commissions, such as, tenth, eleventh, twelfth, thirteenth, fourteenth and fifteenth Finance Commissions. Until the amendments, local governments were under the State Governments' direct control in an *ultra vires* fashion, without legislative provisions (Singh et.al 2015)

After the 74th CAA, the Tenth Finance Commission provided ad-hoc grants to ULBs with central revenues. This is the first time when any CFC has given a serious attempt to meet the requirements of the ULBs and to improve performance, accountability, and credibility of local bodies. These amendments attempted to include important functions like devolution of financial and administrative responsibilities, to the third tier of governance, therefore, making path for fiscal 'federalism' (Singh et.al 2015). Thus, subsequent Finance Commissions allocated the grants for urban local bodies on the basis of the inter-state ratio of slum population or other specific criteria to the states. The CFC's allocations of funds for ULBs have shown the efforts of central government to take concrete steps towards fiscal decentralization.

The 73rd and 74th Constitutional Amendments mandated the state (Governor) to constitute a State Finance Commission every five year to review the financial position of the municipalities and make recommendations, and the recommendations shall be laid before the Legislature of the State. The recommendations by SFCs were supposed to be the base on which the succeeding

CFCs have to make further recommendations to augment local government finances. But, most of the state governments did not constitute the SFCs in time and did not give due importance to strengthening this critical constitutional mechanism. Therefore, the Tenth Finance Commission could not consider the recommendations of SFCs, as these reports were not available at such time.

In spite of such circumstances, the Tenth Finance Commission did indeed make an ad-hoc provision of grants amounting to Rs 1,000 crores for municipalities as grant-in-aid. This provision was made for the award period spanning from 1996 to 2000. These grants were intended to bolster the financial capacities of municipalities and support them in undertaking essential developmental activities and improving service delivery at the grassroots level. Actually, the Tenth Finance Commission did not have a Terms of Reference for local bodies but, with the enactment of the Constitutional Amendment it has additional responsibility apart from its terms of reference to give awards as grants-in-aid for panchayats and municipalities (Mohanty 2016). Rural and urban local bodies were given responsibility to discharge the new role assigned to them under the 73th and 74th Constitutional Amendment during its award period.

The per capita transfer of resources to Mizoram under the recommendations of the Tenth Finance Commission is the highest among the States. The total devolution recommended by the Commission to Mizoram for the period 1995-2000 is Rs. 1,802.01 crore (Rs. 1398.37 crore by way of tax-shares and Rs. 403.64 crore by way of grants-in-aid) representing a step-up of 76.5 percent over the recommendations of the Ninth Finance Commission for the preceding five-year period 1990 - 1995. Apart from the revenue gap grants of Rs. 331.19 crore, the other grants include Rs. 3.32 crore for improvement of local (rural and urban) administration. (Mizoram Budget Speech 1996-97)

The Eleventh Finance Commission had a clear mandate, its terms of reference required to make it obligatory to consider the recommendations about the augmentation of consolidated funds of state in enhancing resources of municipalities. After considering suggestions given by Ministry of Urban Development and others states, it unanimously was felt that provision of basic civic services requires great attention (NIUA, 2011). However, the Commission arrived at arbitrary conclusions as the relevant State Finance Commission reports were not available. It recommended an ad hoc grant of Rs 2,000 crore for municipalities for the award period 2000-05.

The Twelfth Finance Commission's mandate was to recommend the measures needed to augment the Consolidate Fund of a State to supplement the resources of the Panchayats and the Municipalities in the State based on the recommendations made by the Finance Commission of the State. The Commission has recommended a sum of Rs. 25,000 crore for the period 2005-10 as grants-in-aid to increase the consolidated fund of the States to supplement the resources of the municipalities and the



panchayats. This is equivalent to 1.24 per cent of the shareable tax revenue and 0.9 per cent of gross revenue receipts of the Centre as estimated by the Commission during the period 2005-10.

As per the recommendation of the Twelfth Finance Commission, a grant of Rs. 5,000 crore for the urban local bodies may be given to the States for the period 2005-10 with *inter-se* distribution. The Commission set criteria for the *inter-se* allocation of this grant amongst States based on factors and weights assigned by the Commission such as, population, geographical area, distance from highest per capita and revenue effort (with respect to own revenue and GSDP). One important feature of this recommendation was that the Commission stressed the importance of public private partnership to enhance municipal service delivery of solid waste management services in the urban areas. The Commission has urged that state may require municipalities of towns of over 100000 population as per 2001 census to prepare comprehensive scheme including composting and waste to energy programmes to be undertaken in the private sector for appropriate funding from the goals recommended by the Commission, it has suggested earmarking of at least 50 per cent of grant for this purpose. Besides, the Twelfth Finance Commission has further felt it to be imperative that high priority need to be assigned to creation of database and maintenance of accounts at the grass root levels

The Thirteenth Finance Commission, which operated during the period 2010-2015, was tasked with recommending measures to augment the Consolidated Fund of a State in order to supplement the financial resources of Panchayats and Municipalities within the state. These recommendations were based on the suggestions made by the respective State Finance Commission. On the basis of this term of reference the Commission has recommended two categories of grants to local bodies namely, (1) General Basic Grant and (2) General Performance Grant. The general basic grant was intended to provide a basic level of financial support to Panchayats and Municipalities for carrying out their day-to-day functions and providing essential services to citizens. This grant aimed to ensure that local bodies had adequate resources to meet their basic operational expenses and fulfil their statutory obligations. The Thirteenth Finance Commission also recommended a general performance grant for local bodies based on certain performance criteria, which include indicators related to service delivery, fiscal management, governance reforms, and other parameters aimed at improving the effectiveness and efficiency of local governance. The performance grant served as an incentive for local bodies to improve their performance and governance outcomes.

Besides, the Thirteenth Finance Commission proposed measures to augment the resources of Panchayats and Municipalities within each state. These measures could include grants-in-aid, fiscal transfers, or other financial mechanisms aimed at empowering local self-government bodies and enhancing their ability to deliver essential services and undertake developmental

activities at the grassroots level. The grant-in-aid recommended for municipalities for 2010-15 amounted to Rs 23,111 crore, which is four times of the recommended amount by the Twelfth Finance Commission.

Further, the state governments would be eligible to draw down its share of 'General Performance Grant' only if they comply with the conditions laid down by the Commission. The quantum of transfers to municipalities through all central channels, including the Central Finance Commission, Planning Commission and Government of India's ministries, translate to 0.10 per cent of GDP in 2012-13. And with the implementation of the recommendations of the Fourteenth Finance Commission for municipalities, the central transfers-GDP ratio may go up to 0.15 per cent per annum (Mohanty, 2016).

The Fourteenth Finance Commission, which operated during the period 2015-2020, was, *inter-alia*, mandated to recommend measures needed to augment the Consolidated Funds of the state to supplement the resources of the Panchayat and Municipalities based on the recommendations of the respective State Finance Commissions. Some key recommendations of the Fourteenth Finance Commission for urban local bodies include - an increase in share of central taxes, allocation of untied grants, introduction of performance grants, recommendation of grants for basic services such as water supply, sanitation, solid waste management, and urban infrastructure development and emphasis on capacity building for ULBs to enhance their administrative and technical capabilities.

The Commission has recommended Grant-in-aid to duly constituted Panchayats (Rural Local Bodies) and Municipalities (Urban Local Bodies) in two parts, namely - (a) Basic Grant, and (b) Performance Grant. In case of Municipalities, 80 per cent of the Grant will be the Basic Grant and 20 per cent will be the Performance Grant. The 14th Finance Commission has recommended a Basic Grant of Rs 69,715.03 crore for the Municipalities for the period 2015-20. While recommending a quantum jump in the share of states in the divisible pool of central taxes from 32 per cent to 42 per cent, the Commission recommended Rs 2,87,436 crore as grant-in-aid for local bodies. The FFC has worked out the size of the grant to be Rs. 87,144 crore to municipalities is. The Grant-in-aid recommended is fixed for the Award period of 2015-20. Overall, the recommendations of the Fourteenth Finance Commission aimed to empower ULBs and strengthen decentralized governance in urban areas.

The four Finance Commissions, prior to the Fifteenth Finance Commission, that is Eleventh Finance Commission, Twelfth Finance Commission, Thirteenth Finance Commission and Fourteenth Finance Commission used population and area as the criteria to reflect need for resources. The Fifteenth Finance Commission has recommended distribution of grants to states using population data (Census 2011) with a weight of 90 per cent and area with a weight of 10 per cent. Based on the urban and rural population (as per Census 2011) of the respective state, the



grant to each state will be divided into a grant to the duly constituted gram panchayats and a grant to the duly constituted municipalities. Oommen (2015), however, mentions that, population being given such undue weightage is iniquitous. Also, that omission of other relevant criteria can just assist in temporary deferral of democratic decentralisation.

The Fifteenth Finance Commission (FFC) formulated the patterns and criteria for funding Urban Local Bodies (ULBs) in India. To cater to the growing urbanization needs and to achieve sustainable urban development, the Commission has, inter-alia, recommended Rs 1,21,055 crore for ULBs and urban agglomerations/cities for the period 2021-2026, which reflects the Commission's recognition of the importance of addressing the needs of rapidly urbanizing areas and improving urban infrastructure and services. The Commission also stated that 61 per cent of the urban population lives in urban agglomerations which include Urban Local Bodies, census towns and outgrowths, thus the Fifteenth Finance Commission has given differential treatment to the urban agglomerations with more than one million population in distribution of urban local bodies' grants.

The Fifteenth Finance Commission has divided the Urban Local Bodies into two categories: (a) Million-Plus urban agglomerations/cities (excluding Delhi and Srinagar), and (b) all other cities and towns with less than one million population (Non-Million Plus cities). The Commission has recommended separate grants for them. Out of the total grants recommended by the Commission for Non-Million Plus cities, 40 per cent is basic (untied) grant and the remaining 60 per cent is tied grant. Basic grants (untied) are utilised for location-specific felt needs, except for payment of salary and incurring other establishment expenditure. On the other hand, tied grants for the Non-Million Plus cities are released for supporting and strengthening the delivery of basic services.

The following Table 2 shows the increasing trend in central transfers recommended by Finance Commissions for ULBs, which reflects the growing recognition of the importance of urban development and governance in India's overall development agenda.

Table 2: Grants recommended for ULBs under Finance Commissions

<i>Finance Commission</i>	<i>Award Period</i>	<i>Grants for ULBs</i>
10 th Finance Commission	1995-2000	Rs. 1,000 crore
11 th Finance Commission	2000-2005	Rs. 2,000 crore
12 th Finance Commission	2005-2010	Rs. 5,000 crore
13 th Finance Commission	2010-2015	Rs. 23,111 crore
14 th Finance Commission	2015-2020	Rs 87,144 crore
15 th Finance Commission	2020-2025	Rs 1,21,055 crore

Source: 10th, 11th, 12th, 13th, 14th and 15th Finance Commissions' Reports

Also, the funds allocated by Fifteenth Finance Commission to Non-Million-Plus Cities and towns consist of two equal parts: (i) 50 per cent of the allocated amount is Basic Grant (untied) and (ii) 50 per cent of the allocated amount is Tied Grant. Out of the total tied grant, 50 per cent is earmarked for 'Sanitation Solid Waste Management' and attainment of star ratings as developed by the Ministry of Housing & Urban Affairs (MOH&UA). The remaining 50 per cent is tied to 'Drinking water, rainwater harvesting and water recycling'. The tied grants are meant to ensure availability of additional funds to urban local bodies over and above the funds allocated by the Centre and the State for sanitation and drinking water under various Centrally Sponsored Schemes and provide quality services to citizens.

In the following Table 3, the distribution of grants to state and the criteria used by the four Finance Commissions, prior to the Fifteenth Finance Commission, that is Eleventh Finance Commission, Twelfth Finance Commission, Thirteenth Finance Commission and Fourteenth Finance Commission are shown.

Before the Fifteenth Finance Commission, population and area are used as the criteria to reflect need for resources. Oommen (2015), however, mentions that, population being given such undue weightage is iniquitous. Also, that omission of other relevant criteria can just assist in temporary deferral of democratic decentralisation.

We can see from the Table 3 that the criteria and weights (Percentage) adopted by the last four CFCs and the Fifteenth Finance Commission introduced new criteria such as, Forest &

Ecology and demographic performance with weightage of 10 percentage and 12 percentage respectively. The Fifteenth Finance Commission has recommended distribution of grants to states using population data (Census 2011) with a weight of 90 per cent and area with a weight of 10 per cent. Based on the urban and rural population (as per Census 2011) of the respective state, the grant to each state will be divided into a grant to the duly constituted gram panchayats and a grant to the duly constituted municipalities.

**Table 3: Distribution of Grants to states for Urban Local Bodies: Criteria and Weights (Percentage) Adopted by Finance Commissions of India**

Finance Commission	11 th	12 th	13 th	14 th	15 th
Population	40	40	50	90	15
Geographical area	10	10	10	10	15
Distance from highest per capita income	20	20	20	0	45
Index of decentralization	20				
Index of devolution			15		
Index of deprivation		10			
Revenue effort /Tax & Fiscal effort	10	20			2.5
CFC ULB grant utilization index			5		
Forest & Ecology					10
Demographic performance					12

Source : Various CFC Reports (11th, 12th, 13th, 14th and 15th Finance Commissions' Reports)

We can see from the Table 3 that the criteria and weights (Percentage) adopted by the last four CFCs and the Fifteenth Finance Commission introduced new criteria such as, Forest & Ecology and demographic performance with weightage of 10 percentage and 12 percentage respectively. The Fifteenth Finance Commission has recommended distribution of grants to states

using population data (Census 2011) with a weight of 90 per cent and area with a weight of 10 per cent. Based on the urban and rural population (as per Census 2011) of the respective state, the grant to each state will be divided into a grant to the duly constituted gram panchayats and a grant to the duly constituted municipalities

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DESIGN, SYNTHESIS AND ANTIMICROBIAL EVALUATION OF NEW ISATIN-MOXIFLOXACIN BASED 1,2,3-TRIAZOLE COMPOUND

Nisha Kumari, Shailendra Petel, Arun Patel

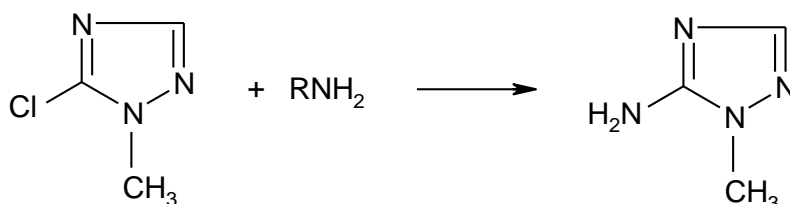
Shri Ram Group of Institutions, Faculty of Pharmacy, Jabalpur- 482 002, M.P., India

INTRODUCTION

Tuberculosis (TB) which is caused mainly by Mycobacterium tuberculosis (MTB), led to 1.3 million deaths and 10 million (5.8 million men, 3.2 million women, and 1.0 million children) newly clinical cases in the year of 2017 according to the World Health Organization (WHO) 2018 report. Moreover, the numbers are in continual increase, especially in developing countries. There are several reasons responsible for this situation, and the wide spread of drug-resistant TB (DR-TB), multidrug-resistant TB (MDR-TB), and coinfection with HIV, as well as the emergence of extensively drug-resistant TB (XDR-TB) and totally drug-resistant TB (TDR- TB) are the major reasons.

Normally it attacks the lungs (pulmonary TB) but can attack other organs as well (extrapulmonary TB) and spreads in the air when patients expel bacteria by coughing, sneezing, or spit. According to World Health Organization (WHO) report, 9.6 million new TB cases were estimated and claiming the lives of 1.5 million people in the year 2014 despite the great advances in chemotherapy and the Bacille-Calmette-Guérin (BCG) vaccine.³ The current standard therapy attributed for TB is a six month regimen, termed DOTS (Directly Observed Therapy, Short-course) in which the initial 2 months include isoniazid (INH), rifampicin (RIF), pyrazinamide (PZA), and ethambutol (E), followed by a 4 month continuation phase of RIF and INH.

Furthermore, TB attracts numerous interests of the scientific community due to high weakness of human immunodeficiency virus (HIV)-infected persons to this disease and the global emergence of multidrug resistant (MDR) defined as resistant to the two most efficient TB drugs, rifampin and isoniazid, and extensively drug-resistant (XDR) strains that are further resistant to the fluoroquinolones and one of the second-line injectable drugs (i.e. amikacin, kanamycin, or capreomycin). The confines of long-term oral chemotherapy and scarce compliance to the current treatment regimen, the discovery of bedaquiline in the end of 2012, build a new hope for the treatment of TB and especially MDR-TB. Nevertheless the side effects of bedaquiline such as nausea, joint pain and headache create a risk in clinical use. Therefore, there is a still need for the development of new and effective antimycobacterials with reduced toxicity, synthetically feasible, stronger efficacy that function by novel mechanisms of action against emerging MDR and XDR TB bacteria and latent diseases in shorter treatment duration.



Acidity of Triazole: The acidity of five parent compounds is compared with that of pyrrole. The acidity of the ring system is increased as the number of nitrogens increases. The acidity of pyrrole is increased for each successive addition of a nitrogen atom. 1,2,3-triazoles are slightly more acidic than 1,2,4-triazoles.

Mechanism of action of Triazole

Triazoles act by inhibiting the fungal cytochrome P-450 enzyme lanosterol 14-demethylase and thus impair the biosynthesis of ergosterol for the cytoplasmic membrane and lead to the accumulation of 14- α -methylsterols. These methylsterols may disrupt the close packing of acyl chains of phospholipids, impairing the functions of certain membrane-bound enzyme systems such as ATPase and enzymes of the electron transport system and thus inhibiting growth of the fungi. The lower toxicity of triazoles compared to imidazole has been correlated with their lower affinity for mammalian Cytochrome P-450 and lesser propensity to inhibit mammalian sterol synthesis. However, because they are active against certain bacteria as well (which do not have ergosterol) other mechanism also appear to be involved.

REVIEW OF LITERATURE

Prevention of diseases continues to be a challenge for the society and mankind as a whole due to some or other reasons, with respect to the development of the living conditions of human being and total mankind. There are number of diseases which spread due to one or other reasons. Some are communicable diseases eg. Tuberculosis. One of the main condition or factor responsible for the spread of disease(s) is the sanitary condition or hygiene. An increasing morbidity and mortality from tuberculosis (TB) in the near future is forecast for the world at large, with the number of newly occurring cases predicted to increase from 7.5 million a year in 1990 to 8.8, 10.2, 11.9 and 31.8 million in the years 1995, 2002, 2005, 2006 respectively.

Tuberculosis (TB) is still a major health concern worldwide and the main cause of death by a single infectious agent, namely *Mycobacterium tuberculosis*. The disease spreads more easily in overcrowded settings and in the conditions of malnutrition and poverty; characteristics typical of developing countries. India contributes nearly 25 percent of the global burden of tuberculosis, India recorded 1.9 million new cases in 2006 and an estimated 70,000 people detected with multi-drug resistant tuberculosis (MDR-TB) require quality second-line treatment in India. An increasing prevalence of multidrug resistance (MDR) in several parts of the world including India has been one of the major reasons for declaring tuberculosis (TB) control as a global emergency by WHO.

The reasons for these problems are numerous. Compliance with even the best available regimen is poor, and treatment failure is all too common. This regimen comprises daily isoniazid (INH), rifampin (RIF), pyrazinamide (PZA), and ethambutol (EMB) treatment for 2 months followed by 4 months of daily doses of INH and RIF To overcome this, the World Health Organization is encouraging widespread implementation of its DOTS (directly observed therapy, short course) strategy. Although existing drugs an often cure TB, the treatment is lengthy, and requires taking a combination of drugs for at least 6 months. However, the therapy is not always successful and often results in patient relapsing. Further, poor patient compliance has led to the emergence of drug-resistant TB, which is even more difficult to treat. The situation is further exacerbated by the emergence of HIV/AIDS, which is a serious risk factor for TB. The above facts indicate an urgent need for the development of novel, more effective drugs with potent sterilizing activity that would shorten the current treatment, and act on persistent and drug-resistant TB.

MATERIALS AND METHODS

SYNTHESIS AND CHARACTERIZATION

REAGENT AND SOLVENT

The drugs Moxifloxacin, Isoniazid and Rifampicin was procured from Taj Pharmaceutical Pvt. Ltd, Mumbai. The 3-bromopropyne, Potassium carbonate and Dimethyl formamide was purchased from CDH, New Delhi. The 6-chloroindoline-2,3-dione, 6-bromoindoline-2,3-dione, 6-nitroindoline-2,3-dione, 6-methyloindoline-2,3-dione, 6-methoxyindoline-2,3-dione, 6-ethylindoline-2,3-dione and Sodium azide was purchased from Sigma Aldrich, Delhi.

SYNTHESIS

Synthesis Scheme-I

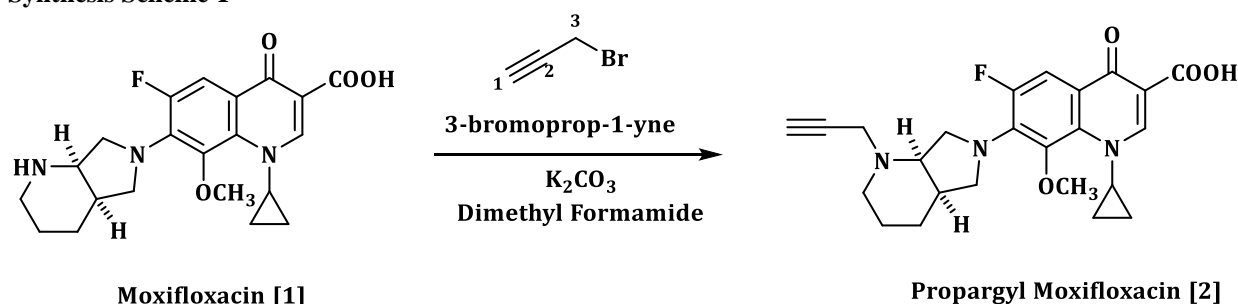


Table : List of the chemicals and their quantity used in Synthesis Scheme-I

S. No.	Chemical	Mol. wt. (g/mol)	Quantity taken (g)
1.	Moxifloxacin	401.18	4.01
2.	3-bromopropyne	118.60	1.18
3.	Potassium carbonate	138.20	1.38
4.	Dimethyl Formamide	73.10	0.73

Procedure

The moxifloxacin (0.01 M) was reacted with 3-bromopropyne (0.01 M) in the presence of potassium carbonate solution in water and Dimethyl formamide (DMF). The solution was refluxed for 45 minutes at 60°C. The resultant was poured to ice cold water to precipitate the resultant product and filter out the product. The synthesized compound was further washed several times with distilled water.^[56] The synthesized compounds propargyl moxifloxacin (Yield 72%) was recrystallized from ethanol and water (7:3% v/v). The List of chemical and quantity used in synthesis scheme-I was represented in Table 1.



Synthesis Scheme-II

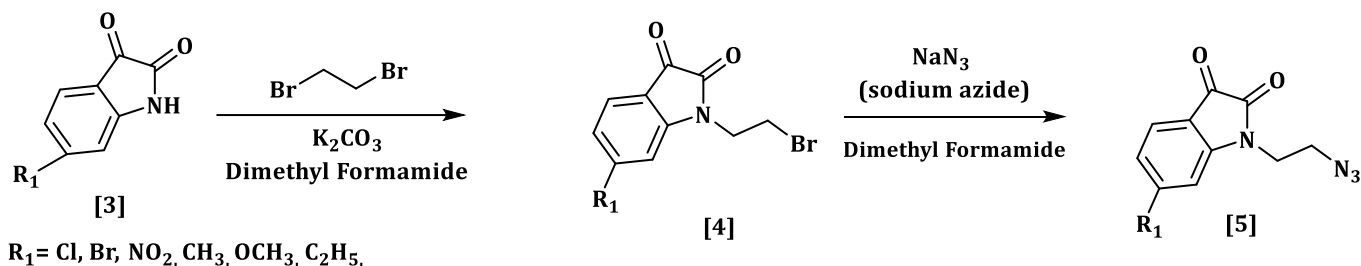


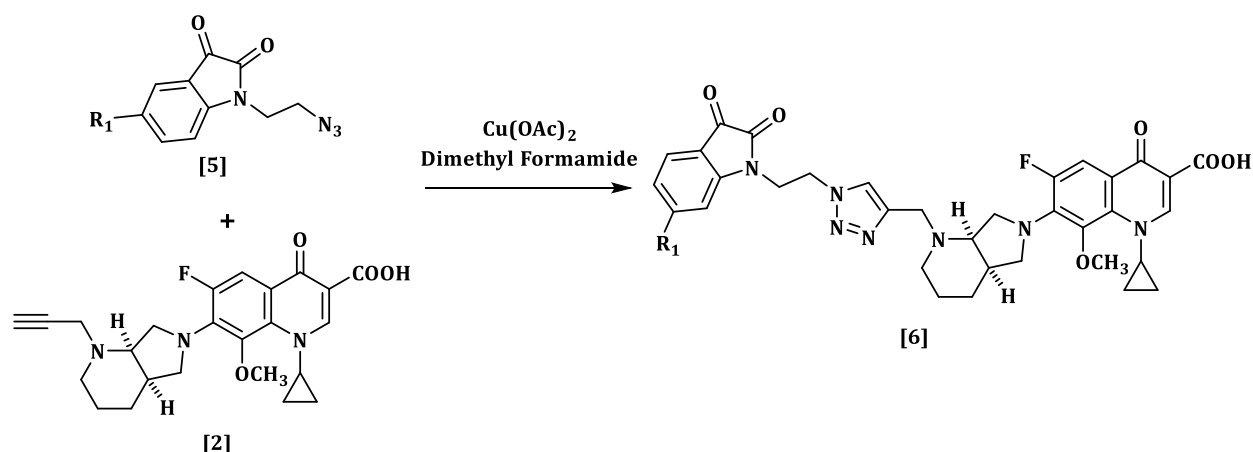
Table 1: List of the chemicals and their quantity used in Synthesis Scheme-II

S. No.	Chemical	Mol. wt. (g/mol)	Quantity taken (g)
1.	6-chloroindoline-2,3-dione	181.58	1.81
2.	6-bromoindoline-2,3-dione	226.03	2.26
3.	6-nitroindoline-2,3-dione	192.13	1.92
4.	6-methyloindoline-2,3-dione	147.18	1.47
5.	6-methoxyindoline-2,3-dione	177.17	1.77
6.	6-ethylindoline-2,3-dione	175.19	1.75
7.	Potassium carbonate	138.20	1.38
8.	Dimethyl Formamide	73.10	0.73
9.	Sodium azide	65.01	0.65

Procedure

The substituted indoline-2,3-dione derivatives [Compound 3, yield 62%] was reacted with the 1,2-dibromo methane in the presence of potassium carbonate solution and dimethyl formamide to form 1-(2-bromoethyl)-6-substituted indoline-2,3-dione [Compound 4, yield 55%]. The reaction was carried out at 60°C.^[57] The result product was filter and washed with cold water. The compounds 4, was further reacted with sodium azide and dimethyl formamide at 60°C to form compound 5, 1-(2-azidoethyl)-6-substituted indoline-2,3-dione, yield 78%) was filtered out and washed with cold water. The List of chemical and quantity used in synthesis scheme-II was represented in Table 2.

Synthesis Scheme-III

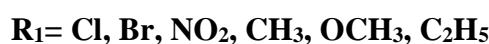
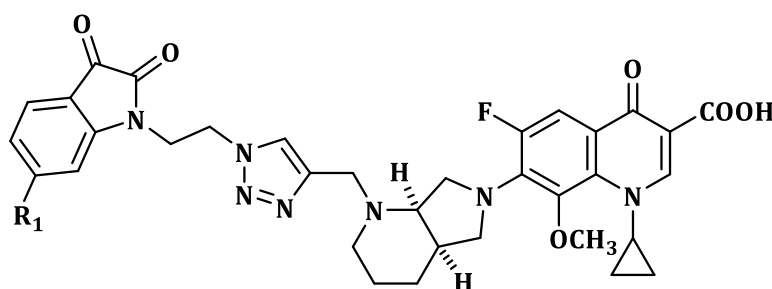


Procedure

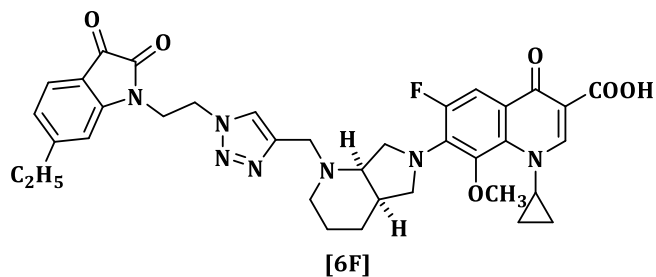
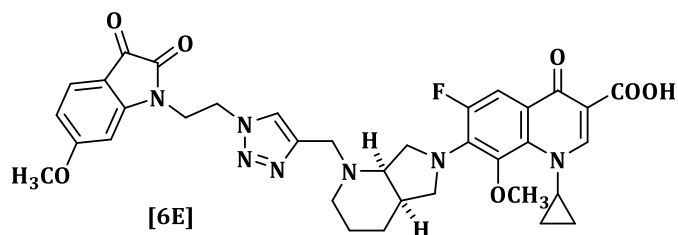
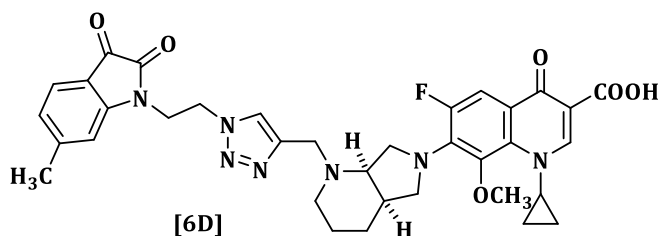
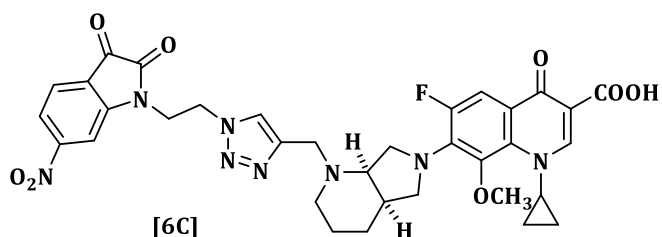
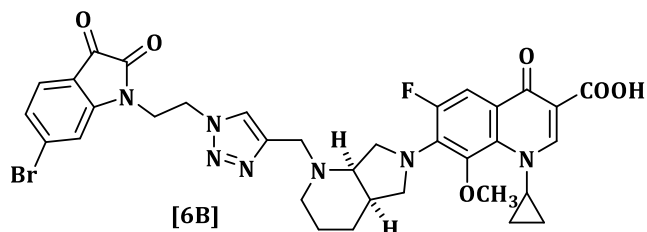
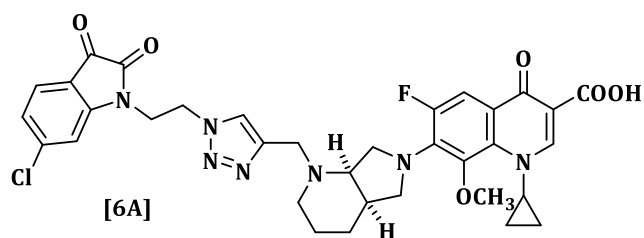
To a mixture of N-(2-azidoethyl)-isatin (1-(2-azidoethyl)-6-substituted indoline-2,3-dione) (0.01 M; 5) and propargyl moxifloxacin (0.01 M; 2) in Dimethyl formamide (50 ml), Cu(OAc)₂ (10 mg) was added under nitrogen atmosphere. The 1,2,3-triazole derivatives 6A to 6F (yield: 53-72%) via Cu-promoted azide-alkyne cycloaddition reaction in the presence of Cu(OAc)₂ in dimethyl formamide (DMF). The mixture was allowed to react for 48 hrs. at room temperature and after removal of the solvent, the residual product [6] was purified by silica gel column chromatography eluted with DCM: MeOH (10:1). The List of chemical and quantity used in synthesis scheme-III was represented in Table 3.

Table 4.3: List of the chemicals and their quantity used in Synthesis Scheme-III

S. No.	Chemical	Mol. wt. (g/mol)	Quantity taken (g)
1.	Propargyl Moxifloxacin	439.49	4.39
2.	1-(2-azidoethyl)-6-chloroindoline-2,3-dione	250.64	2.50
3.	1-(2-azidoethyl)-6-bromoindoline-2,3-dione	295.10	2.95
4.	1-(2-azidoethyl)-6-nitroindoline-2,3-dione	261.20	2.61
5.	1-(2-azidoethyl)-6-methylindoline-2,3-dione	230.23	2.30
6.	1-(2-azidoethyl)-6-methoxyindoline-2,3-dione	246.23	2.46
7.	1-(2-azidoethyl)-6-ethylindoline-2,3-dione	244.25	2.44

List of Final Synthesized Compounds**List of the synthesized compounds with chemical name**

1. **6A:** 7-((4aR,7aR)-1-((1-(2-(6-chloro-2,3-dioxoindolin-1-yl)ethyl)-1H-1,2,3-triazol-4-yl)methyl)octahydro-6H-pyrrolo[3,4-b]pyridin-6-yl)-1-cyclopropyl-6-fluoro-8-methoxy-4-oxo-1,4-dihydroquinoline-3-carboxylic acid
2. **6B:** 7-((4aR,7aR)-1-((1-(2-(6-bromo-2,3-dioxoindolin-1-yl)ethyl)-1H-1,2,3-triazol-4-yl)methyl)octahydro-6H-pyrrolo[3,4-b]pyridin-6-yl)-1-cyclopropyl-6-fluoro-8-methoxy-4-oxo-1,4-dihydroquinoline-3-carboxylic acid
3. **6C:** 1-cyclopropyl-6-fluoro-8-methoxy-7-((4aR,7aR)-1-((1-(2-(6-nitro-2,3-dioxoindolin-1-yl)ethyl)-1H-1,2,3-triazol-4-yl)methyl)octahydro-6H-pyrrolo[3,4-b]pyridin-6-yl)-4-oxo-1,4-dihydroquinoline-3-carboxylic acid
4. **6D:** 1-cyclopropyl-6-fluoro-8-methoxy-7-((4aR,7aR)-1-((1-(2-(6-methyl-2,3-dioxoindolin-1-yl)ethyl)-1H-1,2,3-triazol-4-yl)methyl)octahydro-6H-pyrrolo[3,4-b]pyridin-6-yl)-4-oxo-1,4-dihydroquinoline-3-carboxylic acid
5. **6E:** 1-cyclopropyl-6-fluoro-8-methoxy-7-((4aR,7aR)-1-((1-(2-(6-methoxy-2,3-dioxoindolin-1-yl)ethyl)-1H-1,2,3-triazol-4-yl)methyl)octahydro-6H-pyrrolo[3,4-b]pyridin-6-yl)-4-oxo-1,4-dihydroquinoline-3-carboxylic acid
6. **6F:** 1-cyclopropyl-7-((4aR,7aR)-1-((1-(2-(6-ethyl-2,3-dioxoindolin-1-yl)ethyl)-1H-1,2,3-triazol-4-yl)methyl)octahydro-6H-pyrrolo[3,4-b]pyridin-6-yl)-6-fluoro-8-methoxy-4-oxo-1,4-dihydroquinoline-3-carboxylic acid





Physicochemical Characterization

Table : Physicochemical properties of the synthesized compounds

Comp.	% Yield	Physical Appearance		Melting Point (°c)	Rf Value
		Color	State		
6A	72	Light yellow solid	Solid	170-172°C	0.62
6B	53	Yellow	Solid	143-145°C	0.58
6C	60	Deep Yellow	Solid	160-162°C	0.55
6D	65	Light Yellow	Solid	174-176°C	0.64
6E	68	Yellow	Solid	156-158°C	0.52
6F	58	Yellow	Solid	160-162°C	0.33

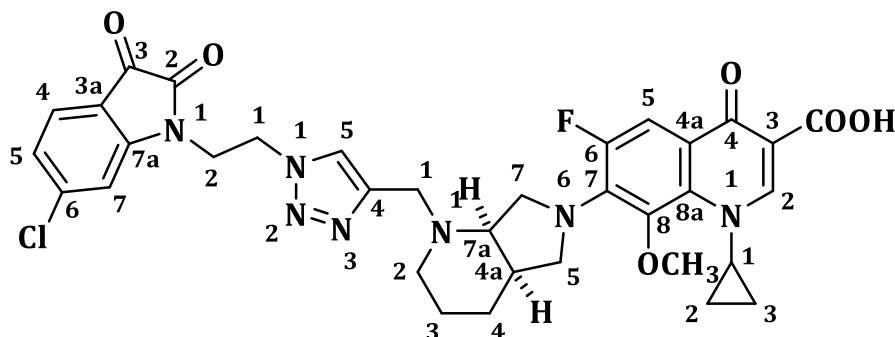
Table : Solubility studies of the synthesized compounds

Compound	Water	Alcohol	Acetone	Glacial Acetic Acid	Benzene	Dimethyl Sulfoxide
6A	-	+++	+	++	-	++
6B	-	+++	+	++	-	++
6C	-	+++	+	++	-	++
6D	-	+++	+	++	-	++
6E	-	+++	+	++	-	++
6F	-	+++	+	++	-	++

- Insoluble; + = Slightly soluble; ++ = soluble; +++ = Freely soluble

- Spectroscopic analysis of Compounds by IR and ¹HNMR

- Compound 6A



- **IUPAC name:** 7-((4aR,7aR)-1-((1-(2-(6-chloro-2,3-dioxindolin-1-yl)ethyl)-1H-1,2,3-triazol-4-yl)methyl)octahydro-6H-pyrrolo[3,4-b]pyridin-6-yl)-1-cyclopropyl-6-fluoro-8-methoxy-4-oxo-1,4-dihydroquinoline-3-carboxylic acid

- **Chemical Formula:** C₃₄H₃₃ClFN₇O₆

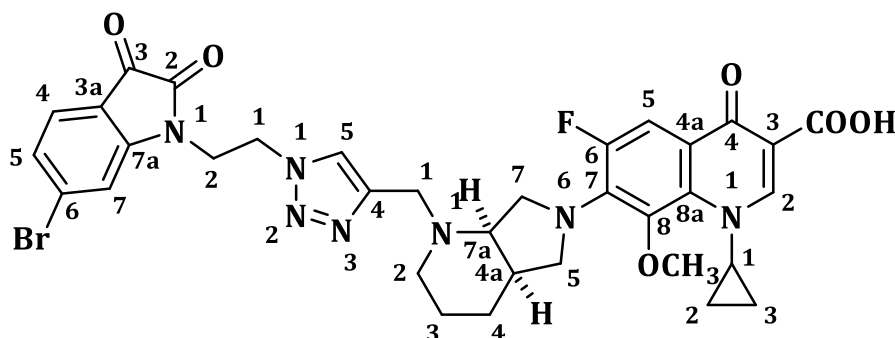
- **Molecular Weight:** 690.13; m/z: 689.22 (100.0%)

- **Elemental Analysis:** C (59.17%); H (4.82%); N (14.21%); O (13.91%)

- **Log P:** 3.04

- **¹HNMR (400 MHz; DMSO-d₆, ppm):** 2.65–2.70 (m, 1H), 2.77–2.79 (m, 1H), 3.55–3.81 (m, 8H), 4.12–4.15 (m, 3H), 4.25 (s, 3H, NOCH₃), 4.66–4.68 (m, 2H), 6.88 (d, 1H, Ar-H), 7.12 (d, 1H, Ar-H), 7.58–7.60 (m, 2H, Ar-H), 7.88 (1H, s, triazole-H), 8.64 (1H, s, C2-H), 15.20 (1H, brs, COOH).

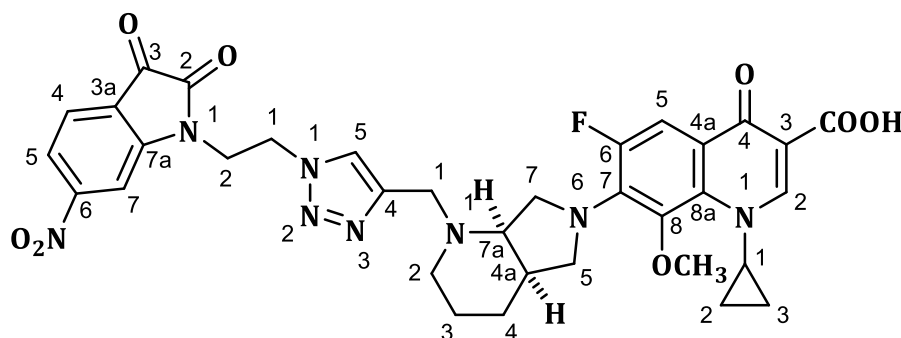
- Compound 6B





- **IUPAC NAME:** 7-((4aR,7aR)-1-((1-(2-(6-bromo-2,3-dioxindolin-1-yl)ethyl)-1H-1,2,3-triazol-4-yl)methyl)octahydro-6H-pyrrolo[3,4-b]pyridin-6-yl)-1-cyclopropyl-6-fluoro-8-methoxy-4-oxo-1,4-dihydroquinoline-3-carboxylic acid
- **Chemical Formula:** C₃₄H₃₃BrFN₇O₆
- **Molecular Weight:** 734.58; m/z: 733.17 (100.0%)
- **Elemental Analysis:** C (55.59%); H (4.53%); N (13.35%); O (13.07%)
- **Log P:** 3.31
- **¹HNMR (400 MHz; DMSO-d₆, ppm):** δ 0.96–1.62 (m, 9H), 2.03–2.09 (m, 1H), 2.38–2.40 (m, 1H), 2.56–2.58 (m, 1H), 2.76–2.79 (m, 1H), 3.56–3.88 (m, 11H), 4.11–4.13 (m, 3H), 4.60–4.62 (m, 2H), 6.80 (d, 1H, Ar-H), 7.10 (d, 1H, Ar-H), 7.61–7.62 (m, 1H, Ar-H), 7.69 (d, 1H, Ar-H), 7.87 (1H, s, triazole-H), 8.66 (1H, s, C2-H), 13.52 (1H, brs, NOH), 15.29 (1H, brs, COOH).

Compound 6C



IUPAC NAME: 1-cyclopropyl-6-fluoro-8-methoxy-7-((4aR,7aR)-1-((1-(2-(6-nitro-2,3-dioxindolin-1-yl)ethyl)-1H-1,2,3-triazol-4-yl)methyl)octahydro-6H-pyrrolo[3,4-b]pyridin-6-yl)-4-oxo-1,4-dihydroquinoline-3-carboxylic acid

Chemical Formula: C₃₄H₃₃FN₈O₈

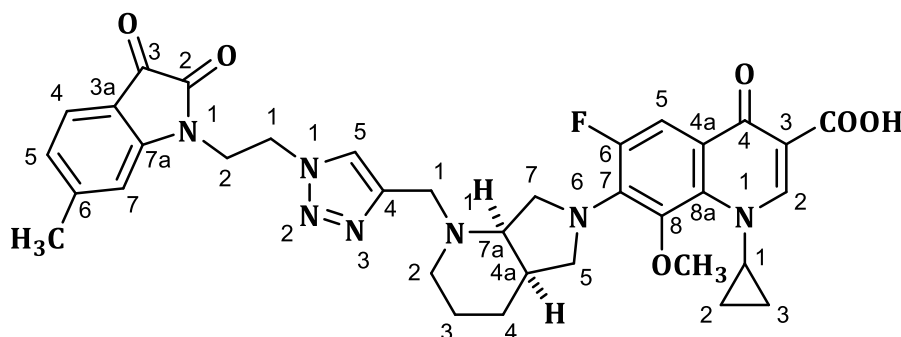
Molecular Weight: 700.68; m/z: 700.24 (100.0%)

Elemental Analysis: C (58.28%); H (4.75%); N (15.99%); O (18.27%)

Log P: 3.97

¹HNMR (400 MHz; DMSO-d₆, ppm): δ 1.00–1.57 (m, 9H), 2.07–2.09 (m, 1H), 2.38–2.39 (m, 1H), 2.64–2.66 (m, 1H), 2.72–2.76 (m, 1H), 3.58–3.83 (m, 8H), 4.10–4.13 (m, 3H), 4.60–4.62 (m, 2H), 6.90 (s, 1H, Ar-H), 7.27 (s, 1H, Ar-H), 7.54 (d, 1H, Ar-H), 7.88 (1H, s, triazole-H), 8.64 (1H, s, C2-H), 8.68, 9.01 (s, 1H, CONH2), 12.17 (s, 1H, NNHCO), 15.21 (1H, brs, COOH).

Compound 6D



IUPAC NAME: 1-cyclopropyl-6-fluoro-8-methoxy-7-((4aR,7aR)-1-((1-(2-(6-methyl-2,3-dioxindolin-1-yl)ethyl)-1H-1,2,3-triazol-4-yl)methyl)octahydro-6H-pyrrolo[3,4-b]pyridin-6-yl)-4-oxo-1,4-dihydroquinoline-3-carboxylic acid

Chemical Formula: C₃₅H₃₆FN₇O₆

Molecular Weight: 669.71; m/z: 669.27 (100.0%)

Elemental Analysis: C (62.77%); H (5.42%); N (14.64%); O (14.33%)

Log P: 2.97

¹HNMR (400 MHz; DMSO-d₆, ppm): δ 1.03–1.55 (m, 9H), 2.04–2.06 (m, 1H), 2.36–2.39 (m, 17H), 2.51 (s, 3H, CH₃); 2.66–2.68 (m, 1H), 2.75–2.78 (m, 1H), 3.55–3.81 (m, 11H), 4.11–4.14 (m, 3H), 4.61–4.62 (m, 2H), 6.88 (s, 1H, Ar-H), 7.34 (s, 1H, Ar-H),

7.65 (d, 1H, Ar-H), 7.83 (1H, s, triazole-H), 8.67 (1H, s, C2-H), 8.69, 9.00 (s, 1H, CONH2), 12.16 (s, 1H, NNHCO), 15.26 (1H, brs, COOH).

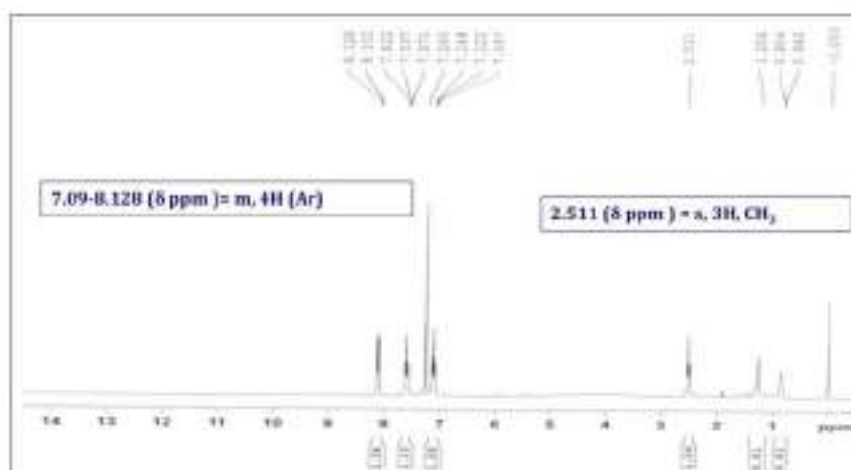
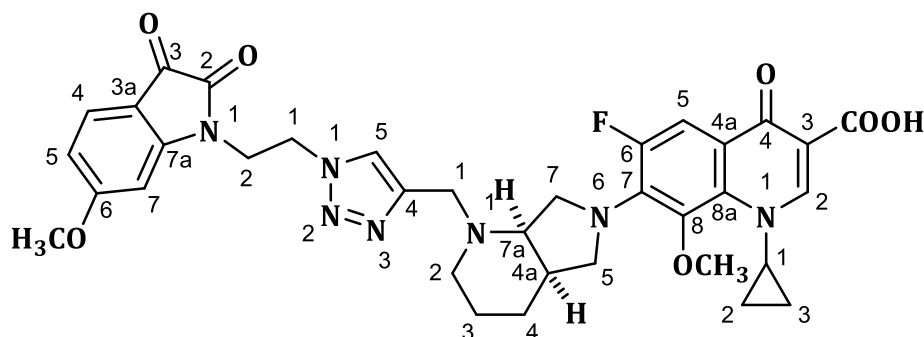


Figure 4.1: IR spectrum of compound 6D

Compound 6E



IUPAC NAME: 1-cyclopropyl-6-fluoro-8-methoxy-7-((4aR,7aR)-1-((1-(2-(6-methoxy-2,3-dioxindolin-1-yl)ethyl)-1H-1,2,3-triazol-4-yl)methyl)octahydro-6H-pyrrolo[3,4-b]pyridin-6-yl)-4-oxo-1,4-dihydroquinoline-3-carboxylic acid

Chemical Formula: C₃₅H₃₆FN₇O₇

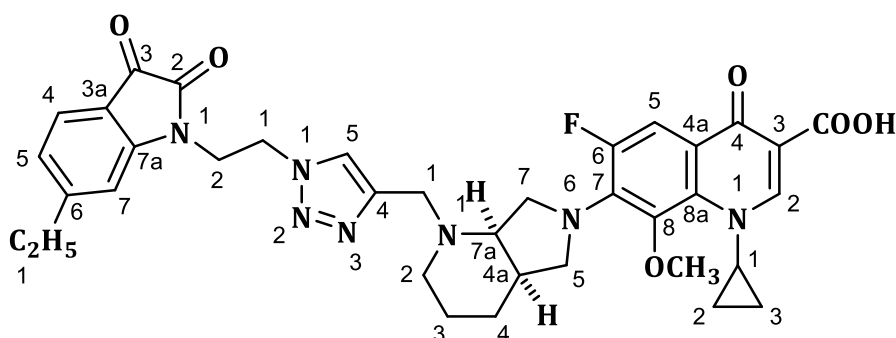
Molecular Weight: 685.71; **m/z:** 685.27 (100.0%)

Elemental Analysis: C (61.31%); H (5.29%); N (14.30%); O (16.33%)

Log P: 2.36

¹HNMR (400 MHz; DMSO-d₆, ppm): δ 1.01–1.64 (m, 9H), 2.11–2.13 (m, 1H), 2.36–2.38 (m, 1H), 2.65–2.74 (m, 1H), 2.83–2.85 (m, 1H), 3.59–3.85 (m, 11H), 4.14–4.17 (m, 3H), 4.24 (s, 3H, NOCH₃), 4.65–4.67 (m, 2H), 6.79–7.04 (m, 2H, Ar-H), 7.47 (d, 1H, Ar-H), 7.71 (d, 1H, ArH), 7.91; (1H, s, triazole-H), 8.71 (1H, s, C2-H), 15.28 (1H, brs, COOH).

Compound 6F





IUPACNAME: 1-cyclopropyl-7-((4aR,7aR)-1-((1-(2-(6-ethyl-2,3-dioxindolin-1-yl)ethyl)-1H-1,2,3-triazol-4-yl)methyl)octahydro-6H-pyrrolo[3,4-b]pyridin-6-yl)-6-fluoro-8-methoxy-4-oxo-1,4-dihydroquinoline-3-carboxylic acid

Chemical Formula: C₃₆H₃₈FN₇O₆

Molecular Weight: 683.74; m/z: 683.29 (100.0%)

Elemental Analysis: C (63.24%); H (5.60%); N (14.34%); O (14.04%)

Log P: 3.39

¹H NMR (400 MHz; DMSO-d₆, ppm): δ 0.95–1.57 (m, 9H), 2.06–2.08 (m, 1H), 2.31–2.34 (m, 1H), 2.58–2.60 (m, 1H), 2.82–2.84 (m, 1H), 3.54–3.79 (m, 8H), 4.09–4.12 (m, 3H), 4.59–4.61 (m, 2H), 6.93 (d, 1H, Ar-H), 7.42–7.47 (m, 2H, Ar-H), 7.61 (d, 1H, Ar-H), 7.98 (1H, s, triazole-H), 8.65 (1H, s, C2-H), 15.26 (1H, brs, COOH).

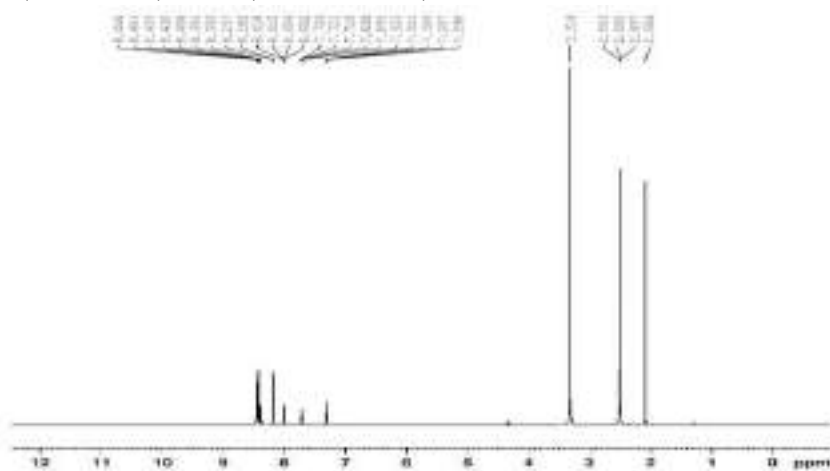


Figure 4.2: IR spectrum of compound 6F

DISCUSSION

The six new derivatives of 1,2,3-triazole derivatives has been synthesized and characterized by Proton Nuclear Resonance Spectrophotometer (¹H NMR). ¹H NMR spectrum of the synthesized compounds has shown the peaks at ppm δ 0.95–1.57 (m, 9H), 2.06–2.08 (m, 1H), 2.31–2.34 (m, 1H), 2.58–2.60 (m, 1H), 2.82–2.84 (m, 1H), 3.54–3.79 (m, 8H), 4.09–4.12 (m, 3H), 4.59–4.61 (m, 2H), 6.93 (d, 1H, Ar-H), 7.42–7.47 (m, 2H, Ar-H), 7.61 (d, 1H, Ar-H), 7.98 (1H, s, triazole-H), 8.65 (1H, s, C2-H), 15.26 (1H, brs, COOH). The melting point was in the ranges of 140 °C to 176 °C of Thin layer chromatography was performed for every individual process and has shown the Retention factor less than 0.7. These all the characterized parameter depicted that compound were synthesized as per expected and confirmed by ¹H NMR analysis.

ANTIMICROBIAL EVALUATION

Microbiology is the study of microscopic organisms such as bacteria, viruses, fungi and protozoa. This discipline includes fundamental research on the biochemistry, physiology, cell biology, ecology, evolution and clinical aspects of microorganisms, including the host response to these agents. Bacterial resistance to existing drugs is a growing problem in the world. Considerable researches have been performed on the synthesis of new quinazolinone derivatives with potent antimicrobial activity. These derivatives possess antibacterial activities, especially against the gram-positive strains, and fungi through their interaction with the cell wall and DNA structure. The term chemotherapeutic agents were initially restricted to antibiotics, but now since microbial metabolites have been isolated for their antimicrobial activity. Hence both synthetic and microbiologically produced drugs need to be included together. However, it would be more meaningful to use the term Anti-microbial agent (AMA) to designate synthetic as well as naturally obtained drugs that attenuate microorganisms.

The antimicrobial drugs occupy uniqueness in the history of medicine. During the entire proceeding history of medicine, less than a handful of drugs had been submitted to systemic laboratory investigation. The exponential development in the antibacterial field is the inevitable result of the momentum created by sulfonamides and penicillin [96]. The term microbe is sometimes applied only to the unicellular microphytes. However, in its broader sense it includes multicellular microphytes and microbes as well therefore antimicrobial studies include antibacterial, antifungal, antiprotozoal and antimycotic studies. After the development of desired new drug molecules with different structure an antimicrobial screening program is necessary to uncover the interesting activity of the



compounds. The inhibition of the microbial growth under standardized condition may be utilized for demonstrating the therapeutic efficacy of the synthesized compounds.

Microorganisms inhabit various sites of the human body, including the skin, nose, mouth and digestive gut. Drugs which are helpful in combating the infectious disease caused by microbes are known as antimicrobial agent. Therefore, it was thought worthwhile to explore out the possibility of the compounds of the present series to be effective antimicrobial agent.

Table 5.1: List of Fungal Strains

S. No.	Fungal strain	MTCC* No.	Incubation Temperature (°C)	Incubation period
1.	<i>Aspergillus Niger</i>	281	25	5 days
2.	<i>Candida albicans</i>	227	25	2 days

*Procured from IMTECH Chandigarh.

EXPERIMENTAL

Preparation of Solution of Standard Drug

A stock solution of Fluconazole (1 mg/ml) was prepared in DMF and further diluted as reported for antibacterial studies.

Preparation of solution of the synthesized compounds

The solutions were prepared in the same way as mentioned under antibacterial screening. All those compounds screened earlier for antibacterial activity were also tested for their antifungal activity. The fungi employed for the screening were *Aspergillus Niger* and *Candida albicans*. Fluconazole (2-(2,4-difluorophenyl)-1,3-di(1H-1,2,4-triazol-1-yl)propan-2-ol) (Figure 5.1) was employed as standard to compare the results. The test organisms were sub-cultured using Potato-DextroseAgar (PDA) medium

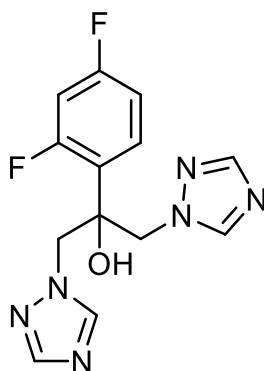


Figure 5.1: Chemical structure of Fluconazole

The tubes containing sterilized medium were inoculated with test fungi and kept at room temperature for obtaining growth. After that, they were stored at 4°C in a refrigerator. The activity of the derivatives was performed by Agar diffusion-based cup plate method at different concentration level. Fluconazole was used as standard drug at concentration remains same. Fluconazole solution prepared at a concentration of 1000 g/ml in sterilized distilled water.

RESULT AND DISCUSSION

Antifungal Activity

The antifungal activity result stated that all synthesized compounds (6A-6F) of isatin-moxifloxacin based 1,2,3-triazole derivatives have shown good to moderate activity against tested organisms and was shown in Table 5.1.

Antifungal activity of synthesized 1,2,3-triazoles derivatives.

COMPOUND	Zone inhibition (mm)			
	<i>C. Albicans</i>		<i>A. Niger</i>	
	50	100	50	100
6A	14.75±0.53	27.65±0.43	23.34±0.28	28.25±0.32
6B	8.32±0.33	12.72±0.34	14.52±0.26	17.64±0.32
6C	16.72±0.34	29.32±0.26	19.62±0.23	29.72±0.18
6D	10.45±0.28	22.20±0.22	22.23±0.43	24.35±0.25
6E	9.22±0.65	25.25±0.34	18.42±0.46	21.55±0.12
6F	9.64±0.88	15.32±0.44	16.65±0.16	20.52±0.12
DMSO (Control)	-	-	-	-
Fluconazole	25.30 ±0.32	30.25±0.26	24.25±0.32	29.20±0.23

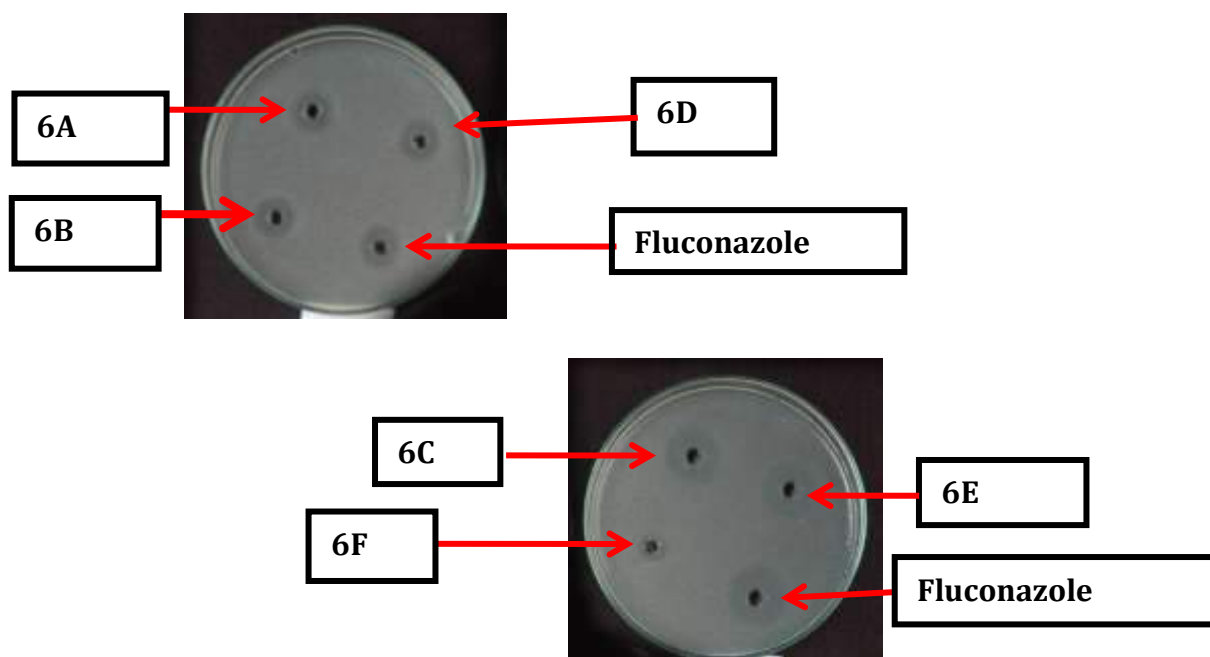


Figure 5.2: Zone inhibition against *C. Albicans*

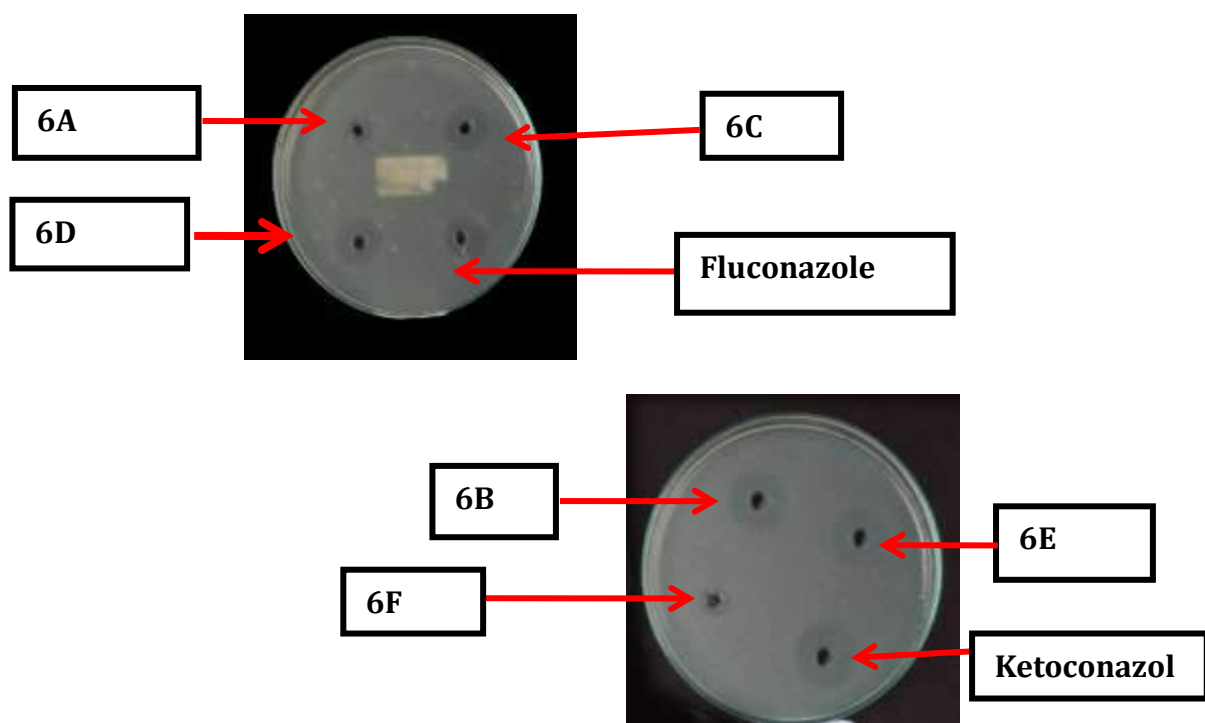


Figure: Zone inhibition against *A. Niger*

Discussion

The six new derivatives of 1,2,3-triazoles derivatives has been synthesized and evaluated for their antifungal activity against two fungal strains using Agar diffusion method. The Fluconazole was used as standard to compare the antifungal potency of the synthesized compounds. The antifungal activity data of 1,2,3-triazoles derivatives (6A-6F) signifies that inhibitory action on fungal strains at 50 μg and 100 μg drug concentration as compared with standard. The compounds 6A and 6C possessed maximum activity in fungal strains.

SUMMARY AND CONCLUSION

The practice of medicinal chemistry is devoted to the discovery and development of new agents for treating disease. Most of the activity in this discipline is directed to the new natural or synthetic organic compounds, organic compounds have a major place in



therapy and they being with increasingly specific pharmacological activities are clearly the dominant force. Thousands of organic chemicals are prepared annually throughout the world, and many of them enter into pharmacological screening to determine if they have useful biological activity. Among these organic chemicals, heterocyclic nucleus containing compounds occupy a major portion.

The thesis work is broadly classified into two section. In this section, detailed methods and procedures for synthesis of various 1,2,3-triazole derivatives along with their purification and physicochemical parameters had given. Literature is flooded with reference to show the efficacy of substituted 1,2,3-triazole with N-(2-azidoethyl)-isatin (1-(2-azidoethyl)-6-substitutedindoline-2,3-dione) and propargyl moxifloxacin was used to synthesized the compound, 1-cyclopropyl-6-fluoro-8-methoxy-7-((4aR,7aR)-1-((1-(2-(6-nitro-2,3-dioxindolin-1-yl)ethyl)-1H-1,2,3-triazol-4-yl)methyl) octahydro-6H-pyrrolo[3,4-b]pyridin-6-yl)-4-oxo-1,4-dihydroquinoline-3-carboxylic acid as potent medicinal agents for various pharmacological activities like antibacterial, antifungal and antitubercular etc.

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SYNTHESIS, CHARACTERIZATION AND ANTIMICROBIAL EVALUATION OF SOME NEW 4(3H)-QUINAZOLINONE

Pankaj Kumar, Arun Patel, Shailendra Patel

Shri Ram Group of Institutions, Faculty of Pharmacy, Jabalpur (M.P.), India

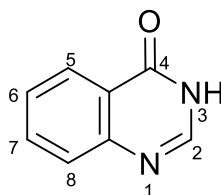
ABSTRACT

Heterocyclic systems comprising quinazolinones have been explored to a major extent in last few decades due to its chemotherapeutic and antimicrobial potential. Quinazolinone is a bicyclic compound containing benzene ring fused with pyrimidine ring. Microbiology is the study of microscopic organisms such as bacteria, viruses, fungi and protozoa. This discipline includes fundamental research on the biochemistry, physiology, cell biology, ecology, evolution and clinical aspects of microorganisms, including the host response to these agents. Bacterial resistance to existing drugs is a growing problem in the world. The antibacterial and antifungal activity data of 2,3-disubstituted 4(3H)-quinazolinone derivatives (6A-6J) indicated that the compounds have significant inhibitory activity on all the bacterial and fungal strains at both 50 µg (0.05 ml) and 100 µg (0.1 ml) dose levels when compared with standard. Among all the compounds tested, compounds 6A, 6B, 6C and 6D possessed maximum activity in both fungal as well as bacterial strains. These compounds possessed the halogens on the aromatic ring and thus reveal the positive contribution of electron withdrawing groups to the antibacterial activity.

INTRODUCTION

The word 'drug' is derived from the French word *drogue*, which means a dry herb. In a general way, a drug may be defined as a substance used in prevention, diagnosis, treatment or cure of disease in man or animals. Fighting diseases with drugs is the timeless struggle [1]. So are the search drugs to combat them. In the earliest days of civilization man was totally dependent on nature not only for food but also for treatment of various diseases. He used the plants around him for treating ailments. At a time thousands of acres of land is required for growing plants such as Indigo and Turkey red. Organic chemical research showed how to synthesize these dyes from coal-tar and thus released this land for other productive uses. In many cases the synthetic materials are superior to the natural compound e.g. synthetic dyes are superior to those obtained from natural origin. In other case, the synthetic materials are entirely unknown in nature and fill the requirements not satisfied from any other source [2]. Examples are ether, glycol, aspirin, and sulpha drugs. Synthetic organic chemistry touches almost every phase of life.

Heterocyclic compound can be aliphatic or aromatic in character depending upon the electronic constitution. The atoms of a simple heterocyclic ring are numbered from the heteroatom which is counted as one [5]. Substituent's are given the lowest possible numbers and then arranged in alphabetical order viz. quinazolinone the nucleus of present study is numbered as follows:



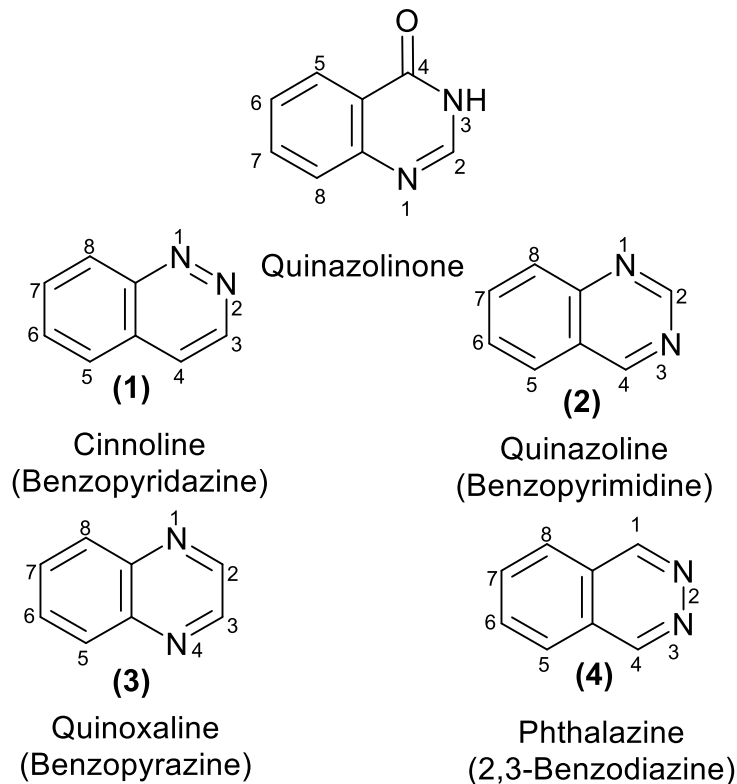
Quinazolinone

Quinazolin-4(3H)-one is a versatile pharmacophore which exhibits wide variety of biological activities like hypnotic, antitussive, analgesic, muscle relaxant, anticonvulsant, antiallergic, antibacterial, hypoglycemic and antispasmodic [6-10].

An important quinazolin-4(3H)-one is 2-methyl-3-*o*-tolyl-4(3H)-quinazolinone known as methaqualone [11] is a potent sedative-hypnotic (non-barbiturate) introduced in 1965. The marketed product of this quinazolinone in U.S.A. is Quaalude^(R), iparset^(R) and sopor^(R) in the form of HCl salt.



Quinazoline is a compound in which pyrimidine fused with benzene and is called benzopyrimidine. Since N^+ and C are isoelectronic, the simplest and most direct hetero analogue of benzene is the pyrimidinium ion. There are several examples of benzene fused with six membered ring containing two nitrogen atoms. Some of the examples are benzodiazines (cinnoline, phthalazine, quinoxaline, quinazoline). Quinazoline or benzopyrimidine is the fused pyrimidine with benzene [12].



Depending upon the position of the keto or oxo group, Quinazolinone compounds may be classified into two types: 2-(1H)quinazolinone or 1,2-dihydro-2-oxoquinazolines and 4(3H)-quinazolines or 3,4-dihydro oxoquinazolines. These system exhibit lactam-lactim tautomerism and undergo hydroxy group replacement reactions.

Worldwide literature survey indicates that infectious diseases can be cured using the traditional system of medication which is highly acknowledged and considered to be one of the primary systems of healthcare management. Prehistoric pieces of evidence from the age of Neanderthal men, historical documentation of ancient civilizations, age-old practices of ethnomedicine and modern clinical research all have represented the curative potential of plants in the form of extracts or other alternative forms of medical treatments [28].

Throughout the globe, natural therapeutics came into demand in the late 1990s and eventually opened a new branch of research, entitled as complementary and alternative medicine (CAM) with lesser side effects, broad-spectrum activity against a number of ailments, high tolerability, low toxicity level, lower cost and great enough pharmacokinetics to be clinically effective without chemical change and/or alteration [29].

Currently, more than 80% of the world's population is significantly relying on conventional plant based pharmaceutical products as therapeutics to address a wide array of human medical conditions [30]. Undoubtedly, the interest in searching new drugs from plant source has been tremendously increasing among researchers around the globe. Several plant secondary metabolites for example flavonoids, tannins, alkaloids, anthocyanidin glycosides, essential oils, and terpenoids, have been reported to have significant antimicrobial activity [31]. Several research groups from various parts of the world have reported that various plant species possessing significant antimicrobial properties [32] through in-silico, in-vitro and/or in-vivo experimental settings [33].

Undoubtedly antibiotic drug resistance (ADR) and/or antimicrobial resistance (AMR) is accepted as one of the major challenges of the 21st century by every apex economic, political and regulatory bodies including the International Monetary Fund (IMF), the World Bank (WB), the World Health Organization (WHO), and the Group of Eight (G8). AMR imposes the greatest major problems and challenges



to the public health threat (chemotherapeutic failure), social, animal health and environmental concern/crises imposing a serious real global issue [34].

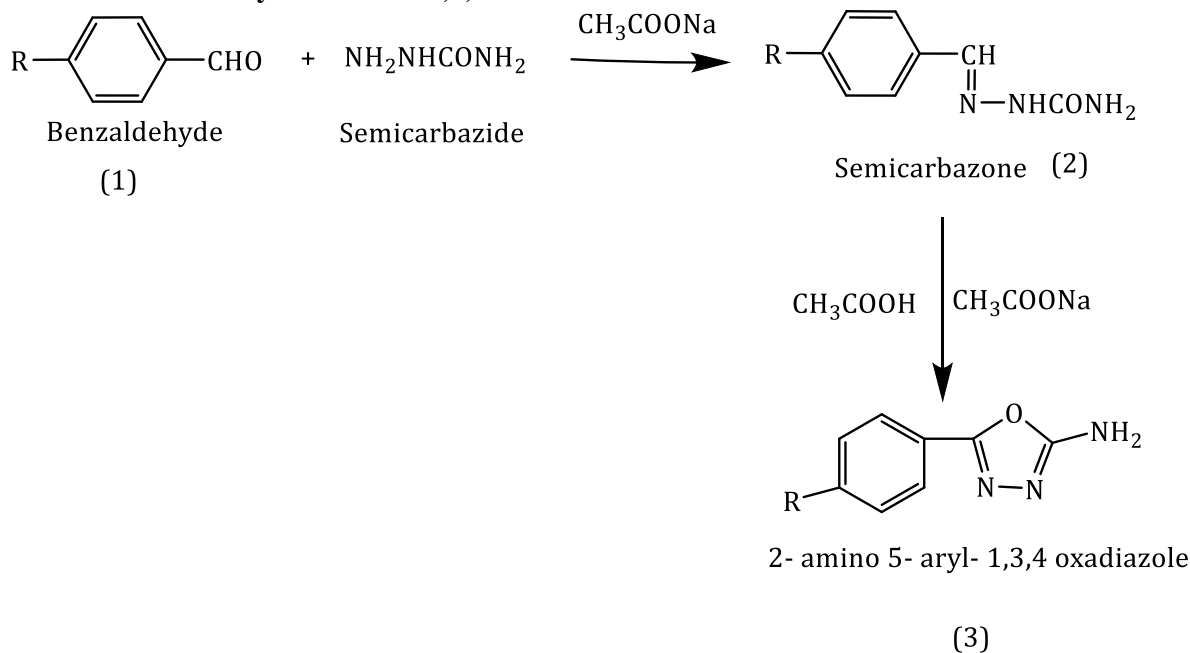
Therefore, the AMR problem is presently viewed by two parallel holistic and multidisciplinary principles, One Health and Global Health, which were used in general to address problems associated with infectious disease, and AMR in particular. According to new figures, the number of people that die each year because of AR infections or AMR is approximately 700,000 and it is anticipated that it will spike to 10 million people each year by 2050 at a global scale [35]. This relationship indicates that public health and animal health are mutually dependent on each other and the environment in which they live in particular.

The antibiotic resistance (AR) motivated the researchers and biopharmaceutical industries to come up with new classes of antibiotics. However, there has been a rapid decline in the global funding and investment for research to the advancement of novel antibiotics by the growing biotechnology industry and pharmaceutical companies and government guidelines and regulations impacting the speed of translational research [36]. Decision-makers, regulators and many organizations accept the global public health consequences of a deteriorating antibiotic drug discovery and development pipeline. However, with an expected rejection rate of 95% [37], it is a known fact that it is a very challenging and tedious task to develop a new antibiotic. Moreover, new antibiotic development costs billions of US dollars.

MATERIALS AND METHODS

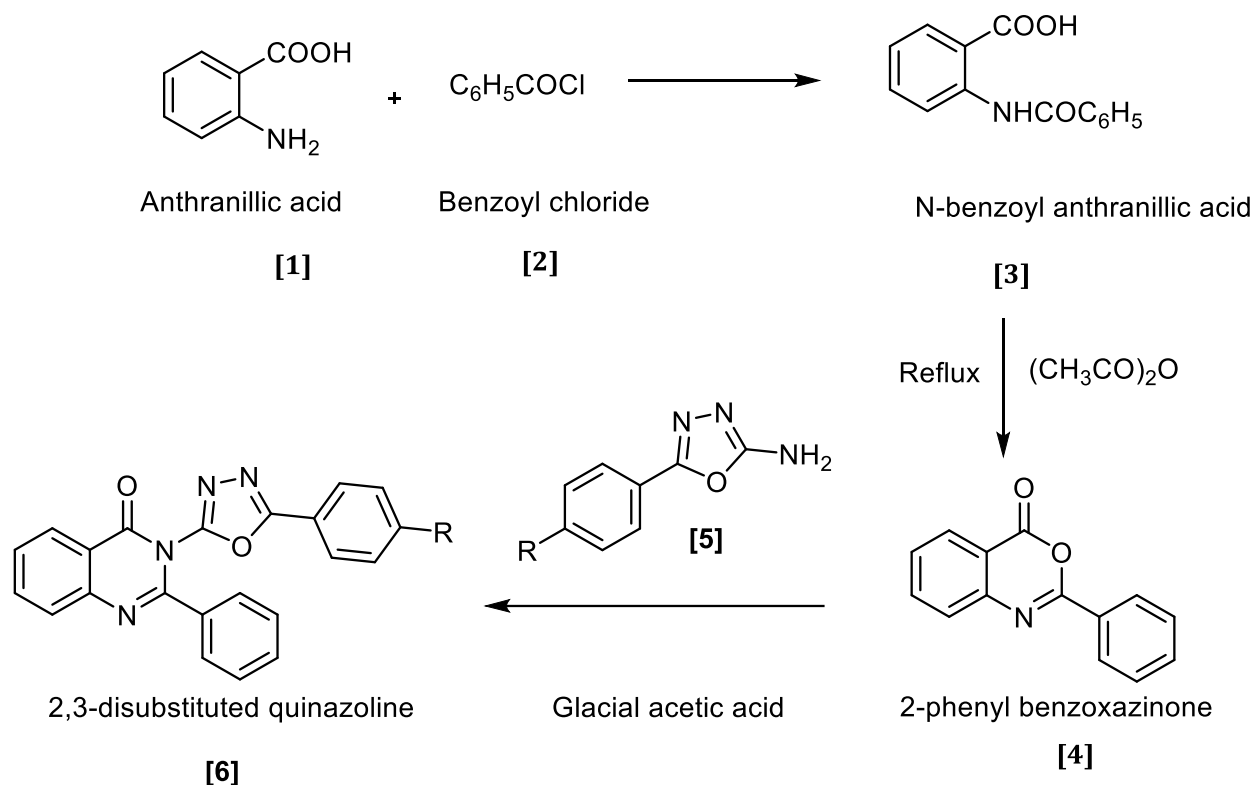
SCHEME FOR SYNTHESIS

(a) Synthesis of 2-amino-5-arylsubstituted-1,3,4-oxadiazole





(b) Synthesis scheme of title compounds (2,3-disubstituted quinazoline)



The synthesized compounds are

Compound 6A: 3-(5-(4-chlorophenyl)-1,3,4-oxadiazol-2-yl)-2-phenylquinazolin-4(3H)-one

Compound 6B: 3-(5-(4-bromophenyl)-1,3,4-oxadiazol-2-yl)-2-phenylquinazolin-4(3H)-one

Compound 6C: 3-(5-(4-nitrophenyl)-1,3,4-oxadiazol-2-yl)-2-phenylquinazolin-4(3H)-one

Compound 6D: 2-phenyl-3-(5-(p-tolyl)-1,3,4-oxadiazol-2-yl)quinazolin-4(3H)-one

Compound 6E: 3-(5-(4-methoxyphenyl)-1,3,4-oxadiazol-2-yl)-2-phenylquinazolin-4(3H)-one

Compound 6F: 3-(5-(4-ethylphenyl)-1,3,4-oxadiazol-2-yl)-2-phenylquinazolin-4(3H)-one

Compound 6G: 3-(5-(4-ethoxyphenyl)-1,3,4-oxadiazol-2-yl)-2-phenylquinazolin-4(3H)-one

Compound 6H: 3-(5-(2-chlorophenyl)-1,3,4-oxadiazol-2-yl)-2-phenylquinazolin-4(3H)-one

Compound 6I: 3-(5-(2-bromophenyl)-1,3,4-oxadiazol-2-yl)-2-phenylquinazolin-4(3H)-one

Compound 6J: 3-(5-(2-nitrophenyl)-1,3,4-oxadiazol-2-yl)-2-phenylquinazolin-4(3H)-one

All the compounds were synthesized with good yields and purity. The compounds were characterized by subjecting to various spectral studies such as IR and ^1H NMR etc.



PHYSICO-CHEMICAL CHARACTERIZATION

Physical parameters of the compounds

Comp.	Mol. Formula	Mol. wt.	% Yield	Physical Appearance		Melting Point (°C)	R _f value
				Color	State		
6A	C ₂₂ H ₁₃ ClN ₄ O ₂	400.82	76	Shiny white	Solid	270-272°C	
6B	C ₂₂ H ₁₃ BrN ₄ O ₂	445.28	56	Off white	Solid	243-245°C	
6C	C ₂₂ H ₁₃ N ₅ O ₄	411.38	78	Yellow	Solid	260-262°C	
6D	C ₂₃ H ₁₆ N ₄ O ₂	380.41	70	Cream	Solid	176-178°C	
6E	C ₂₃ H ₁₆ N ₄ O ₃	396.41	68	Cream	Solid	166-268°C	
6F	C ₂₄ H ₁₈ N ₄ O ₂	394.43	65	Light brown	Solid	233-235°C	
6G	C ₂₄ H ₁₈ N ₄ O ₃	410.43	62	Off grey	Solid	213-215°C	
6H	C ₂₂ H ₁₃ ClN ₄ O ₂	400.82	55	Shiny white	Solid	255-257°C	
6I	C ₂₂ H ₁₃ BrN ₄ O ₂	445.28	48	Yellow	Solid	248-250°C	
6J	C ₂₂ H ₁₃ N ₅ O ₄	411.38	68	Off white	Solid	250-252°C	

6.3 Solubility studies of the synthesized compounds

Compound	Water	Alcohol	Acetone	Glacial Acetic Acid	Benzene	Dimethyl Sulfoxide
6A	-	+++	+	++	-	++
6B	-	+++	+	++	-	++
6C	-	+++	+	++	-	++
6D	-	+++	+	++	-	++
6E	-	+++	+	++	-	++
6F	-	+++	+	++	-	++
6G	-	+++	+	++	-	++
6H	-	+++	+	++	-	++
6I	-	+++	+	++	-	++
6J	-	+++	+	++	-	++

- Insoluble; + = Slightly soluble; ++ = soluble; +++ = Freely soluble

Agar Diffusion Method

This method gives the extent of growth of the microorganism, inoculated into a solid nutrient agar bed by the antimicrobial substance. The test substance is kept in a cup made of agar bed, diffuses into it and inhibits the growth of microorganism. The diameter of the zone of inhibition is measured in comparison with suitable drug substance, is considered as potency of that substance. The diameter of zone of inhibition is directly proportional to the concentration of the drug substances added into the cup, thickness of the agar bed, diffusion coefficient of the antimicrobial substance into the agar cup, sensitivity of the microorganism to the test substance and the temperature. The appropriate media is sterilized and cooled to 42°C, incubated with the test organism, mixed uniformly and poured into petri plates and cooled. Bores are made into it; specified test solution is added and left at room temperature for 30 min. Incubate at 37°C for 24 hrs. The zone of inhibition is measured in mm [29].

Antibacterial screening of the synthesized compounds

For the anti-bacterial screening of the synthesized compounds the two gram-negative bacterial species were taken and enlisted in Table 5.1.

Table 1: List of Bacterial strains

S. No.	Microbial strains	MTCC No.*	Strain (Gram +/-)	Incubation Temp.	Incubation period
1.	<i>Pseudomonas Aeruginosa</i>	424	-ve	37	24h
2.	<i>Escherichia Coli</i>	40	-ve	37	24h

*Procured from IMTECH Chandigarh.

Antibacterial Activity

The synthesized 2,3-disubstituted 4(3H) quinazolinone derivatives were screened for the antibacterial activity against two Gram-negative bacteria viz., *Escherichiacoli* and *Pseudomonasaeruginosa* by using the Agar diffusion method. Ciprofloxacin was used as reference standard for comparing the synthesized compounds for its efficacy.



Culture medium: Nutrient broth was used for the preparation of inoculum of the bacteria and nutrient agar was used for the screening method.

Composition of Nutrient Agar Medium

- | | |
|--------------------------|---------|
| a) Peptone | 5.0 gm |
| b) Sodium chloride | 5.0 gm |
| c) Beef extract | 1.5 gm |
| d) Yeast extract | 1.5 gm |
| e) Agar | 15.0 gm |
| f) Distilled water (q.s) | 1000 ml |
| g) pH (7.4±0.2) | |

The test organisms were subcultured using nutrient agar medium. The tubes containing sterilized medium were inoculated with the respective bacterial strain. After incubation at 37°C ±1°C for 18 hours, they were stored in a refrigerator. The nutrient agar medium was sterilized by autoclaving at 121°C (15 lb/sq.inch) for 15 min. The petriplates, tubes and flasks plugged with cotton were sterilized in hot-air oven at 160°C, for an hour. Into each sterilized petriplate (20 cm diameter), was poured about 125ml of molten nutrient agar medium which was already inoculated with the respective strain of bacteria (5 ml of inoculum to 250 ml of nutrient agar medium) aseptically. The plates were left at room temperature aseptically to allow the solidification. After solidification, the cups of each of 7 mm diameter were made by scooping out medium with a sterilized cork borer from a petridish and labeled accordingly.

Antifungal screening of the Synthesized Compounds

For antifungal screening the following fungal species were used (Table 5.2).

Table 2: List of Fungal Strains

S. No.	Fungal strain	MTCC* No.	Incubation Temperature (°C)	Incubation period
1.	<i>Aspergillus Niger</i>	281	25	5 days
2.	<i>Candida albicans</i>	227	25	2 days

*Procured from IMTECH Chandigarh.

RESULT AND DISCUSSION

Antibacterial Activity

In accordance with the data obtained from antibacterial activity, all the synthesized 2,3-disubstitued 4(3H)-quinazolinone (6A-6J) have showed activity against tested organisms. Antibacterial activity of the synthesized compounds has been carried out for gram-negative bacterial strain.

Antibacterial Activity Against Gram Negative Bacteria

The Data of antibacterial activity against the gram- negative bacterial strains (*Escherichia Coli* and *Pseudomonasaeruginosa*) suggested the order of activity of compounds: 6A > 6C > 6B > 6D > 6F > 6E > 6G > 6H > 6J > 6I.

Antibacterial activity of synthesized 2,3-disubstitued 4(3H) quinazolinone derivatives against gram negative bacteria.

S. No.	COMPOUND	Zone of inhibition in mm			
		<i>Pseudomonas Aeruginosa</i>		<i>Escherichia coli</i>	
		50µg	100µg	50µg	100µg
1.	6A	19.05±0.21	22.11±0.25	18.07±0.26	20.02±0.21
2.	6B	16.28±0.28	19.24±0.25	15.32±0.27	18.25±0.28
3.	6C	18.28±0.24	21.28±0.28	17.30±0.22	19.25±0.24
4.	6D	14.05±0.24	16.10±0.22	13.09±0.23	15.02±0.24
5.	6E	12.57±0.26	14.59±0.23	11.61±0.27	13.54±0.28
6.	6F	13.57±0.25	15.54±0.26	12.56±0.23	14.54±0.23
7.	6G	11.67±0.24	12.64±0.29	10.71±0.23	12.64±0.24
8.	6H	08.45±0.23	10.46±0.26	07.49±0.22	09.42±0.23
9.	6I	07.15±0.27	09.19±0.27	06.19±0.27	08.12±0.22
10.	6J	09.31±0.23	09.52±0.23	07.35±0.25	09.28±0.22
11.	Ciprofloxacin	19.28±0.36	23.45±0.23	19.70±0.65	22.65±0.26

The order of activity of synthesized compound is: 6A > 6C > 6B > 6D > 6F > 6E > 6G > 6H > 6J > 6I

Compounds 6A (18.07±0.26), 6B (15.32±0.27), 6C (17.30±0.22), 6D (13.09±0.23), 6E (11.61±0.27), 6F (12.56±0.23), 6G (10.71±0.23), 6H (07.49±0.22), 6I (6.19±0.27) and 6J (07.35±0.23) has shown zone of inhibition (mm) in comparison to standard drug (Ciprofloxacin, 19.70±0.65) has shown good activity against *Escherichia coli* (gram negative bacteria) at 50µg concentration.

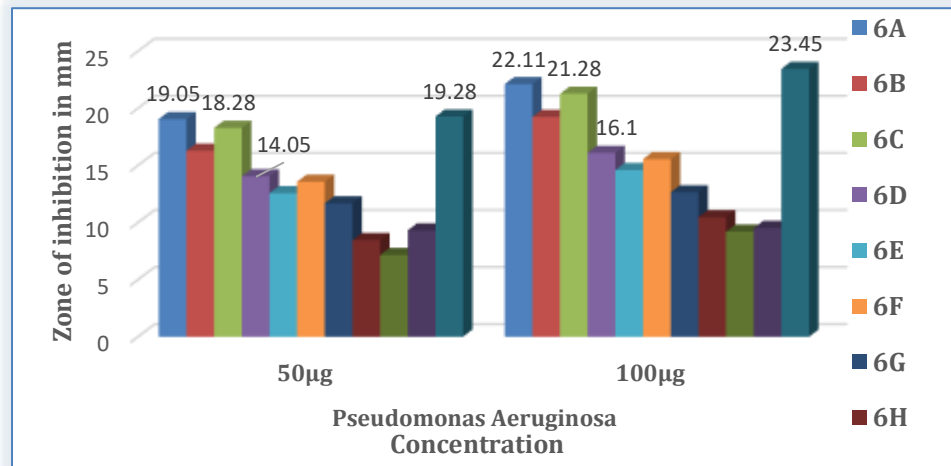


Figure 1: Graph showing Zone of inhibition of the synthesized derivatives against gram negative bacteria.

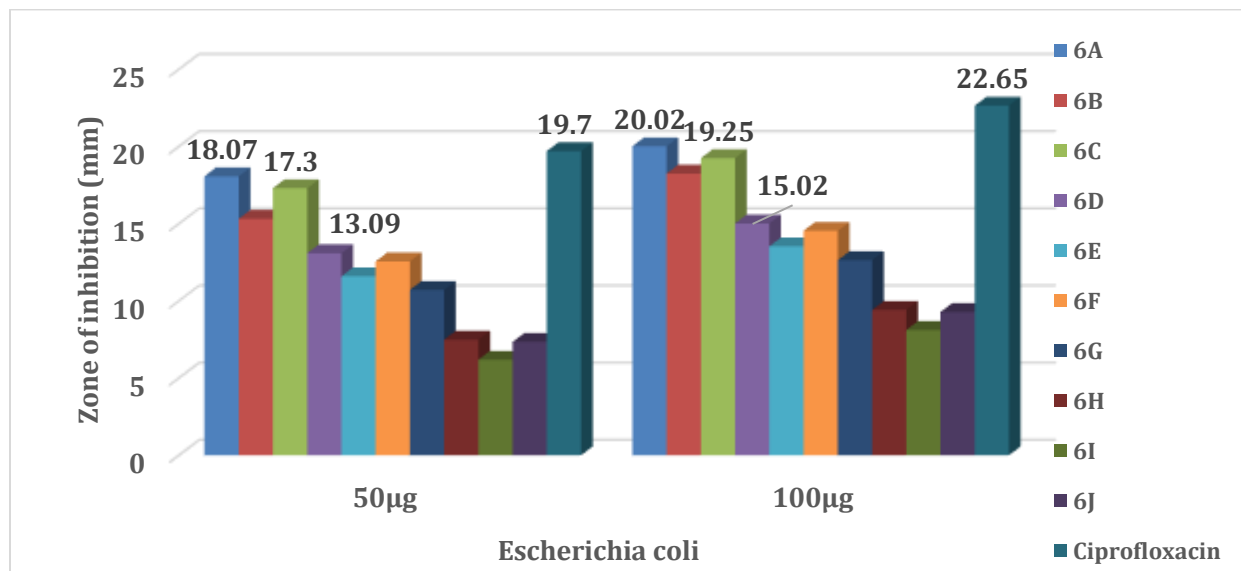


Figure 4: Graph showing Zone of inhibition of the synthesized derivatives against gram negative bacteria.

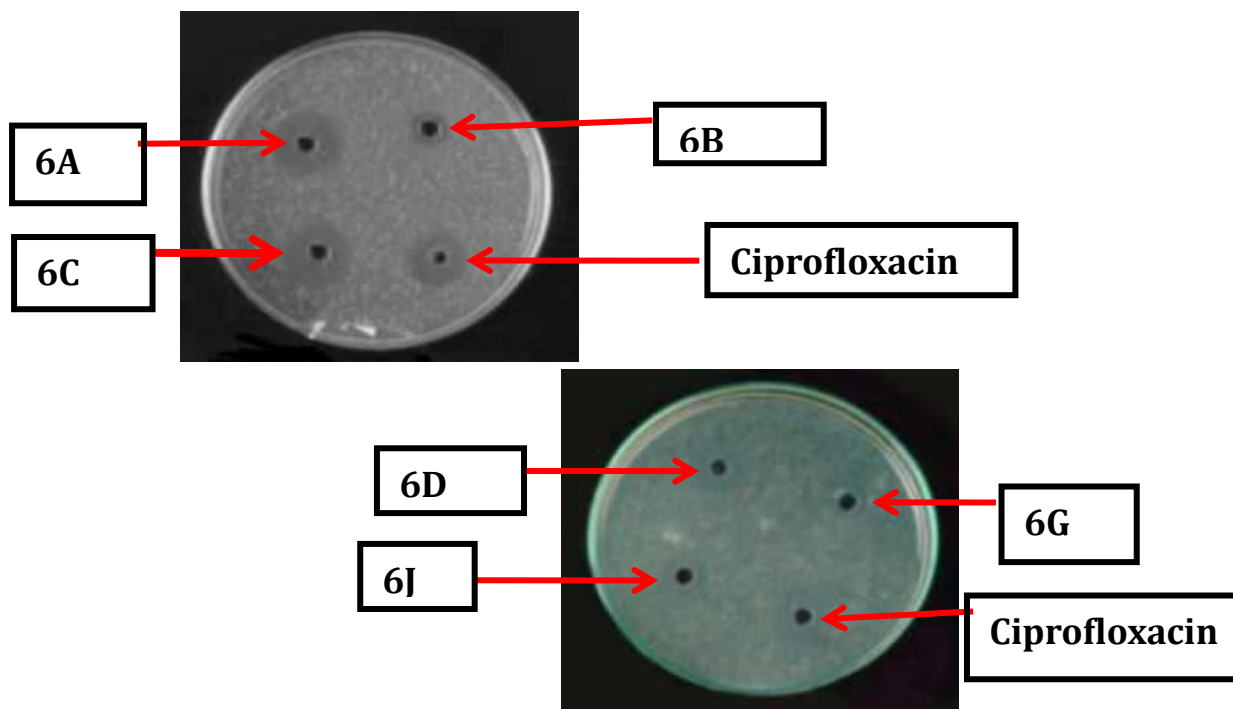


Figure 5: Zone of inhibition of synthesized derivatives against *Pseudomonas Aeruginosa*

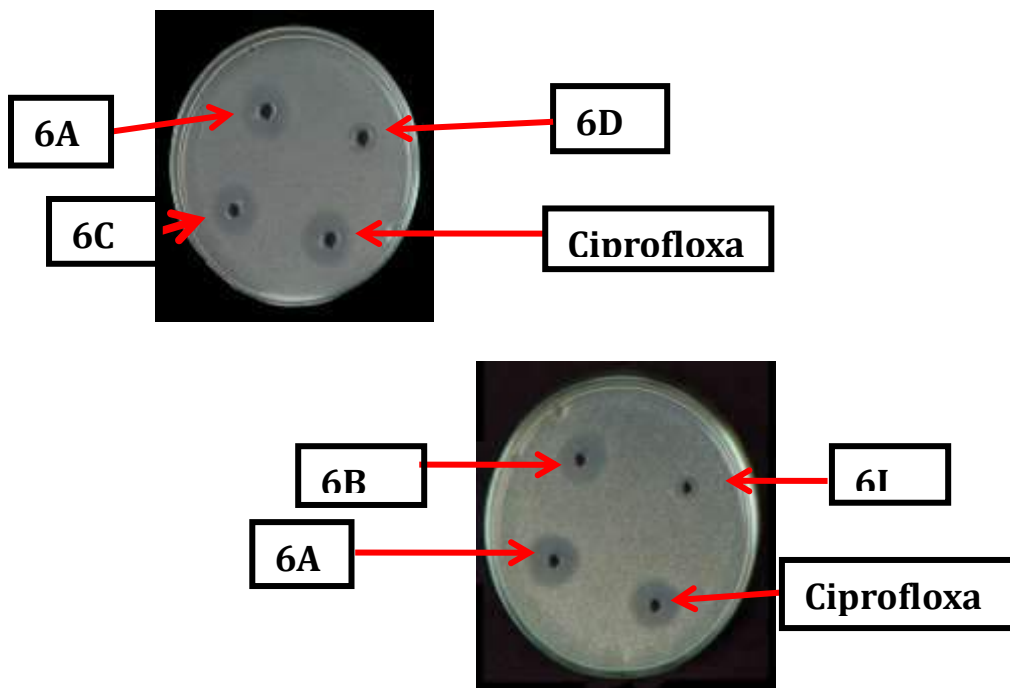


Figure 6: Zone of inhibition of synthesized derivatives against *Escherichia Coli*



Antifungal Activity of Synthesized 2,3-Disubstituted 4(3H) Quinazolinone Derivatives.

COMPOUND	Zone of inhibition (mm)			
	<i>C. Albicans</i>		<i>A. Niger</i>	
Concentration	50	100	50	100
6A	24.75±0.53	27.65±0.43	23.34±0.28	28.25±0.32
6B	21.72±0.34	22.20±0.22	19.62±0.23	26.72±0.18
6C	22.45±0.28	26.32±0.26	22.23±0.43	26.35±0.25
6D	21.22±0.65	25.25±0.34	18.42±0.46	22.55±0.12
6E	16.42±0.67	22.72±0.27	18.52±0.25	24.32±0.14
6F	15.32±0.32	18.25±0.45	20.38±0.14	24.42±0.25
6G	14.62±0.72	17.62±0.23	17.24±0.13	22.52±0.22
6H	8.32±0.33	12.72±0.34	14.52±0.26	17.64±0.32
6I	6.32±0.84	11.12±0.25	15.65±0.12	19.22±0.14
6J	10.32±0.88	15.32±0.44	16.65±0.16	20.52±0.12
DMSO (Control)	-	-	-	-
Fluconazole	25.30±0.32	30.25±0.26	24.25±0.32	29.20±0.23

The order of the activity: 6A>6B>6C>6D>6E>6F>6G>6J>6H>6I

Compounds 6A (27.65±0.43), 6B (22.20±0.22), 6C (26.32±0.26), 6D (25.25±0.34), 6E (22.72±0.27), 6F (18.25±0.45), 6G (17.62±0.23), 6H (12.72±0.34), 6I (11.12±0.25) and 6J (15.32±0.44) has shown zone of inhibition (mm) as compared to standard drug (Fluconazole, 30.25±0.26) has shown good activity against *C. Albicans* (Fungi strains) at 100 µg concentration.

However, further studies on activity and long term toxicity are to be carried out before any conclusion are drawn, as these categories of drug are known to have potential antimicrobial activity. Testing on different models can further substantiate the antimicrobial activity of the synthesized analogues. The graphical representation of antifungal activity on fungus strains was shown in Figure 5.7 & 5.8 and zone of inhibition was shown in Figure 5.9 & 5.10. Antibacterial and antifungal activities of the 2,3-disubstituted 4(3H)-quinazolinone are mostly widely used and some of them are in clinical practice as antimicrobial agents. In particular 2,3-disubstituted 4(3H)-quinazolinone derivatives in recent years are extensively studied for the development of newer antimicrobial agents.

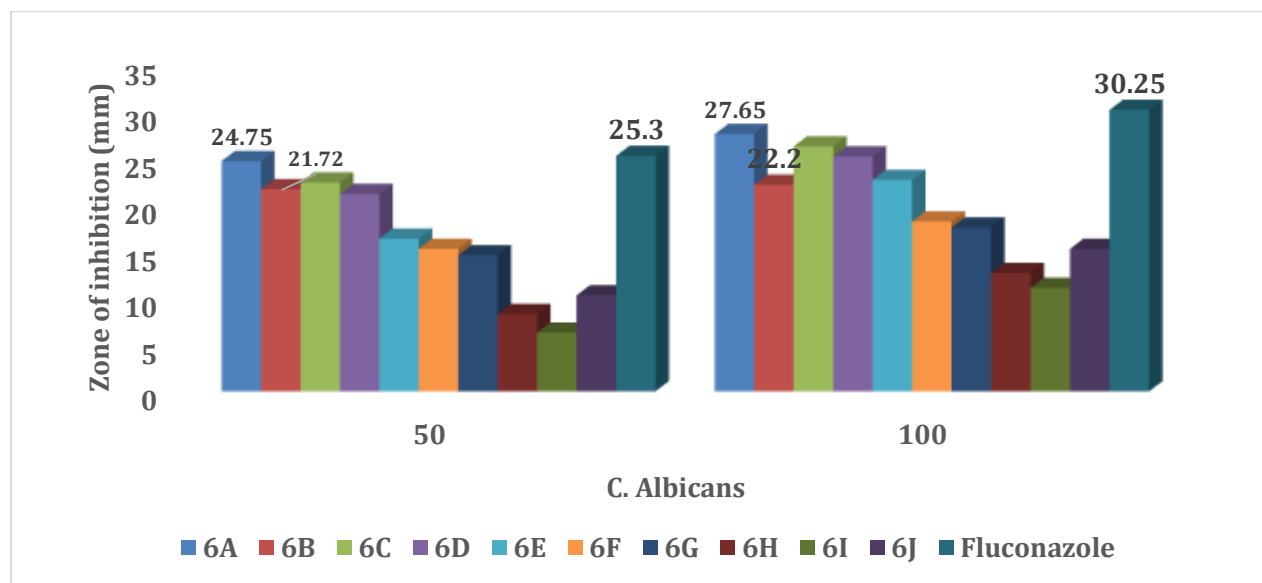


Figure 7: Graph showing Zone of inhibition of the synthesized derivatives against *C. Albicans* fungi.

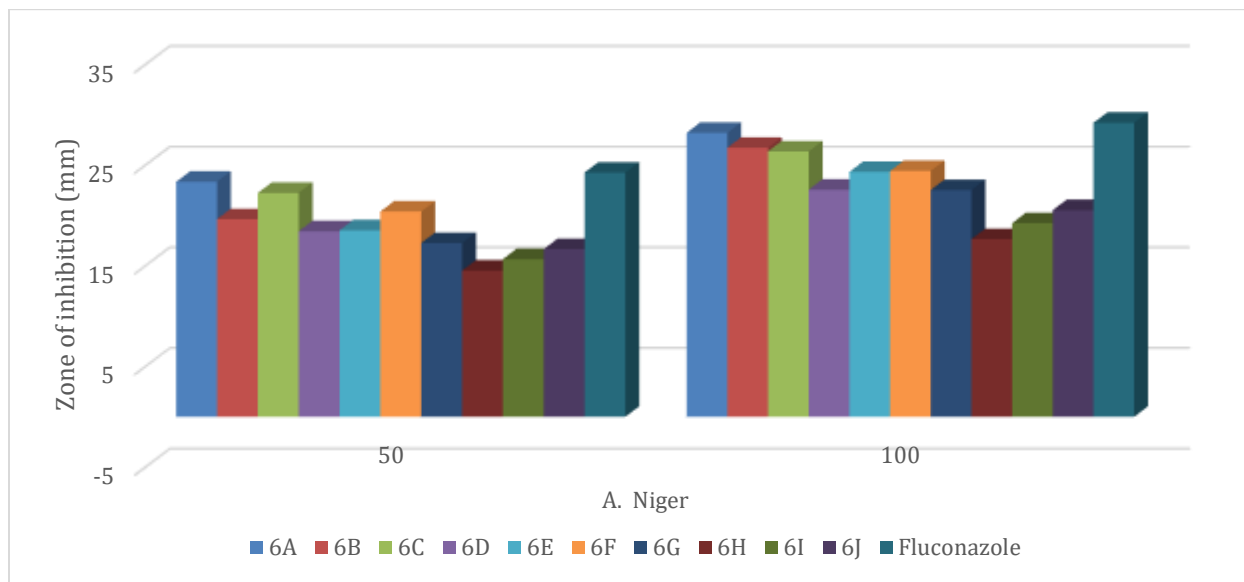


Figure 8: Graph showing Zone of inhibition of the synthesized derivatives against *A. Niger* fungi.

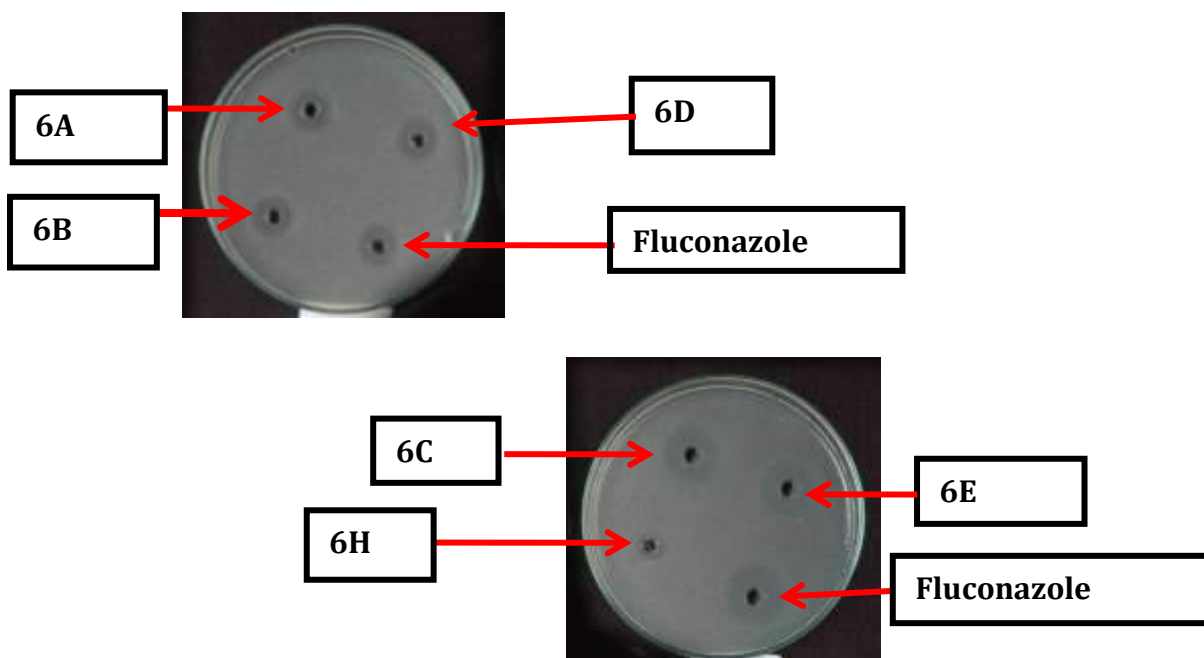


Figure 9: Zone of inhibition of synthesized derivatives against *C. Albicans*

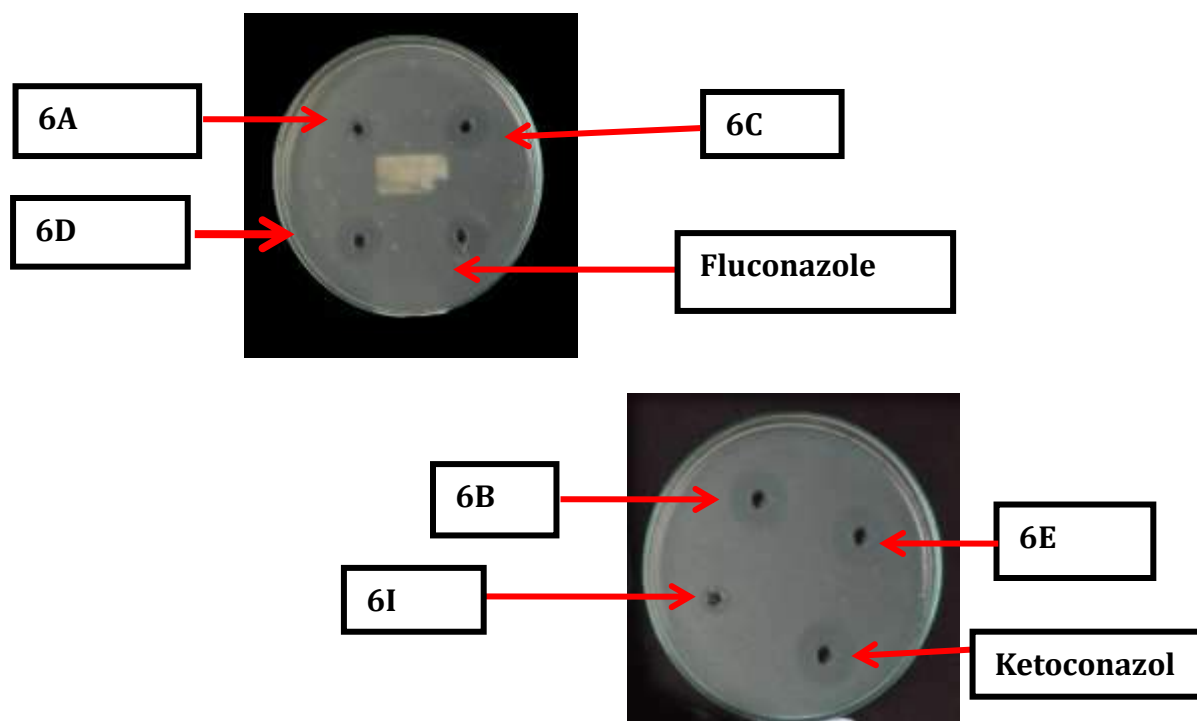


Figure 10: Zone of inhibition of synthesized derivatives against *A. Niger*

DISCUSSION AND CONCLUSION

The ten new derivatives of 2,3-disubstituted 4(3H)-quinazolinone has been prepared and evaluated for their antibacterial activity against Gram-negative bacterial strains and two fungal strains are used to carried out antifungal activity using Agar diffusion method. The Ciprofloxacin used as standard for antibacterial activity and Fluconazole was used as standard to compare the antifungal potential of the synthesized compounds.

The antibacterial and antifungal activity data of 2,3-disubstituted 4(3H)-quinazolinone derivatives (6A-6J) indicated that the compounds have significant inhibitory activity on all the bacterial and fungal strains at both 50 µg (0.05 ml) and 100 µg (0.1 ml) dose levels when compared with standard. Among all the compounds tested, compounds 6A, 6B, 6C and 6D possessed maximum activity in both fungal as well as bacterial strains. These compounds possessed the halogens on the aromatic ring and thus reveal the positive contribution of electron withdrawing groups to the antibacterial activity.

Presence of electronegative group (Br, Cl, and NO₂) with para substitution either at 5th position along with the 1,3,5-oxadiazole at 3 position in the quinazolinone is essential for the antifungal and antibacterial activity but in case of ortho substitution may diminish the activity.

The ten new derivatives of 2,3-disubstituted 4(3H)-quinazolinone has been synthesized and characterized by IR spectrophotometric analysis and ¹HNMR. The synthesized compounds have shown the characteristic peaks of 3082.54 (Ar. C-H); 1766.96 (C=O str.); 1607.10 (C=N str.); 1589.64 (C-C str.); 1522.91 (C=C str.); 1250 (C-N sym. str.); 1520 (C=N str.); 1089.3 (C-O of 1,3,4-oxadiazole nucleus), 1621.2 (C=N of 1,3,4-oxadiazole nucleus), 647.0 (C-Cl), 620 (C-Br), 1493.51 (N-O asym. str.) and 1382 (sym. N=O str.). ¹HNMR spectrum of the synthesized compounds has shown the peaks at ppm 7.53-7.71 (2H, Ar. C-H, 1,3,4-oxadiazole); 7.49-7.78 (2H, Ar. C-H, phenyl ring); 7.68-8.13 (4H, Ar. C-H). 1.18 (3H, -CH₃); 2.49-2.51 (3H, -CH₃); 3.314 (2H, -OCH₂) 3.81 (3H, -OCH₃). Thin layer chromatography was performed for every individual process and has shown the Retention factor less than 0.7. These all the characterized parameter depicted that compound were synthesized as per expected and confirmed by the IR and ¹HNMR analysis.

The ten new derivatives of 2,3-disubstituted 4(3H)-quinazolinone has been prepared and evaluated for their antibacterial activity against Gram-negative bacterial strains and two fungal strains are used to carried out antifungal activity using Agar diffusion method. The Ciprofloxacin used as standard for antibacterial activity and Fluconazole was used as standard to compare the antifungal potential of the synthesized compounds.



The antibacterial and antifungal activity data of 2,3-disubstituted 4(3H)-quinazolinone derivatives (6A-6J) indicated that the compounds have significant inhibitory activity on all the bacterial and fungal strains at both 50 µg (0.05 ml) and 100 µg (0.1 ml) dose levels when compared with standard. Among all the compounds tested, compounds 6A, 6B, 6C and 6D possessed maximum activity in both fungal as well as bacterial strains. These compounds possessed the halogens on the aromatic ring and thus reveal the positive contribution of electron withdrawing groups to the antibacterial activity.

Presence of electronegative group (Br, Cl, and NO₂) with para substitution either at 5th position along with the 1,3,5-oxadiazole at 3 position in the quinazolinone is essential for the antifungal and antibacterial activity but in case of ortho substitution may diminish the activity. The research work established the fact that 2, 3, -disubstituted quinazolinone-4-(3H) can be further studied for their variety of pharmacological activities.

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THE ROLE OF ARTIFICIAL INTELLIGENCE IN PERSONALIZED MARKETING

Kavita Rani

MMIM, Maharishi Markandeshwar Deemed to be University Mullana, Ambala, Haryana, India

ABSTRACT

Artificial Intelligence (AI) is revolutionizing personalized marketing by enabling businesses to analyze vast amounts of data and deliver tailored experiences to individual customers at scale. This paper explores the multifaceted role of AI in personalized marketing, examining its applications, benefits, challenges, and future implications. Through a synthesis of academic research, industry insights, and case studies, this paper provides a comprehensive overview of how AI is reshaping the landscape of marketing personalization and offers strategic recommendations for businesses seeking to harness its potential.

1. INTRODUCTION

- Overview of personalized marketing and its importance in contemporary business environments.
- Introduction to Artificial Intelligence and its relevance to marketing.
- Thesis statement outlining the role of AI in enabling personalized marketing strategies.

2. UNDERSTANDING AI IN PERSONALIZED MARKETING

- Definition of AI and its subfields pertinent to marketing (e.g., machine learning, natural language processing).
- Explanation of how AI enables the analysis of large datasets to extract actionable insights about customer preferences, behaviors, and intents.
- Overview of AI-powered tools and techniques commonly used in personalized marketing campaigns.

3. APPLICATIONS OF AI IN PERSONALIZED MARKETING

- Customer Segmentation: AI algorithms can identify distinct customer segments based on demographics, behaviors, and psychographics, allowing marketers to tailor messaging and offers to specific audience segments.
- Predictive Analytics: AI-powered predictive models forecast future customer behaviors, such as purchase likelihood or churn probability, enabling marketers to proactively address customer needs and preferences.
- Dynamic Content Generation: AI algorithms dynamically generate personalized content, including emails, ads, and product recommendations, based on individual user attributes and interactions.
- Personalized Recommendations: AI-driven recommendation engines analyze customer data to suggest relevant products, services, or content, enhancing the customer's shopping or browsing experience.
- Real-time Marketing Automation: AI facilitates real-time decision-making in marketing campaigns, enabling automatic

adjustments to messaging, targeting, and bidding based on changing customer behavior and market dynamics.

4. BENEFITS OF AI-POWERED PERSONALIZED MARKETING

- Enhanced Customer Experience: Personalized marketing creates tailored experiences that resonate with individual customers, increasing engagement, satisfaction, and brand loyalty.
- Improved Marketing Effectiveness: AI-driven insights enable marketers to deliver more relevant and timely messages, resulting in higher conversion rates, sales, and return on investment (ROI).
- Scalability and Efficiency: AI automates repetitive tasks and processes, allowing marketers to scale personalized marketing efforts across large customer bases without sacrificing efficiency.
- Competitive Advantage: Businesses that leverage AI for personalized marketing gain a competitive edge by delivering superior customer experiences and staying ahead of evolving consumer preferences.

5. CHALLENGES AND CONSIDERATIONS

- Data Privacy and Ethical Concerns: AI-driven personalization raises privacy issues related to data collection, usage, and consent, necessitating robust data governance and compliance measures.
- Data Quality and Integration: Ensuring the accuracy, completeness, and consistency of data inputs is essential for AI algorithms to generate reliable insights and recommendations.
- Skill Gap and Talent Acquisition: Organizations may face challenges in recruiting and retaining talent with the necessary expertise in AI, data science, and marketing.
- Integration with Existing Systems: Integrating AI-powered marketing solutions with existing IT infrastructure and marketing technologies requires careful planning and coordination.



- Cost and ROI: Implementing AI initiatives entails significant upfront investments in technology, talent, and training, necessitating a clear understanding of the expected return on investment.

6. FUTURE TRENDS AND OUTLOOK

- Advancements in AI Technologies: Continued advancements in AI, including deep learning, reinforcement learning, and unsupervised learning, will further enhance the capabilities and accuracy of personalized marketing systems.

- Hyper-personalization: AI will enable hyper-personalized marketing experiences that go beyond traditional segmentation, delivering individualized messages, products, and services tailored to each customer's unique preferences and context.

- Ethical AI and Transparency: Increasing emphasis will be placed on ethical AI practices, transparency, and accountability in personalized marketing to build trust and mitigate risks associated with algorithmic bias and discrimination.

- Augmented Intelligence: The future of personalized marketing lies in the symbiotic relationship between humans and AI, where AI augments human creativity, decision-making, and strategic planning, rather than replacing human input entirely.

CONCLUSION

- Recap of key insights regarding the role of AI in personalized marketing.

- Emphasis on the transformative potential of AI to revolutionize marketing personalization and drive business success.

- Recommendations for businesses to embrace AI-powered personalized marketing strategies while addressing associated challenges and considerations.

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ATTITUDE OF PARENT'S TOWARDS THEIR MENTALLY RETARDED CHILDREN

Mrs. Bhagyashree Nayak

M.sc.(zoology), Int. B.Ed-M.Ed. , NET (Education)

ABSTRACT

The purpose of this study was to determine the attitude of parent's towards their mentally retarded children. The sample consisted of 62 numbers of parents from CRSR, Prasanti Bhawan, Bhadrak district of Odisha. A tool like Attitude Scale Towards Parents was used to measure the perception of parent's attitude towards their mentally retarded children. The result show that the parents of children with mental retardation in the CRSR, Prasanti Bhawan show a positive attitude toward the mentally retarded children. They do not have feelings of embarrassment towards their mentally retarded children. However, both the groups, e.g., parents (male and female) members were over protective towards mentally retarded children. But the important finding is that there was a strong feeling of love and acceptance among all the parents towards the mentally retarded children and almost all of them did not display strongly negative attitudes.

KEYWORDS: Attitude, Mental retarded, Parents, Childrens.

INTRODUCTION

Mental retardation is one of the most well known social problem .It is very often observed that the mentally retarded children have several problems. The importance of the family in child development is more significant. Parents behavior and attitude creates a climate in the home which has influence upon the children development. The most extensive social interactions of the child during crucial developmental stages occurs within the family, thus making friendly attitude towards children with disable or without disable has a major importance in all round development of children. All over the world ,the combination of inadequate service provided to the mentally retarded children ,and the shift in care from the institution to the community ,has resulted in placing extra burden on families .It is still unknown how the attitude of parents of mentally retarded children towards their education are differs .In view of the above ,the researcher found it necessary to carry out a study to determine the attitude of parents towards their mentally retarded children and their education . No similar study has never been done on this subject in India.

It is hoped that the findings will be utilized by both mental health staff, teachers trained in special education, family with mentally retarded children.

REVIEW AND RELATED LITERATURE

Rathi, et al. (2017) Study the socio-demographic profile of mentally handicapped children and to compare the Psychiatric morbidity in parents of mentally handicapped children with that of parents of non handicapped children. He found that prevalence

of consanguinity, pregnancy complications, co-morbidity (speech and seizure disorder) and psychopathology in mothers was high in mentally handicapped children as compared to non handicapped children. Panday and Fatima (2016) Study the gender differences in term of Quality of Life among parents of mentally challenged children. Finding of this study showed that parents of male children have good Quality of Life in comparison to the parents of female children. Mohammad et al. (2015) studied on parental attitude of mentally retardation and found that there was a over protection with education and future, home management and total attitude.

A study carried by **Shetty and Menezes (2013)** The attitude of the people has taken a positive turn towards mentally retarded or the challenged, the new modern technical word 'Special Children' due to increased knowledge, awareness due to higher education and the societal initiatives. People with such disabilities are often not seen as full citizens of society. The researchers aim at assessing the knowledge of the parents regarding the mental retardation and the psycho- social, economical problems they face. **Maes et al. (2003)**, studied that family burden is associated with children or adults with Intellectual disability (ID) and behavioral or psychiatric problems living at home. **Kolb and Hanley-Maxwell (2003)** explored parental views about critical social skills of adolescents with high-incidence disabilities **Nihira et al. (2002)** described the relationships between home environment, family adjustment and the social competency of TMR (Trainable Mentally Retarded) and EMR (Educable Mentally Retarded) children. **Seltzer et al. (2001)** conducted a study on "Continuity or discontinuity of family involvement



following residential transitions of adults who have mental retardation". **Wright (1988)** studied attempt to evaluate the effects of the stresses of having a child with disabilities on the lives of their parents. **Costigan et al. (1997)** studied the family process and adaptation to children with mental retardation as disruption and resilience in family problem solving interactions. **Condell (1966)** points out that a mentally retarded child who does not experience acceptance and security in his house is in greater danger of developing behavior difficulties than a normal child. **Rangaswami (1995)** This study revealed that the overall attitude of mothers of retarded children with and without behavior problems differ significantly. The findings of this study showed that the mother's of mentally retarded children are not hopeful about education, future of the children, home management and they feel more hostile towards their children. **Lachiewicz (1994)** conducted a study on Behavioral disorders in moderately mentally retarded children and relation to parental attitude. The result indicated that parents have a negative attitude towards their children with mental retardation. **Wagner et al. (1991)** indicated that young people with disabilities have a more difficult time making the transition to adulthood than their peer without disabilities; and the fears and concerns expressed by parents of students with disabilities confirm that the impact of this transition can be felt by parents as well as the young person leaving high school. After scanning the review of literature it is found that maximum parents of mentally retarded children had positive attitude towards their children, but it is needed to find out the attitude of parents in general perception towards their children. So the present study is justified to conduct on parent's attitude towards their mentally retarded children.

OBJECTIVES OF THE STUDY

Following are the objectives of the study:

- 1 To study the difference in attitude between rural and urban parents towards their mentally retarded children.
- 2 To study the difference in attitude between male and female parents towards their mentally retarded children.

ANALYSIS AND INTERPRETATION

Table-1: Significance difference between attitude of rural and urban parent's towards their mentally retarded children.

AREA	N	Mean	SD	SED	t-ratio	Level of significant
Rural	10	44.56	6.52	2.07	1.31	Not Sig.
Urban	52	47.28	1.64			

To compare the urban and rural parent's attitude towards their mentally retarded children the mean score of these were found separately. The 't' score was employee to find out whether parent's attitude have differed significance for their mentally retarded children. The result indicates that there is no statistically significant difference between urban and rural parent's attitude towards their mentally retarded children.

- 3 To study the difference in attitude between educated and uneducated parents towards their mentally retarded children.

RESEARCH QUESTIONS

1. Are there any statistically significant differences in rural and urban parent's attitude towards mentally retarded children?
2. Are there any statistically significant differences in male and female parent's attitude towards mentally retarded children?
3. Are there any statistically significant differences in uneducated and educated parent's attitude towards mentally retarded children?

METHODOLOGY

The present research work is descriptive survey type of study. A total no. of 62 parents from Bhadrak district of Odisha as sample is drawn randomly. The majority of the sample consisted of parents with children attending CRSR School which caters mainly, for children from rural areas. Out of total 62 parents 79% (n= 49) of these parents were females and 21% (n=13) were males. An Attitude Scale Towards Parents was constructed to investigate parent's attitude towards their mentally retarded children. Each item of scale is to be rated on five consecutive points i.e. **Strongly Agree, Agree, Undecided, Disagree, Strongly Disagree**. An individual's score on the scale is sum total of his/her ratings on all items/statement. The scale has **38** questions, out of these **25** are positive in nature (reflecting favorable attitude) and remaining **13** are negative nature (depicting unfavorable attitude). Two half of parental attitude scale was employing **odd-even** procedure. Each half of scale comprised with 10 items. Internal consistency reliability coefficient (r) for preliminary test of parental attitude scale is found to be 0.89 which also, indicates a fairly high index of intrinsic reliability of this scale.

On this descriptive statistics for Urban parent's (52) and Rural parents (10) attitudes toward mentally retarded children was found. The parent's mean attitude score is (44.56) and (47.28) and SD is (6.528) and (1.64) respectively. The SD was not significant at any level. The SED (2.07) and t ratio (1.31) for rural and urban parents which indicates that there is no statistically significant differences among rural and urban parent's attitude towards their mentally retarded children.

**Table-2: Significance of difference between Male (father's) and Female (mother's) attitude towards their mentally retarded children**

Parents	N	Mean	SD	SED	t-ratio	Level of Significant
Male	13	43.09	6.754	2.06	1.27	Not Significant
Female	49	45.71	6.223			

Above Table II shows there are no statistically significant differences among the parent's attitude due to gender variable. It shows the results of the questionnaire which was distributed among (13) male and (49) female parents about their attitudes towards their mentally retarded child. Means and standard deviations were calculated and results show that females got a higher mean which was (45.71); this indicates that female parents

got more positive attitudes towards their mentally retarded children. Males got a little bit lower mean than females which was (43.09). The t-value (1.27) and SED (2.06) obtained for fathers and mothers respectively were not significant. Thus it is clear that there were no statistical significant differences between the attitudes of father and mother towards mentally retarded children due to gender.

Table-3: Significance of difference between Educated and Uneducated attitude of parent's towards their mentally retarded children

Parents	N	Mean(M)	SD	SED	t-ratio	Level of Significant
Uneducated	22	48.04	1.25	0.84	1.96	Significant at 0.5 level
Educated	62	46.39	1.61			

To compare the Uneducated and Educated parent's attitude towards their mentally retarded children the mean score of these were found separately. The 't' score was employed to find out whether Uneducated and Educated parent's attitude have differed significantly for their mentally retarded children. The result indicates that there is statistically significant difference between Uneducated and Educated parent's attitude towards their mentally retarded children.

On this descriptive statistics for Uneducated parents (22) and Educated parents (40) attitudes toward mentally retarded children was found. The parent's mean attitude score is (48.04) and (46.39) and SD is (1.25) and (1.61) respectively. The SD was significant at 0.5 level of significance. The SED (0.84) and t ratio (1.96) for Uneducated and Educated parents which indicates that there is statistically significant differences among rural and urban parent's attitude towards their mentally retarded children. The mean score of Uneducated parents is higher than that of the Educated parents. It implies that Uneducated parent's have highly positive attitude towards their mentally retarded children.

CONCLUSION

The finding of the study suggest that the parents of children with mental retardation in the CRSR, Prasanti Bhawan express a positive attitude toward the mentally retarded children. They do not have feelings of embarrassment towards their mentally retarded children. However, both the groups, e.g., parents (male and female) members were over protective towards mentally retarded children. But the important finding is that there was a strong feeling of love and acceptance among all the parents towards the mentally retarded children and almost all of them did not display strongly negative attitudes. Thus the research question "whether the attitude of parents towards their mentally retarded

children is positive?" was highly favoured. Responses suggested that many of the parents who have children in the special class are in many cases from the lower socioeconomic group. Parents seem to have a negative attitude toward their children's condition when they first learned of him being mentally retarded. Though parent's did not have any counseling or guidance from professional people, many of the parent's had managed to change their attitudes. This change was based mainly on their own experiences. Parent's appeared to have wanted their children placed in the special class and was pleased with the progress that their children were making in class. These parents appeared not to worry too much about the future of their children. They seemed to believe that if their children can get a job they will be able to take care of themselves. Parents in a few cases had not realized the limitations of their children| this is evident from the fact that they were hoping the children would one day go to college. It appeared that many of the parents wanted their children to get married so that taking care of them would no longer be a problem for them.

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MULTISECTORAL CAPABILITIES IN IMPLEMENTING THE JUVENILE JUSTICE AND WELFARE ACT: A COMPARATIVE ANALYSIS TOWARDS ENHANCED COMPETENCIES

Wennie Ann A Cale, DPA, Ph.D. Crim., Post Doc.

*Faculty College of Criminal Justice and Graduate School, Taguig City University,
Pamantasan ng Lungsod ng Muntinlupa*

Article DOI: <https://doi.org/10.36713/epra16150>

DOI No: 10.36713/epra16150

ABSTRACT

This study evaluates the multisectoral capabilities in implementing the Juvenile Justice and Welfare Act (RA 9344 as amended by RA 10630) in major urban areas of the Philippines, specifically focusing on the Philippine National Police (PNP), Barangay Personnel, and Social Welfare Officers. The objective of this study is to evaluate the diverse proficiencies involved in the implementation of this legislation, with a specific emphasis on the implementers and logistical capabilities of each sector. By employing a quantitative and descriptive methodology, this study aims to ascertain the level of competence and disparities among different demographic categories, with a specific focus on urban regions like Quezon City, Caloocan, Malabon, Navotas, and Valenzuela. The results indicate that the professionals of the Child and Social Welfare Department (CSWDO) have satisfactory levels of competence in both executing and managing tasks. However, there is an immediate need for substantial enhancements in the PNP and Barangay sectors. Notwithstanding the presence of operational gaps, the research revealed no statistically significant disparities in the perceptions of capabilities across various sectors. This suggests that the difficulties are systemic rather than isolated flaws. The findings emphasize the importance of implementing a cooperative and multifaceted approach that includes extensive training, increased human resources, and enhanced logistical support to strengthen the implementation of RA 9344. This approach aims to prioritize a rehabilitative rather than punitive approach to juvenile justice, to promote the welfare and rehabilitation of children involved in criminal activities.

KEYWORDS: *Multisectoral Capabilities, Juvenile Justice and Welfare, Enhanced Competencies, Implementers, Logistics*

INTRODUCTION

The juvenile justice system in the Philippines has seen a progressive change with the passage of RA 9344, as amended by RA 10630, generally known as the JUVENILE JUSTICE AND WELFARE ACT OF 2006 (JJWA), which aims to replace punitive measures with rehabilitative alternatives for adolescents in confrontation with the law. This act emphasizes the value of child welfare by supporting a therapeutic strategy that puts young offenders' rights and rehabilitation ahead of more conventional forms of punishment. The effective coordination and competencies of multiple stakeholders, including the Philippine National Police (PNP), Barangay personnel, and Social Welfare Officers, are critical to successfully executing this act as the Philippines transitions to a more humane and rehabilitative framework.

As the initial contact point for juvenile offenders, the Philippine National Police is essential to the JJWA's enforcement. Their duties go beyond simple law enforcement; they also have to ensure children's rights are upheld during the court proceedings. This calls for a careful balancing act between protecting youth welfare and upholding public order, which calls for specific training and in-depth knowledge of the juvenile justice system.

In the study conducted by Baranda (2014), PNP participants pledged to do everything within their power to fulfill their responsibilities in preventing adolescent delinquency. The functions of detection and counseling stand out the greatest, followed by the transformative and informational ones, which seem to be the least performed. The PNP made every effort to be watchful in identifying potential hotspots for the majority of juvenile offenders as well as locations that are well-known for being breeding grounds for juvenile crime. In some way, being aware of their origins will make it easier for the PNP to carry out their informative and transforming responsibilities. Regardless of age, sex, duration of service, level of education, or rank, the PNP

generally consistently fulfills, to a very high extent, its planned tasks in preventing juvenile delinquency.

In a similar vein, Barangay personnel are crucial community volunteers who work at the local level. They are in a critical position to affect the course of juvenile proceedings because they are frequently the first responders to occurrences involving youngsters. In this particular setting, Barangay personnel's efficacy is dependent on their capacity to manage situations with tact and cognizance of juvenile justice concepts, advocating for restorative measures instead of punishing ones.

On the other hand, social welfare officers play a crucial role in the rehabilitation and reintegration of young criminals into society. They provide a variety of roles, including case management, psychosocial support, and program execution for diversion. These officers work hard to avoid recidivism and promote positive reentry into the community by navigating complicated social issues and providing the support needed to ensure youngsters receive the care and direction they need.

Notwithstanding these stakeholders' vital responsibilities, there are several obstacles to the JJWA's implementation, ranging from a lack of specialized training and resources to problems with interagency collaboration. Comprehending these obstacles is essential in formulating tactics to improve the abilities of all stakeholders, culminating in a more efficient juvenile justice system in the Philippines. By thoroughly reviewing the existing situation and opening the door for changes in the system's overall performance, this analysis aims to shed light on the complex dynamics at play.

LITERATURE REVIEW

In heavily urbanized cities, the Juvenile Justice and Welfare Act (Republic Act 9344, RA 9344) must be implemented with a comprehensive strategy, especially in terms of implementer and



logistical capacity. Powell (2024) draws attention to the growing safety net in the US juvenile justice system, drawing comparisons with the circumstances in the Philippines, particularly with regard to RA 9344. This emphasizes the requirement that implementers be skilled in both managing and applying this more expansive control mechanism to prioritize rehabilitation over punishment, in addition to having a solid understanding of the law. Similar to this, Yin and Zhao (2024) emphasize how crucial it is for police officers to comprehend the law and the legal system. This emphasizes the need for extensive training and education for law enforcement personnel in the Philippines so that they are prepared to handle juvenile cases in accordance with the rehabilitative and restorative justice principles of RA 9344.

Furthermore, the logistics and resources required to support juvenile justice programs are included in the logistics capabilities in the context of RA 9344. In his discussion of Malaysia's restorative justice programs, Mustafa (2023) highlights the significance of logistical support for activities aimed at rehabilitation and reintegration. This is in line with the requirements of the Philippine juvenile justice system as outlined in Republic Act 9344, wherein sufficient facilities, funds, and resources are necessary to enable the successful execution of restorative and rehabilitative initiatives. Furthermore, in order to address the underlying causes of juvenile offences and promote the reintegration of juveniles into their communities, logistic efforts in the Philippines should concentrate on developing and supporting family- and community-based interventions, as highlighted by Azami et al. (2023).

Programs for education and awareness are yet another essential component of an implementer's skill set. A classroom-based program designed to teach youth about the law and their rights is presented by Fix et al. (2023). This program aims to make encounters between youth and law enforcement safer. This kind of instruction should be replicated in the Philippines, where RA 9344 implementers stand to gain from similar initiatives that heighten youths' awareness of their rights and duties and may even lower rates of juvenile criminality. In order to create a society where young people are knowledgeable and less inclined to commit crimes, education is essential.

Regarding legislation, Canete (2022) talks about the controversial discussion around the RA 9344 amendment, notably the plan to lower the criminal liability age. This talk emphasizes how difficult it is for legislators and implementers to strike a balance between the needs of society for safety and accountability and the preservation of juvenile rights. It emphasizes the necessity of a well-informed legislative framework that addresses public concerns and upholds the goals of RA 9344, guaranteeing that the law's execution is both socially and practically acceptable.

Finally, the DILG – CWC Joint Memorandum Circular (2020) and the Robertson et al. (2020) study highlight the value of contextual awareness and adaptability in the juvenile justice system. The dynamic nature of juvenile justice and the need for implementers to modify techniques in response to local conditions and new difficulties are demonstrated by variations in recidivism rates and the requirement for protective measures for children during emergencies like the pandemic. Together, these observations highlight the necessity of a flexible and comprehensive strategy for the multisectoral implementation of RA 9344, making sure that the logistics and implementer capacities are sufficiently taken care of to enhance the juvenile justice system in the Philippines' highly urbanized cities.

Objectives of the Study

The study compared the multisectoral capabilities of implementing the Juvenile Justice and Welfare Act to enhance competencies in highly urbanized cities such as Caloocan, Malabon, Navotas, Valenzuela, and Quezon City. Specifically, it sought answers to the following questions:

1. How do the respondents assess the multisectoral capability in the implementation of RA 9344 as amended in highly urbanized cities in terms:
 - 1.1 Implementer's Capability; and
 - 1.2 Logistics Capability?
2. How do the multisectoral differ in their level of capabilities in implementing the Juvenile Justice and Welfare Act in highly Urbanized Cities in terms of the aforementioned variables?
3. Is there a significant difference among the assessments of the group of respondents on the multisectoral capability in the implementation of RA 9344 as amended in terms of the implementers?
4. Is there a significant difference among the assessments of the group of respondents on the multisectoral capability in the implementation of RA 9344 as amended in terms of the logistics?
5. Based on the findings, what competency enhancement program can be proposed to improve the multisectoral capability in implementing RA 9344 as amended in highly urbanized cities?

METHODOLOGY

This study used a quantitative and descriptive survey approach to examine the multisectoral capabilities in applying Republic Act No. 9344 (as modified) in highly urbanized cities. The present study aimed to ascertain two principal goals: firstly, to appraise how respondents evaluated the multisectoral capability concerning implementer and logistical capabilities, and secondly, to ascertain whether notable variations existed in the evaluations between the respondent groups. This section describes the research methodology, with particular attention on the methods used in the study for data collection, data analysis, population and sampling, and survey design.

The study included a systematic questionnaire to evaluate the respondents' assessments regarding the multisectoral capability for implementing the amended RA 9344. Under the study's objectives, the questionnaire was split into two primary parts: Part 1 examined the Implementer's Capability, assessing the abilities, know-how, and efficacy of individuals directly responsible for carrying out the law. The Logistics Capability was evaluated in Part 2, encompassing the sufficiency and accessibility of resources and support services. A four-point scale was used to assess the items, giving a quantifiable indication of the attitudes and perceptions of the respondents.

Following the guidelines provided by Nassaji (2015), the study was organized using a descriptive research methodology to portray the phenomenon being studied—more precisely, the logistics and implementer's capabilities in relation to the implementation of RA 9344. According to Stokes and Wall (2014), descriptive research provides an in-depth analysis of recent or historical issues, which is crucial for fully comprehending the subtleties of multisectoral capacities. A systematic survey was used to operationalize this study strategy, which sought to define the "what" of the variables under investigation without exploring the "how" or "why" that cause them.

According to Gall, Gall, and Borg (2007), descriptive research aims to describe phenomena and their features carefully. This



method works well for this study since it focuses on examining the current state of multisectoral skills rather than examining the causes or consequences. As a result, using observation and survey instruments was crucial to the data-collecting process, offering a structure for obtaining factual information to describe the phenomena as they exist.

After being gathered, the survey data was collected carefully and statistically. The data was comprehensively outlined using descriptive statistics, highlighting the primary tendencies and diversity in respondents' evaluations of implementers' and logistics' capacities. The study also looked for any discrepancies between the various respondent groups. To do this, significant differences in perceptions among the different groups of respondents were examined using inferential statistical techniques, such as ANOVA.

Scope and Delimitation

This study focused on comprehending the multisectoral capabilities needed to implement the amended Juvenile Justice Welfare Act in the highly urbanized cities of Quezon City, Caloocan, Malabon, Navotas, and Valenzuela. This geographic approach enables a focused analysis of metropolitan areas typical of the complex and varied contexts in which juvenile justice programs are implemented. The study is primarily focused on assessing the implementer's capability and the logistical capabilities. These topics are essential to comprehending how different organizations, including social services, law enforcement, and barangay personnel, work together to administer juvenile justice laws. The study aims to offer a thorough analysis based on the viewpoints of many parties directly involved in the law.

The survey restricts its respondents to three distinct groups based on delimitation: social workers, police officers, and barangay officials, often known as tanods. Concentrating on these groups is to collect focused perspectives from individuals who work directly on the front lines of juvenile justice administration. The study's temporal scope, which spans the academic years 2019–2022, further limits it. The research can reflect current practices and experiences within the designated urban contexts because this time range provides a recent perspective on the implementation procedures and challenges. This methodology establishes the limits of the investigation, guaranteeing a targeted and controllable analysis of the research goals within the designated urban and temporal frameworks.

Data Gathering Tool

The primary research tool used in this study was a structured survey questionnaire, primarily used for data collection. This questionnaire was painstakingly created in two parts to collect extensive data relevant to the study's objectives. The first part of the survey was to gather basic information about the respondents, such as age, gender, civil status, and highest educational attainment. This demographic section aimed to offer background information for the answers given in the following sections and to facilitate a more in-depth examination of the findings based on various respondent profiles.

The capabilities of the multisector, such as the police officers, social workers, and barangay personnel, in implementing RA 9344 as amended were the focus of Part II of the questionnaire, which also covered the study's key findings. This part evaluates the logistics and implementer capabilities, two crucial factors that affect how well the juvenile justice system is implemented. The study used a four-point scale, ranging from "Not Capable" to "Very Capable," to ensure uniformity and clarity in replies. This scaling method was chosen to promote more definitive responses

by eliminating respondents' inclination to remain neutral. The four-point scale made the analysis more straightforward by offering a simple framework for assessing respondents' opinions and experiences with implementing the Juvenile Justice Welfare Act. The utilization of an organized methodology for data collecting facilitated the acquisition of precise and practical insights that were crucial in accomplishing the study's goals.

Further, the survey questionnaire, which served as this study's primary data collection tool, underwent a rigorous validation process to guarantee its dependability, correctness, and relevance. The validation process started with comparing other comparable instruments used in relevant research. A comparison analysis was essential to ensure the items included were relevant and purposefully created to collect the data required for the study. The subject matter experts also carefully reviewed the questionnaire. This step was necessary for incorporating expert opinions and modifications, improving the instrument's overall quality and applicability to the study's goals.

In addition, the questionnaire's face validity was thoroughly examined. This required a thorough examination of every item to determine how it directly relates to the particular issues and goals stated in the study. Face validity is crucial since it guarantees that every question is written in a way that will directly advance the goals of the study. The questionnaire was pre-tested on 25 people who were not included as respondents in the main study after the initial validation procedures. The purpose of this pre-testing phase was to assess the internal validity of the instrument and find any biases, ambiguities, or misconceptions that the questionnaire items might have brought about. The pre-test data were carefully compiled and examined to identify any flaws or shortcomings in the tool. The questionnaire was refined and improved by applying the appropriate corrections in light of the comments and findings from this step. The development of the final questionnaire form, tailored for clarity, relevance, and effectiveness in data collecting for the study, was the outcome of these meticulous validation stages.

Data Gathering Procedures

The study's data collection procedures were methodically planned and carried out in a step-by-step manner to guarantee the accuracy and consistency of the data gathered. The procedure started with identifying the research challenges, which was accomplished by thoroughly analyzing the body of research pertinent to applying the Juvenile Justice Welfare Act (RA 9344 as modified) and the functions of the multisectoral institutions concerned. This initial data-gathering stage was a strong foundation for the research and directed further stages.

After reviewing the literature, the researcher conducted initial interviews with key stakeholders involved in the juvenile justice system. The first conversations played a crucial role in creating the survey tool by identifying critical areas of emphasis and ensuring that the questionnaire met the practical issues and experiences experienced in the field. After the initial creation of a preliminary tool, it was subjected to a process of improvement to guarantee that it was clear, relevant, and comprehensive in collecting the required data for the study.

Before implementing the instrument, the relevant law enforcement agencies and local government entities obtained official authorization. Obtaining the required rights and access was essential in researching the designated Highly Urbanized Cities. After receiving the necessary approvals, a preliminary survey questionnaire was assessed using a small sample group not part of the main study. The pre-test was conducted to detect any possible flaws in the questionnaire's design or content, ensuring



the instrument's efficacy before its more comprehensive implementation.

The survey questionnaire was administered once the pre-test was completed and appropriate adjustments were made. The questionnaires were disseminated to the chosen respondents, guaranteeing an all-encompassing portrayal of the three categories: law enforcement personnel, social workers, and Barangay personnel. After distributing the questionnaires, a methodical retrieval procedure was put in place to gather the completed forms, guaranteeing a high response rate and maintaining the accuracy of the acquired data.

After being retrieved, the answers underwent the proper statistical processing to transform the unprocessed data into insightful knowledge that could be examined further. In order to evaluate the respondents' opinions and experiences with the juvenile justice law's implementation, this stage applied descriptive and inferential statistical techniques. The next step in the data analysis process was to look at the data in light of the goals and research questions of the study.

Ultimately, conclusions and suggestions were developed using the analytical results as a foundation. The results were summarized in this final stage, including essential insights and practical recommendations for resolving the issues raised and strengthening multisectoral capacities for implementing the Juvenile Justice Welfare Act in highly urbanized cities. This all-encompassing strategy guaranteed a rigorous and organized method for collecting and analyzing data, enhancing the study's validity and robustness.

Treatment of Data

Using various statistical techniques to handle the many facets of the research aims, the data treatment in this study was created to analyze the information gathered from the survey questionnaires efficiently. The procedure of treating the data was organized and involved applying particular statistical methods to the various collected data.

The demographic profile of the respondents, which includes age, gender, civil status, and highest educational attainment, the percentage was used. This method allowed for a clear representation of the composition of the study's participants. By calculating the percentage distribution of each demographic attribute, the study provided a comprehensive overview of the background and characteristics of the respondents, offering context to the subsequent analyses of their perceptions and responses.

Evaluating the responses about the degree of multisectoral capabilities in putting the Juvenile Justice and Welfare Act into

practice formed the basis of the study's quantitative analysis. In order to do this, the average responses of the respondent groups on various statements about the logistics and implementer's capability were measured using the weighted mean. The study was able to ascertain the perceived level of each capability feature through a weighted mean, which gave rise to a more nuanced view of the respondents' overall judgment. Every rating scale item was given a weight, and the composite score representing the perceived capability level was calculated by averaging these weighted replies.

ANOVA was used to ascertain whether there were any notable distinctions between the opinions of the three respondent groups, PNP personnel, Social Welfare and Development personnel, and Barangay personnel, about the multisectoral application of the Juvenile Justice and Welfare Act. When comparing the means of three or more independent groups, this statistical test is beneficial in determining whether there is a significant difference between the means of at least one of the groups. The study used ANOVA to find any statistically significant differences in the perceptions of the various groups. These differences could point to areas where experiences or perceptions differ, requiring focused interventions or additional research.

Ethical Considerations

Strict attention to ethical norms was highlighted in the study, which focused on the multisectoral implementation of the Juvenile Justice and Welfare Act within Highly Urbanized Cities to ensure the protection and respect of all respondents. Informed consent was obtained from all respondents before the start of data collection, ensuring that they fully understood the study's goal and their rights, including anonymity and the freedom to withdraw from the study at any time without facing the consequences. The significance of upholding confidentiality was emphasized, guaranteeing personal data privacy and anonymizing responses during analysis to promote integrity and confidence. This strategy guaranteed that participants could answer honestly without worrying about being found out or facing negative repercussions.

In addition, the instrument was carefully assessed to uphold the principle of non-maleficence and prevent any possible harm to the respondents. Prioritizing emotional and psychological safety meant that any discomfort respondents experienced during the study would be promptly attended to. Beyond respondent contact, the ethical principles impacted objective data processing, the honest reporting of the research findings, and the impartial selection of respondents. By putting these moral principles into practice, the study not only protected the respondents' well-being but also improved the validity and consistency of the research findings, offering significant new insights while adhering to the strictest guidelines for research ethics.

RESULTS AND DISCUSSIONS

Multisectoral Capabilities in Implementing Juvenile Justice and Welfare Act in Highly Urbanized Cities

Table 1

Multisectoral Capabilities in Implementing Juvenile Justice Welfare Act in terms of Implementers

Indicators	PNP Personnel		Barangay Personnel		CSWDO Personnel		Total	
	WM	AR	WM	AR	WM	AR	WM	AR
1. Presence of an adequate number of personnel assigned at the Barangay Women's desk, Women & Children Protection Desk (PNP), and social worker from the CSWD to handle Children in Conflict with the Law (CICL).	2.37	LC	2.31	LC	1.99	LC	2.22	LC



2. Duty bearers who handle the CICL possess the knowledge and skills in the systems and procedures in the juvenile justice welfare system.	2.36	LC	2.43	LC	3.05	C	2.61	C
3. Presence of a multi-disciplinary team composed of a social worker, psychologist, medical doctor, and guidance counselor in the child-care facility (Bahay Pag-Asa) to help in the conduct of individual intervention programs for the children in conflict with the law.	1.81	LC	1.81	LC	2.41	LC	2.01	LC
4. Implementers are knowledgeable in the basic techniques in conducting the investigation that are needed during the initial contact of children in conflict with the law.	2.43	LC	2.35	LC	3.48	VC	2.75	C
5. Implementers are equipped with different trainings and seminars regarding the proper handling of Children In Conflict with the Law which includes gender-sensitivity programs.	2.43	LC	2.45	LC	3.07	C	2.65	C
Total	2.28	LC	2.27	LC	2.80	C	2.45	LC

Legend: Very Capable (VC)
Capable (C)

Least Capable (LC)
Not Capable (NC)

Exhibited in Table 7 is the duty bearer's capability in implementing the amended Juvenile Justice and Welfare Act (RA 9344) in terms of the Implementer's Capability as observed by the three groups of respondents. An overall weighted mean of 2.45 was interpreted as Least Capable, as observed by the police, barangay tanods/officials, and social workers.

However, the overall assessment of the three groups of respondents in terms of Implementer's Capability is Least Capable; indicators such as Implementers are knowledgeable in the basic techniques in investigating the initial contact with the CICL acquired the weighted mean of 2.75, duty bearers who handle the CICL possess the knowledge and skills in the systems and procedures in Juvenile Justice Welfare System acquired the weighted mean of 2.61. At the same time, implementers are equipped with different pieces of training and seminars regarding the proper handling of CICL, which includes gender-sensitivity programs, and have garnered a weighted mean of 2.65. This was attributed to the police, specifically members of the Women and Children Protection Desk (WCPD), Barangay tanods/officials, particularly the members of the Barangay Council for the Protection of Children (BCPC), and social workers who competently perform their jobs despite the lack of qualified manpower.

Indicator presence of a multi-disciplinary team composed of social worker, psychologist, medical doctor and guidance counselor in the child-care facility (Bahay Pag-Asa) to help in the conduct of individual intervention programs of the CICL with the mean of 2.01 with the verbal interpretation of Least Capable, since among the five highly urbanized cities under study, CAMANAVA and Quezon City, only Valenzuela City have complied and completed the composition of multi-disciplinary team that manned the accredited Bahay Pag-Asa in the City.

The presence of an adequate number of personnel assigned at the Barangay Women's Desk, Women and Children Protection Desk (PNP), and social workers from the CSWD who handle the Children in Conflict with the Law (CICL) ranked at number 4, with a weighted mean of 2.22 and with the verbal interpretation

of Least Capable. This may be because, in CAMANAVA and Quezon City, there is a need to increase the number of personnel manning the Women's Desk at the Barangay and Police Level, since in the police stations, 1.7% - 2% only of policewoman are assigned in the WCPD based on the 2022 Women and Children Protection Desk data. Also, there is a need to increase the number of social workers who will be solely in charge of handling cases of children in conflict with the law (CICL) and will not be multi-tasking.

The information supplied demonstrates differences in the capacities of different Juvenile Justice Welfare Act implementers, particularly PNP, barangay, and CSWDO personnel. According to the assessment, every sector is 'Least capable' with respect to the number of workers needed to manage children in conflict with the law (CICL), which shows a common need for more staff and resources. This result is consistent with Powell's (2024) analysis of the broader net of control present in juvenile justice systems and points to the urgent need for improved staffing strategies in all relevant Philippine sectors. Furthermore, Yin and Zhao's (2024) focus on the significance of specialized training and education for those involved in the juvenile justice process is echoed by the comparison of the perceived abilities of CSWDO personnel and the less prepared PNP and Barangay personnel.

The apparent disparity between the availability of multidisciplinary teams and fundamental investigative methods also highlights the different levels of readiness across the industries. The CSWDO staff seems more knowledgeable and prepared, especially when it comes to starting investigations and interventions. This is in line with Mustafa's (2023) support of a multidisciplinary approach to juvenile case management. The inadequacy of PNP and Barangay Personnel in managing CICL cases highlights the pressing necessity for extensive training initiatives and institutional changes. This requirement is consistent with the recommendations made by Azami et al. (2023) for community-based strategies and improved training to address juvenile delinquency effectively. These recommendations point to a comprehensive improvement in the multisectoral



implementation of the Juvenile Justice Welfare Act for the better support and rehabilitation of CICL.

Table 2

Multisectoral Capabilities in the Implementation of the Juvenile Justice Welfare Act in terms of Logistics

Indicators	PNP Personnel		Barangay Personnel		CSWDO Personnel		Total		Rank
	WM	AR	WM	AR	WM	AR	WM	AR	
1. Presence of well-equipped processing centers for the conduct of an initial investigation of children in conflict with the law at the Barangay, police, and CSWD offices.	2.42	LC	2.60	C	2.56	C	2.53	C	5
2. Availability of mobile or patrol car/s including gasoline allocation specifically intended for transporting children in conflict with the law to juvenile facilities and other institutions.	2.49	LC	2.38	LC	2.61	C	2.49	LC	4
3. The presence of Bahay Pag-Asa in the area, a 24-hour child-caring institution that provides short-term residential care for children in conflict with the law.	2.12	LC	2.35	LC	2.95	C	2.47	LC	3
4. Availability of funds intended for community-based programs and diversion programs for children in conflict with the law at the barangay, police, and CSWD office.	1.80	LC	2.00	LC	2.45	LC	2.08	LC	1
5. Presence of juvenile lock-up cells or detention facilities intended for children in conflict with the law at the barangay hall and police station.	1.83	LC	2.07	LC	2.37	LC	2.09	LC	2
Total	2.13	LC	2.28	LC	2.59	C	2.33	LC	

Legend: Very Capable (VC)
Capable (C)

Least Capable (LC)
Not Capable (NC)

Table 8 proves the respondents' assessment of the capability of the multisectoral in implementing the Juvenile Justice Welfare Act (RA 9344), as amended, in terms of Logistics. The table shows that the overall assessment of the respondents is Least Capable, with a mean score of 2.33.

The group of PNP Personnel has an overall assessment of Least Capable, with a mean score of 2.13. All of the indicators have an assessment of Least Capable, such as the presence of well-equipped processing centers for the conduct of an initial investigation of children in conflict with the law at the Barangay, police, and CSWD offices, Availability of mobile or patrol car/s including gasoline allocation specifically intended for transporting children in conflict with the law to juvenile facilities and other institutions, Presence of Bahay Pag-Asa in the area, a 24-hour child caring institution which provides short-term residential care for children in conflict with the law, Availability of funds intended for the community-based programs and diversion programs for Children In Conflict with the Law at the barangay, police and CSWD office and Presence of the juvenile lock-up cells or detention facilities intended for children in conflict with the law at the barangay hall and police station, with mean scores of 2.42, 2.49, 2.12, 1.80 and 1.83, respectively.

The overall assessment of Barangay Personnel is Least Capable, with a mean score of 2.28. All but one of the indicators has an assessment of Least Capable, such as Availability of mobile or patrol car/s including gasoline allocation specifically intended for transporting children in conflict with the law to juvenile facilities and other institutions, Presence of Bahay Pag-Asa in the area, a 24-hour child caring institution which provides short-term residential care for children in conflict with the law, Availability

of funds intended for the community-based programs and diversion programs for children in conflict with the law at the barangay, police and CSWD office and Presence of the juvenile lock-up cells or detention facilities intended for children in conflict with the law at the barangay hall and police station, with equivalent mean scores of 2.38, 2.35, 2.00 and 2.07, respectively. The remaining indicator, *The Presence of well-equipped processing centers for conducting an initial investigation of children in conflict with the law at the Barangay, police and CSWD offices*, has an assessment of Capable, with a mean score of 2.60.

On the part of the CSWDO Personnel, the overall assessment is Capable, with a mean score of 2.59. The majority of the indicators have an assessment of Capable, such as the Presence of well-equipped processing centers for the conduct of an initial investigation of children in conflict with the law at the Barangay, police, and CSWD offices, Availability of mobile or patrol car/s including gasoline allocation specifically intended for transporting children in conflict with the law to juvenile facilities and other institutions and Presence of Bahay Pag-Asa in the area, a 24-hour child caring institution which provides short-term residential care for children in conflict with the law, with mean scores of 2.56, 2.61 and 2.95, respectively. While indicators: *Availability of funds intended for the community-based programs and diversion programs for children in conflict with the law at the barangay, police and CSWD office and Presence of the juvenile lock-up cells or detention facilities intended for children in conflict with the law at the barangay hall and police station* have an assessment of Least Capable, with mean scores of 2.45 and 2.37, respectively.



The indicator that obtains the highest mean score of 2.53, interpreted as Capable is the *Presence of well-equipped processing centers for the conduct of an initial investigation of children in conflict with the law at the Barangay, police, and CSWD offices*, while the lowest mean score of 2.08, interpreted as Least Capable is in the indicator *Availability of funds intended for the community-based programs and diversion programs for children in conflict with the law at the barangay, police and CSWD office*.

The results indicate that there is a great deal of room for improvement when it comes to the logistics of managing children who conflict with the law (CICL), especially when working with PNP and barangay personnel. For example, the presence of adequately equipped processing centers is necessary for the preliminary examination of CICL. In contrast, Barangay and CSWD offices are deemed capable, and PNP personnel are deemed 'Least Capable'. This scenario raises concerns similar to those raised by Azami et al. (2023), who stress the significance of

adequate facilities in juvenile delinquency management and suggests that police departments need to improve their infrastructure and resources in order to comply with the standards set by the Juvenile Justice Welfare Act.

Additionally, the evaluation highlights a severe deficiency in community-based and diversionary program offerings, with every sector receiving a "Least Capable" rating. This is especially concerning because the Juvenile Justice Welfare Act's rehabilitative strategy relies heavily on these programs, and it shows that money and resources are generally lacking. This result is consistent with Mustafa's (2023) analysis of the value of restorative justice initiatives. It indicates that more funding and resources are urgently needed to launch successful community-based CICL programs. The data as a whole shows that even though CSWDO personnel are evaluated more highly in terms of their logistical capabilities, there is still a sizable gap in logistics support across all sectors, underscoring the necessity of systemic changes and more funding to guarantee the successful execution of juvenile justice welfare policies.

Table 3
Comparative assessment of the respondents on the Multisectoral Capabilities in the Implementation of Juvenile Justice Welfare Act in Highly Urbanized Cities

Variables	PNP Personnel		Barangay Personnel		CSWDO Personnel		Total	
	WM	AR	WM	AR	WM	AR	WM	AR
1. Implementer's Capability	2.28	LC	2.27	LC	2.80	C	2.45	LC
2. Logistics Capability	2.13	LC	2.28	LC	2.59	C	2.33	LC
Total	2.21	LC	2.28	LC	2.69	C	2.39	LC

Legend: Very Capable (VC)
 Capable (C)

Least Capable (LC)
 Not Capable (NC)

Sub-Problem No. 2. The test of significant difference between respondent's assessments on the Multisectoral Capabilities in the Implementation of Juvenile Justice Welfare Act in Highly Urbanized Cities

Table 3 explains the comparative assessment of the respondents on the capability of multisectoral in the Implementation of the Juvenile Justice Welfare Act (RA 9344), as amended. The result shows that the overall assessment of the respondents is Least Capable, with a mean score of 2.39.

The group of PNP Personnel has an overall assessment of Least Capable, with a mean score of 2.21. The group of Barangay Personnel also has an overall assessment of Least Capable, with a mean score of 2.28. And lastly, the group of CSWDO Personnel has an overall assessment of Capable, with a mean score of 2.69. The variable *Implementer's Capability* obtains the highest mean score of 2.45, interpreted as Least Capable, while, the lowest variable *Logistics Capability* has a mean score of 2.33, interpreted as Least Capable.

Table 3 delineates the diverse views of the three groups of respondents regarding the implementers/duty bearer's capability and logistics capability. The overall assessment of the three groups of respondents gained an overall weighted mean of 2.39, interpreted as "Least Capable".

Law enforcement agencies all over the world are facing unprecedented challenges due to the COVID-19 pandemic. These challenges are at the same time related to the complexity and the large scale of the activities that law enforcement is asked to perform and to the changing nature of their role during the pandemic.

The law enforcement's role may include enforcing public health orders (e.g., quarantines or travel restrictions), securing the perimeter of contaminated areas, securing health care facilities,

crowd-control, monitoring the suspected biological scenes, terrorism, and protecting national stockpiles of vaccines and medical necessities. (Cruz and Frontuna, 2021). It is in this line, that the assessment of the three groups of respondents is "Least Capable" in Implementers Capability because during the surge of the coronavirus, law enforcement agencies which includes police, barangay personnel, and social workers aside from the usual and mandatory functions, were also tasked as frontliners that involved in the implementation of public health orders which is considered as a drastic change in their working environment. With these overlapping functions, the respondents assessed their capability as "Least Capable."

In Logistical capability, aside from the presence of well-equipped processing centers for the conduct of an initial investigation of CICL, all the indicators such as *availability of mobile or patrol car/s including gasoline allocation intended for transporting CICL to juvenile facilities; the presence of Bahay Pag-Asa in the area, a 24-hour child caring institution which provides short-term residential care for Children In Conflict with the Law, the availability of funds intended for the community-based diversion programs and Presence of the juvenile lock-up cells or detention facilities intended for CICL at the barangay hall and police station* have an overall assessment of "Least Capable".

Ranked at number 1 in the indicator is the availability of funds intended for the community-based diversion programs for CICL at the barangay, police, and CSWD office, since the surge of the pandemic most of the LGUs and other government agencies diverted their funds in response to COVID-19 in fact, budget cuts inflicted upon government agencies further ballooned to a net of thirty-four point five billion pesos (P34.5 billion) as more money was diverted to response to global health crisis, (Philippine Daily Inquirer, August 2020.) The budget allocated for diversion programs for CICL was mostly sidetracked since the utmost priority of most government agencies is programs intended for



COVID-19 response. The presence of juvenile lock-up cells or detention facilities intended for CICL at the barangay hall and police station ranked at Number 2.

This has been a long-time problem for the implementers even before when everything was still normal, without the pandemic. The majority of the Police Stations and Barangays do not have juvenile lock-up cells as temporary holding areas of the CICL while undergoing investigation. Those urbanized cities that have CICL lock-up cells, were converted to adult facilities during the surge of the coronavirus. According to the article published by Human Rights Watch in April 2020, the Philippines has had the highest jail occupancy rate in the world since the intensified anti-illegal drug campaign of the government in which hundreds of thousands of people have been jailed since July 2016. Then during the outbreak in March 2020, the arrest and temporary detentions of thousands of people for violating quarantine regulations have further crowded police lockups and jail facilities. The combined population in prisons run by the Philippine Bureau of Corrections and Bureau of Jail Management and Penology (BJMP) has reported a congestion rate of five hundred thirty-four percent (534%) and three hundred ten percent (310%) in March 2020 respectively. Like the diversion programs funds that have been diverted to other programs intended to flatten the curb of the virus, the availability of mobile or patrol car/s including gasoline allocation intended for transporting CICL to juvenile facilities and other institutions has been converted to "Libreng Sakay" free-ride program of the Philippine National Police which aim of reaching out to citizens by providing mobility and other extended services so that commuters could attend to their work with convenience even while in the quarantine period. A lot of law enforcement programs intended for Children in Conflict with the Law have been converted to other programs intended for COVID-19 response which is the uppermost priority of most highly urbanized cities.

Powell (2024) identified systemic issues within the juvenile justice framework and suggested a possible lack of comprehensive training and resources necessary for effective juvenile justice administration. This finding is consistent with the perception of PNP and Barangay Personnel as 'Least Capable.' This is especially important when it comes to logistics capabilities since insufficient facilities and resources can make it very difficult to provide Children in Conflict with the Law (CICL) with the care and rehabilitation they need. The scenario is consistent with Mustafa's (2023) concerns about the need for surroundings that are resource-rich and well-structured to support restorative justice initiatives effectively.

On the other hand, Azami et al.'s discussion of the community-based and rehabilitative orientation of juvenile justice is consistent with the considerably higher skill assigned to CSWDO Personnel (2023). Their better ranking raises the possibility that social welfare agencies are more in line with the Juvenile Justice Welfare Act's guiding principles, which place a greater emphasis on rehabilitation than on punitive measures. The fact that they are not ranked as "Very Capable," however, indicates that there is still room for development in the social services sector, especially when it comes to strengthening cooperation with local government agencies and law enforcement to guarantee a cogent approach to juvenile justice.

The ratings are indicative of a more significant problem that Yin and Zhao (2024) draw attention to, namely the significance of legal expertise and specific training for all those working in the juvenile justice system. Given the critical responsibilities that PNP and Barangay Personnel play in the early phases of juvenile justice processes, it is clear that they require better training and resources. Improving their capacities can result in improved results for CICL, which is consistent with the legislation's rehabilitative objectives.

Table 4

Test of significant difference between respondent's assessments on the Capability of the Multisectoral in the Implementation of Juvenile Justice Welfare Act in terms of Implementers

Source of Variation	Sum of Squares	Degree of Freedom	Mean Squares	F Computed Value	F Critical Value	Interpretation
Between Groups	0.919	2	0.4595	2.81	3.88	No Significant
Within Groups	1.964	12	0.1637			
TOTAL	2.883	14				

Table 4 divulges the test of significant difference in the assessment of the respondents in the Capability of the multisectoral in the Implementation of Juvenile Justice Welfare Act (RA 9344), as amended, in terms of Implementers.

The F computed value of 2.81 is less than the F Critical value of 3.88, with 2 and 12 degrees of freedom. The result shows that there is no significant difference in the assessment of the respondents. The null hypothesis that there is no significant difference in the multisectoral Capability in the Implementation of the Juvenile Justice Welfare Act in terms of Implementers, is Accepted at a 0.05 level of significance.

The findings suggest that the consistency of these competency assessments may point to a structural issue with the Juvenile Justice Welfare Act's implementation. Powell (2024), for example, addresses structural problems in the juvenile justice system, suggesting that problems like insufficient resources and training affect many sectors. The lack of statistically significant disparities between groups in our analysis may be a reflection of this more significant systemic problem, indicating that

adjustments are needed everywhere rather than just in specific industries.

Furthermore, this result is consistent with the worries expressed by Azami et al. (2023), who emphasize the value of community-based strategies for dealing with adolescent delinquency. The consistent evaluation among various groups would suggest a shared need for increased community involvement and resources to promote efficient juvenile justice procedures. Furthermore, the results are consistent with Mustafa's (2023) focus on the necessity of resources and an organized setting in order to promote restorative justice initiatives effectively. The lack of discernible variations in capability evaluations may highlight the general need for improved infrastructure and support in all relevant areas.

Additionally, the outcome backs up the claim made by Yin and Zhao (2024) that competent legal counsel and training are essential for managing juvenile justice cases effectively. The consensus among the groups points to a common need for improved educational and training initiatives to give all staff



members the know-how and abilities needed to carry out juvenile justice policies efficiently and effectively.

Table 5

Test of significant difference between respondent’s assessments on the Capability of the multisectoral in the Implementation of Juvenile Justice Welfare Act in terms of Logistic

Source of Variation	Sum of Squares	Degree of Freedom	Mean Squares	F Computed Value	F Critical Value	Interpretation
Between Groups	0.54117	2	0.27058	3.81	3.88	No Significant
Within Groups	0.85136	12	0.07095			
TOTAL	1.39253	14				

Table 5 illustrates the test of significant difference in the assessment of the respondents in the Capability of the multisectoral in the Implementation of Juvenile Justice Welfare in terms of Logistic.

The F computed value of 3.81 is less than the F Critical value of 3.88, with 2 and 12 degrees of freedom. The result reveals that there is no significant difference in the assessment of the respondents. The null hypothesis that there is no significant difference in the capability of the multisectoral in the implementation of the Juvenile Justice Welfare Act in terms of Logistic Capability, is Accepted at 0.05 level of significance.

This lack of statistically significant variation suggests that the various sectors participating in the juvenile justice system acknowledge the same perceived strengths and issues in logistics, such as facilities, transportation, and resource allocation. This finding is consistent with the more extensive discussions in the literature on the issues associated with the implementation of juvenile justice since it may point to a systemic problem where logistical limits or flaws equally impact all sectors.

The shared belief, for example, is consistent with the issues raised by Mustafa (2023) and Azami et al. (2023) regarding the necessity of environments with sufficient resources to support successful juvenile justice methods, such as rehabilitation and community-based programs. The lack of discernible variations in the logistic capacities evaluated by the various groups may indicate a general need for better infrastructure and logistical planning.

Moreover, this outcome validates Powell's (2024) claims about systemic problems in the juvenile justice system, showing that logistical problems like inadequate facilities and vehicles affect not only one sector but all parties engaged in the process of implementation. This is consistent with the focus on the necessity of extensive improvements and reforms to the juvenile justice system's administrative support systems in order to guarantee the successful and efficient execution of the Juvenile Justice Welfare Act.

CONCLUSIONS AND RECOMMENDATIONS

Based on the findings of the study, the following conclusions were drawn:

Multisectoral Capability

Based on the evaluations provided by the respondents, specific components within the multisectoral structure, particularly the CSWDO, exhibit a reasonable level of proficiency in terms of both implementation and logistical capacities. However, there exists a notable requirement for enhancement within the PNP and Barangay sectors. The detected differences highlight the urgent requirement for extensive training programs, augmented manpower, and improved logistical assistance to strengthen the overall efficacy of the execution of RA 9344. It is essential to address these deficiencies to ensure that all sectors are adequately

prepared to make a constructive contribution to the well-being and rehabilitation of children in conflict with the law (CICL) within the juvenile justice system.

Multisectoral Differences in Level of Capabilities

The evaluation reveals variations in competencies among officers from the Philippine National Police (PNP), Barangay, and CSWDO. The personnel of CSWDO are assessed as 'Capable' in terms of implementation and logistics, but the personnel of PNP and Barangay are ranked as 'Least Capable.' In comparison to law enforcement and local government, social welfare departments have a higher level of capabilities.

Significant Difference among Respondents on Implementers' Capability

There is no notable disparity in the evaluations of multisectoral capabilities across personnel from the PNP, Barangay, and CSWDO. Although there are noticeable discrepancies, they do not have a statistically significant impact. This indicates that there is a systemic problem rather than individual shortcomings in all sectors.

Significant Difference among Respondents on Logistics Capability

There is no significant difference in the perceived logistics capabilities among the respondents, showing that although there may be shortcomings, these perceptions do not exhibit significant variations across other industries, hence implying the absence of significant disparities.

Theoretical Implications

The consistency in evaluating capabilities across several sectors, despite their diverse functions, poses a challenge to the conventional comprehension of multisectoral dynamics in the provision of public services, specifically within the juvenile justice system. This highlights the necessity of adopting a comprehensive theoretical framework that addresses systemic and cross-sectoral obstacles and remedies, surpassing sector-specific models to comprehend the intricacies involved in implementing reforms within the juvenile justice system.

Practical Implications

The results emphasize the urgent requirement for extensive, cross-sectoral training initiatives, improved allocation of resources, and the development of infrastructure in all areas related to juvenile justice. The presence of comparable degrees of proficiency among individuals from the Philippine National Police (PNP), Barangay, and CSWDO highlights the importance of establishing standardized protocols and fostering collaborative endeavors to effectively address the deficiencies in the skills and logistical support of implementers. This suggests a deliberate change in approach aimed at promoting collaboration among different agencies, establishing common resources and training platforms, and ensuring that all sectors possess the necessary



skills and readiness to effectively contribute to the implementation of the Juvenile Justice Welfare Act in metropolitan areas.

The results obtained from the comparative evaluation and statistical examination of the multisectoral capabilities in the implementation of the Juvenile Justice Welfare Act as amended in highly urbanized cities, several recommendations emerge.

1. Develop and implement cross-sectoral training programs that are tailored to address the distinct requirements and responsibilities of professionals from the Philippine National Police (PNP), Barangay, and CSWDO within the juvenile justice system. The primary objective of these programs should be to provide uniformity in knowledge and practices across many sectors, with a particular focus on legal frameworks, child psychology, concepts of restorative justice, and the effective communication and management of Children in Conflict with the Law (CICL).
2. Foster a culture that promotes collaboration and coordination among the Philippine National Police (PNP), Barangay, and CSWDO to enhance operational efficiency and ease the exchange of information. This may entail frequent inter-agency meetings, collaborative community initiatives, and the utilization of shared databases to ensure that all sectors are in sync and making meaningful contributions to the rehabilitation and reintegration of CICL.
3. Obtain additional funds and resources for the sectors involved, with a specific focus on addressing identified shortages in workforce and logistical requirements. This may involve allocating resources to the development of facilities, such as creating child-friendly environments and establishing dedicated transportation for CICL. Additionally, it could involve increasing the personnel to provide sufficient coverage and specialized assistance within the juvenile justice system.
4. Develop a comprehensive framework to facilitate continuous evaluation and feedback on the performance and competencies of all entities engaged in the juvenile justice system. Use this data to continually refine and enhance training programs, operational procedures, and inter-agency collaborations, ensuring the system remains responsive to the needs of CICL and the communities served.
5. Strive to implement policy changes that align with the conclusions and suggestions derived from the multisectoral capability assessment. Furthermore, it is recommended to implement public awareness initiatives aimed at enlightening the community regarding the objectives of the Juvenile Justice Welfare Act, the significance of collaborative efforts across several sectors, and the community's involvement in facilitating the rehabilitation and reintegration of juvenile offenders.

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STUDY OF EFFECTIVENESS OF TURMERIC ETHANOL EXTRACT (CURCUMA LONGA) AS AN ANTI-DYSLIPIDEMIA AGENT IN MALE WISTAR RATS EXPOSED TO PROPYLTHIOURACIL

Ling Jinmei¹, Wienaldi²

¹Master of Clinical Medicine, Department of Clinical Medicine, Faculty of Medicine, Dentistry, Health Sciences, Universitas Prima Indonesia

²Department of Clinical Medicine, Faculty of Medicine, Dentistry, Health Sciences, Universitas Prima Indonesia

ABSTRACT

Turmeric, a type of *Curcuma domestica*, is a traditional medicinal plant in Indonesia. It contains curcuminoids, essential oils, starches, and various minerals. Turmeric has pharmacological benefits like improving blood circulation, reducing inflammation, and acting as an antibacterial agent. Dyslipidemia, a lipid metabolism disorder, can be evaluated *in vivo* and *in vitro*. This study aims to investigate the effectiveness of the ethanol extract of turmeric (*Curcuma longa*) as an anti-dyslipidemia agent in male Wistar rats treated with Propylthiouracil. The study was experimental with Pre-test and Post-test group-only control designs, using male Wistar rats as subjects. It was implemented in January 2024 with samples determined using the Federer formula. The calculations indicate that a minimum of 4 male Wistar rats (*Rattus norvegicus*) is required per treatment group. The rats should weigh between 180 and 200 grams and be between 2 and 4 months old. Turmeric ethanol extract (*Curcuma Longa*) significantly improved lipid profiles, especially at higher doses, reducing total Cholesterol, triglycerides, and LDL while increasing HDL in groups II and III. This anti-dyslipidemia effect is attributed to turmeric phytochemicals, particularly polyphenolic compounds, regulating pro-inflammatory cell signaling and interacting with gut microbiota. The extract, rich in curcumin antioxidants, shows promise as a non-pharmacological therapy for dyslipidemia and atherothrombosis. Moreover, it reduced SGOT and SGPT levels significantly, suggesting protection against Non-Alcoholic Fatty Liver Disease (NAFLD). However, potential mild NAFLD in the turmeric extract group requires further investigation.

KEYWORDS: Turmeric, Curcuminoids, Anti-dyslipidemia, Wistar rats, NAFLD protection

BACKGROUND

Turmeric, which is a variety of *Curcuma domestica*, is a traditional medicinal plant used in herbal medicine in Indonesia. The main component of turmeric is curcuminoids, a type of dye that is present in about 2.5 to 6% of the plant. Turmeric rhizomes contain other chemical elements, such as essential oils, starches, bitter substances, resins, cellulose, and minerals. Turmeric has various beneficial pharmacological effects, such as improving blood circulation and vitality, reducing blockages in the menstrual cycle, having anti-inflammatory (anti-inflammatory) properties, facilitating childbirth, effective as an antibacterial, increasing bile flow (chole gum), reducing farting (carminative), and moisturizing the body (El-Sayed *et al.*, 2011); (Manarin *et al.*, 2019); (Rezzani, Franco and Rodella, 2019); (Sabale, Modi and Sabale, 2013). Dyslipidemia is a lipid metabolism disorder characterized by an increase or decrease in the lipid fraction in plasma. There are several ways to screen or evaluate anti-dyslipidemia activity, namely *in vivo* and *in vitro* methods (Jijith and Jayakumari, 2018; Untari and Pramukantoro, 2020).

Dyslipidemia can develop due to a daily diet that raises cholesterol levels, particularly LDL cholesterol. In dyslipidemia, there is typically a reduction in HDL cholesterol levels, which play a crucial role as natural antioxidants. This

decrease in HDL levels can lead to endothelial dysfunction in blood vessels, causing increased permeability in the endothelial lining. This heightened permeability allows high LDL cholesterol levels in the blood to penetrate the endothelium. Dyslipidemia is classified as a lipid metabolism disorder characterized by abnormal plasma lipid levels, either an increase or decrease. It is a significant risk factor for various diseases, including coronary heart disease (CHD), which remains a significant health concern in Indonesia (Irmadoly *et al.*, 2014). Significant abnormalities in the lipid fraction usually involve increased levels of total Cholesterol, LDL (Low-Density Lipoprotein) cholesterol, and triglycerides, as well as a decrease in HDL (High-Density Lipoprotein) cholesterol (Dipiro *et al.*, 2015) (Ardhani *et al.*, 2017). The disease is also one of the risk factors for atherosclerosis that can cause coronary heart disease (CHD) (D'Agostino *et al.*, 2008). According to American Heart Association data from 2013 to 2016, 92.8 million people, or 38.2% of adults in the United States, have total Cholesterol over 200 mg/dl (Aparicio *et al.*, 2021). Cardiovascular disease is the most common non-communicable disease in the world and was the cause of 17.8 million deaths in 2017 (Wulansari, 2020).

The use of drugs derived from natural ingredients is generally considered safer than chemical drugs, as stated in the Hariana



study in 2007. One natural plant often used is turmeric, which contains a main compound called curcumin, according to research conducted by Ariani in 2017 and Winarto in 2004. Curcumin, in addition to acting as an antioxidant, can also help lower cholesterol levels by inhibiting the reabsorption of Cholesterol from outside sources (exogenous). In addition, curcumin can also increase the activity of HMG-CoA reductase inhibitor enzymes, which play an essential role in the regulation of fat synthesis. Thus, turmeric or curcumin supplements can help keep cholesterol levels within a healthy range. However, remember that natural medicines should also pay attention to the proper dosage and consult a healthcare professional (Komang and Laksmi, 2014); (Yunarto *et al.*, 2019). The efficacy of curcumin was demonstrated in a study involving dyslipidemia patients in the Sawotratap village area of Sidoarjo Regency who were administered turmeric extract for 12 days. Cholesterol levels were measured before and after the administration of turmeric rhizome extract. The research results, analyzed using the Paired t-test, indicated a significant difference in blood lipid levels among the research participants (Gustomi Rima, 2015). This study aims to investigate the effectiveness of the ethanol extract of turmeric (*Curcuma*

longa) as an anti-dyslipidemia agent in male Wistar rats treated with Propylthiouracil.

RESEARCH METHODS

This study adopts an experimental design with a Pre-test and Post-test group-only control design approach, utilizing male Wistar rats as the experimental animals. The study was conducted in January 2024. The sample size for this study was determined using Federer's formula:

$$(r-1)(t-1) \geq 15$$

Information:

r: Number of samples in each treatment group

q: Number of treatment groups

$$5(r-1) \geq 15$$

$$r-1 \geq 15/5$$

$$r \geq 3 + 1$$

$$r \geq 4$$

Based on the results of these calculations, it can be concluded that at least four male Wistar rats (*Rattus norvegicus*) are needed in each treatment group. The rats weigh 180-200 grams and age between 2-4 months.

Table 1. Overview of the treatment of each group

No	Test Group	Treatment
1.	Normal	Test animals were not given any particular treatment and were only fed and drank ad libitum.
2.	Control	Test animals were given 1 ml of 0.5% Na CMC suspension daily for 14 days. Food and drink are provided ad libitum.
3.	Standard (25 mg/kgBB)	Test animals were given an oral suspension of simvastatin 5 ml/kgBB daily for 14 days. Food and drink are provided ad libitum.
4.	Turmeric Extract (<i>Curcuma Longa</i>) - I (300 mg / kgBB)	Test animals were given a Turmeric Extract (<i>Curcuma Longa</i>) dose of 2.5 ml/kg body weight once a day for 14 days. Food and drink are provided ad libitum.
5.	Turmeric Extract (<i>Curcuma Longa</i>) - II (600 mg/kgBB)	Test animals were given a Turmeric Extract (<i>Curcuma Longa</i>) dose of 5 ml/kg body weight once a day for 14 days. Food and drink are provided ad libitum.
6.	Turmeric Extract (<i>Curcuma Longa</i>) - III (1200 mg/kgBB)	Test animals were given a Turmeric Extract (<i>Curcuma Longa</i>) dose of 10 ml/kg body weight once a day for 14 days. Food and drink are provided ad libitum.

a) Measurement of Lipid Profile Parameters

Before the blood draw, the rats were satisfied at least 8 hours before the blood draw. Blood collection is done by direct withdrawal from the heart of mice as much as 1 ml. Put into a microtube and let stand \pm 20 minutes. Then, the blood was centrifuged at a rate of 3000 rpm for 15 minutes to obtain the blood serum of the rats. The determination of lipid profiles is determined by the colorimetric method. Lipid profile examination is conducted at the Health Laboratory, North Sumatra Provincial Health Office.

b) Measurement of Biochemical Parameters of SGOT and SGPT

Blood collection was performed by direct withdrawal from the rat's heart, yielding approximately 1 ml of blood, which was then transferred into a microtube and allowed to stand for approximately 20 minutes. Subsequently, the blood was centrifuged at 3000 rpm for 15 minutes to obtain rat serum. The determination of SGOT and SGPT levels was based on enzymatic reactions using the Dyasis® reagent kit. The

procedure for determining the catalytic activities of SGOT and SGPT followed the working procedure outlined by Dyasis®. SGOT and SGPT examinations were conducted at the Health Laboratory, North Sumatra Provincial Health Office.

The research data were analyzed using SPSS 25 software. Descriptive analysis was conducted on the research data, focusing on central tendency and dispersion, including lipid profile (LDL, HDL, Total Cholesterol, and Triglycerides), color, texture, and weight. Subsequently, the lipid profile data were analyzed using One-Way ANOVA if the data were normally distributed, followed by a post hoc Tukey HSD test to determine significant differences between treatments. However, the Kruskal-Wallis test was used as an alternative for non-normally distributed data.



RESEARCH RESULTS

a. **Extract Characteristics:** After extraction using the maceration method on the ethanol turmeric (*Curcuma longa*)

sample, the extract was found to have the following characteristics.

Table 2. Characteristics of Turmeric Ethanol Extract (*Curcuma Longa*)

Characteristic	Value
Fresh Simplisia Weight (gr)	500 gr
Dry Simplisia Powder Weight (gr)	214 gr
Solvent Volume (ml)	2120 ml
Extract weight (gr)	15,19 gr
Yield (%)	7.20%

The table data above shows that from 500 grams of turmeric (*Curcuma Longa*), an extract of 15.19 grams was found. Thus, the yield obtained from turmeric ethanol extract (*Curcuma Longa*) is 7.20%.

b. Phytochemical Screening

The results of phytochemical screening on turmeric ethanol extract samples (*Curcuma Longa*) can be seen in the following table.

Table 3. Phytochemical Screening Results of Turmeric Ethanol Extract (*Curcuma Longa*)

Phytochemical	Reagent	Results
Alkaloids	Bouchardart	+
Saponins	Mayer	+
Flavonoids	Dragondroff	-
	Wagner	+
Tannins	Aquadest + Alcohol 96%	-
	FeCl ₃ 5%	+
Alkaloids	Mg(s) + HCl(p)	-
	NaOH 10%	-
	H ₂ SO ₄ (p)	-
Saponins	FeCl ₃ 1%	+
Flavonoids	Salkowsky	-
	Lieberman Bouchard	+

The table data above shows that turmeric ethanol extract (*Curcuma Longa*) contains several phytochemical compounds including Alkaloids, Saponins, Flavonoids, Tannins, and Steroids and Terpenoids.

c. Evaluation of Anti-Dyslipidemia Effects

All parameters evaluated in this study, including body weight, total Cholesterol, lipid profile, SGOT levels, and SGPT, were analyzed for normality data using the Shapiro-Wilk test. The results of the normality analysis can be seen in the table below.

Table 4. Results of Data Normality Test with Shapiro-Wilk Test on All Research Parameters

Parameter	P Value	Data Distribution	
Weight	0.399	Usual	
Total Cholesterol before induction	< 0.05	Abnormal	
Total Cholesterol after induction	< 0.05	Abnormal	
Lipid Profile After Treatment	Total Cholesterol	0.445	Usual
	Triglycerides	0.004	Abnormal
	HDL levels	< 0.05	Abnormal
	LDL levels	0.143	Usual
SGOT levels	< 0.05	Abnormal	
SGPT Rate	0.056	Usual	

The data table above shows that body weight, total Cholesterol, LDL levels from the lipid profile after treatment, and SGPT levels have a standard data distribution. In contrast, the other parameters, including total Cholesterol before and after induction, triglyceride levels, HDL levels, and SGOT levels, have a non-normal distribution. Based on these data distributions, parametric statistical analysis was performed on data with a normal distribution, while non-parametric statistical analysis was performed on data with a non-normal distribution.

d. Total Cholesterol

To evaluate the anti-dyslipidemia effects of ethanol turmeric (*Curcuma longa*), a high-fat diet was given to the control group, standard group, ethanol turmeric extract (*Curcuma longa*)-I, II, and III groups. Before and after the administration of PTU, total Cholesterol in all rats was measured, and all total cholesterol data were analyzed using non-parametric statistics. The results of the analysis can be seen in the following table.



Table 5. Comparison of Total Cholesterol Before and After PTU (Propylthiouracil) Administration in All Treatment Groups

Treatment Group	Total Cholesterol (mg/dL)	
	Before Induction	After Induction
Normal	118.00 (110-112)	118.73 (113-165)b
Standard	114.00 (110-117)	211.00 (209-211)a
Kontrol	115.50 (110-116)	210.00 (210-214)b
Ekstrak Ethanol Kunyit (<i>Curcuma Longa</i>)-I	116.00 (110-115)	210.50 (218-223)b
Ekstrak Ethanol Kunyit (<i>Curcuma Longa</i>)-II	113.50 (100-112)	210.00 (210-214)b
Ekstrak Ethanol Kunyit (<i>Curcuma Longa</i>)-III	117.00 (117-125)	209.50 (212-214)b
Nilai P	0.846	0.012

The data is presented as Median (Range). The P value is obtained from the Kruskal-Wallis analysis. Different superscripts in the same column indicate significant differences.

From the data table above, it can be observed that before being given a high-fat diet, the total Cholesterol of rats in all treatment groups did not show significant differences (P value = 0.846). This indicates that the total cholesterol data of rats before the high-fat diet was consistent. However, the total cholesterol

levels in all rat groups after the high-fat diet showed a different distribution, with only the control group, standard group, and Turmeric extract (*Curcuma Longa*)-I, II, and III groups showing consistent total cholesterol levels.

e. Lipid Profile

At the end of the study, all mice were terminated for blood collection and analysis of lipid profile and liver function (SGOT/SGPT). A comparison of lipid profiles in the entire rat treatment group can be seen in the table below.

Table 6. Comparison of Lipid Profiles in the Entire Mouse Treatment Group

Treatment Group	Lipid Profile			
	Total Cholesterol*	Triglycerides**	LDL*	HDL**
Usual	155.00 ± 2.40a	97.50 (97-100)a	55.50 ± 1.64a	61.50 (61-64)a
Standard	147.50 ± 0.58b	105.00 (101-105)b	65.00 ± 1.27b	60.50 (60-65)a
Control	178.50 ± 6.05c	167.00 (162-179)c	107.20 ± 5.60c	28.50 (57-45)b
Turmeric Ethanol Extract I	168.25 ± 1.50d	155.50 (155-155)d	85.75 ± 2.62d	57.50 (56-59)b
Turmeric Ethanol Extract II	165.25 ± 2.22e	120.50 (119-122)e	77.50 ± 1.29e	61.50 (61-65)a
Turmeric Ethanol Extract III	151.70 ± 0.95e	110.00 (109-112)f	68.50 ± 1.28f	61.00 (60-62)a
P Value	< 0.05	0.012	< 0.05	0.012

*The data is displayed as Mean ± SD. P value obtained from One Way ANOVA analysis; **Data is displayed as Median (Range). The P value is obtained from the Kruskal-Wallis analysis. Different superscripts in the same column show significant differences

Table 6. illustrates the comparison of lipid profiles among treatment groups in rats. The Normal group shows total Cholesterol of 155.00 ± 2.40, triglycerides of 97.50 (97-100), LDL of 55.50 ± 1.64, and HDL of 61.50 (61-64). Meanwhile, the Standard group has total Cholesterol of 147.50 ± 0.58, triglycerides of 105.00 (101-105), LDL of 65.00 ± 1.27, and HDL of 60.50 (60-65).

The Control group shows a significant change with total Cholesterol of 178.50 ± 6.05, triglycerides of 167.00 (162-179),

LDL of 107.20 ± 5.60, and HDL of 28.50 (57-45). Furthermore, the treatment groups with Ethanol Turmeric Extract (*Curcuma Longa*) show a decrease in total Cholesterol, triglycerides, and LDL successively for Ethanol Turmeric Extract (*Curcuma Longa*)-I (168.25 ± 1.50, 155.50, 85.75 ± 2.62, and 57.50), Ethanol Turmeric Extract (*Curcuma Longa*)-II (163.25 ± 2.22, 120.50, 77.50 ± 1.29, and 61.50), and Ethanol Turmeric Extract (*Curcuma Longa*)-III (151.70 ± 0.95, 110.00, 68.50 ± 1.28, and 61.00). A P value less than 0.05 indicates significant differences among treatment groups, particularly in total Cholesterol and LDL. This suggests that administering ethanol turmeric extract in rats can potentially improve lipid profiles, primarily by reducing total Cholesterol and LDL and increasing HDL in specific treatments.

Table 7. Comparison of SGOT and SGPT Levels in All Treatment Groups

Treatment Group	SGOT (U/L)	SGPT Rate (U/L)
Usual	37.50 (36-30)a	47.50 ± 1.50a
Standard	110.00 (106-110)b	171.00 ± 1.34b
Control	167.50 (163-170)c	97.35 ± 1.50c
Turmeric Ethanol Extract (<i>Curcuma longa</i>)-I	117.50 (116-130)d	100.75 ± 3.56d
Turmeric Ethanol Extract (<i>Curcuma Longa</i>)-II	131.00 (130-134)e	115.00 ± 4.50e
Turmeric Ethanol Extract (<i>Curcuma Longa</i>)-III	139.50 (134-130)f	143.00 ± 3.04b
P-Value	0.012	< 0.05



*The data is displayed as Mean \pm SD. P value obtained from One Way ANOVA analysis; **Data is displayed as Median (Range). The P value is obtained from the Kruskal-Wallis analysis. Different superscripts in the same column show significant differences

Table 7 provides an overview of the comparison of SGOT and SGPT levels among treatment groups in rats. The Normal group shows SGOT levels of 37.50 (36-30) and SGPT levels of 47.50 \pm 1.50. On the other hand, the Standard group shows a significant increase, with SGOT levels reaching 110.00 (106-110) and SGPT levels of 171.00 \pm 1.34. The Control group shows a substantial change with SGOT levels of 167.50 (163-170) and SGPT levels of 97.35 \pm 1.50. Furthermore, the treatment groups with Ethanol Turmeric Extract (*Curcuma Longa*) show a decrease in SGOT and SGPT levels successively for Ethanol Turmeric Extract (*Curcuma Longa*)-I (117.50, 100.75 \pm 3.56), Ethanol Turmeric Extract (*Curcuma Longa*)-II (131.00, 115.00 \pm 4.50), and Ethanol Turmeric Extract (*Curcuma Longa*)-III (139.50, 143.00 \pm 3.04). A P value less than 0.05 indicates significant differences among treatment groups, particularly in SGOT and SGPT levels. These results suggest that administering ethanol turmeric extract in rats can decrease SGOT and SGPT levels, indicating a possible improvement in liver function using ethanol turmeric extract in specific treatments.

DISCUSSION

The results of this study indicate that ethanol turmeric (*Curcuma Longa*) extract shows significant improvement in lipid profile at the end of the study. The highest dose of ethanol turmeric (*Curcuma Longa*) exhibited the most optimal improvement in lipid profile. This can be seen from the reduction in total Cholesterol, triglycerides, and LDL levels, as well as the increase in HDL levels in the Turmeric Extract (*Curcuma Longa*)-II and III groups. However, the lipid profile improvement in the Turmeric Extract (*Curcuma Longa*)-III group did not surpass the improvement shown in the standard group.

The anti-dyslipidemia effect of ethanol turmeric (*Curcuma Longa*) extract may be related to various phytochemicals in turmeric rhizomes. Some studies have demonstrated the potential of phytochemicals as anti-dyslipidemia agents. Polyphenol content can lead to down-regulation of pro-inflammatory cell signaling pathways such as nuclear factor- κ B, activated protein-1, and mitogen-activated protein kinase by inhibiting the arachidonic acid cascade and eicosanoid derivatives. Another possible mechanism for the anti-dyslipidemia effect of polyphenolic compounds is the regulation of gut microbiota. Polyphenolic compounds in the gut interact with gut microbiota, leading to increased production of beneficial metabolites such as short-chain fatty acids. Additionally, gut microbiota such as *Akkermansia muciphilia* sp. can restore intestinal inflammation and improve gut permeability and insulin sensitivity. Furthermore, improvement in gut microbiota protects the gut-liver axis, thus reducing the lipid profile in the body. (Sun, Wang, and Qin, 2018; Feldman et al., 2021)

Other studies focusing on the anti-dyslipidemia effects of ethanol turmeric are limited. However, the survey by Ardhani (2017), titled "Effectiveness of Turmeric Extract (*Curcuma domestica*) as Non-Pharmacological Therapy for Dyslipidemia and Anti-Atherosclerosis," stated that turmeric extract administration can be a non-pharmacological therapy for dyslipidemia and as an anti-atherosclerotic agent. Turmeric extract contains curcumin compounds, which are antioxidants. Curcumin can reduce LDL oxidation, which plays a role in foam cell formation, suppresses blood vessels' inflammation, and protects blood vessel endothelium from free radicals (Ardhani et al., 2017). Besides its antioxidant properties, curcumin can lower cholesterol levels by inhibiting the reabsorption of exogenous Cholesterol and increasing the activity of Hmg-CoA reductase inhibitors, thus promoting proper fat synthesis (Komang and Laksmi, 2014). Treatment and prevention of diseases with curcumin are considered as effective as pharmacological approaches (Shishodia et al., 2005).

Additionally, ethanol turmeric extract significantly reduced SGOT and SGPT levels compared to the control group. The decrease in SGOT and SGPT levels is related to the improvement of Non-Alcoholic Fatty Liver Disease (NAFLD). Several studies have shown that NAFLD is a risk factor for atherosclerosis. This is because NAFLD causes dysfunction of blood vessel endothelium. Thong and Quynh (2021) reported that SGOT and SGPT correlate with NAFLD occurrence, but using SGOT and SGPT separately can lead to errors in confirming mild NAFLD. In cases of severe NAFLD, SGOT will increase slightly, and in milder cases, SGOT levels may be found within the normal range. Therefore, using SGOT and SGPT separately may lead to errors in confirming mild NAFLD degrees (Thong and Quynh, 2021).

In this study, SGOT and SGPT levels in the rat groups receiving ethanol turmeric extract (*Curcuma Longa*) were lower than SGOT and SGPT levels in the control group. This indicates that ethanol turmeric extract (*Curcuma Longa*) can protect liver tissue from NAFLD compared to the group not receiving ethanol turmeric extract (*Curcuma Longa*). However, the possibility of mild NAFLD in the rat group receiving ethanol turmeric (*Curcuma Longa*) extract cannot be ruled out.

CONCLUSION

Turmeric ethanol extract (*Curcuma Longa*) provided significant lipid profile improvements, especially at the highest doses, with reductions in total Cholesterol, triglycerides, and LDL, as well as increased HDL in groups II and III, although not yet exceeding the standard group. Anti-dyslipidemia effects are linked to turmeric phytochemicals, especially polyphenolic compounds, which lower lipid profiles by regulating pro-inflammatory cell signaling and interaction with gut microbiota. Turmeric extract, with curcumin compounds as antioxidants, has potential as a non-pharmacological therapy for dyslipidemia and antiatherosclerosis. In addition, turmeric ethanol extract showed a significant reduction in SGOT and SGPT levels, showing the potential to protect against Non-Alcoholic Fatty Liver Disease (NAFLD). However, the



possibility of mild NAFLD in the group of rats receiving turmeric extract needs further investigation.

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THE LIVED EXPERIENCE OF SELECTED FILIPINO FEMALE SOLO PARENTS OF CHILDREN WITH AUTISM SPECTRUM DISORDER DURING A STATE OF HEALTH EMERGENCY

Jessica Chisa D. Berdan (Berdan)¹, John Mark S. Distor (Distor)²

¹Polytechnic University of the Philippines-Graduate School

² Polytechnic University of the Philippines-Graduate School

Article DOI: <https://doi.org/10.36713/epra16163>

DOI No: 10.36713/epra16163

ABSTRACT

This paper explores the lived experience of selected Filipino female solo parents raising children with autism spectrum disorder (ASD) during a state of health emergency like the COVID-19 pandemic. Employing qualitative phenomenological investigation, semi-structured interviews were conducted and analyzed using interpretative phenomenological analysis (IPA). The study employed purposive sampling and snowball techniques to gather valuable data. Results highlighted that solo parent of children with ASD encountered exacerbated difficulties, including emotional burdens, communication challenges, financial constraints, and adjustments to remote learning. They also grappled with the role of a full-time solo parent, isolation from social life, and navigating changes in social interactions. Despite these hardships, participants reported receiving support from both their immediate families and communities. They embraced protective roles for their children with ASD, adopting specialized caregiving techniques while setting boundaries and discipline. As they moved forward, these solo parents demonstrated acceptance of their children's conditions, acquiring specialized child-rearing skills, and strengthened faith.

KEYWORDS: autism spectrum disorder, COVID-19, Female solo parents, Polytechnic University of the Philippines, solo parents.

I. INTRODUCTION

The COVID-19 pandemic posed problems for many families. However, for single parents, the unexpected responsibility of caring for children whose schools and recreational facilities have been closed and whose usual caregivers are unavailable can be particularly daunting. Coping with the daily demands of life during quarantine, which may include managing remote work or dealing with the consequences of unexpected job loss, is stressful in and of itself. When you consider the lack of interaction with other adults in one's social circle, the role of single parenting can appear overwhelming (Garey, 2022).

A single mother is a woman who finds herself living independently due to reasons like divorce, the loss of a spouse, or an unexpected pregnancy (Naz, et al., 2020), remarriage, separation, and divorce (Ciletti, 2023). A single mother is responsible for providing for her own needs and is also responsible for the well-being of her children. These single mothers must address a multitude of requirements, which necessitates increased efforts to fulfill their family's needs. These requirements encompass basic needs, and the educational needs of their children, as highlighted by Meilianna & Purba (2020). The pandemic exacerbates this predicament as the nation's economy deteriorates and health complications may emerge as additional burdens.

Amid the ongoing pandemic, single mothers are also prone to heightened stress levels because they must simultaneously earn a living and ensure that their children's educational success, as highlighted by Hertz & Mattes Jane (2020), along with Knoef & Van Ours (2016). The efficiency with which they manage their responsibilities greatly influences their willingness to consider taking on overtime work to support their children, as noted by Rahayu (2017).

The experiences of single mothers struggling to provide for their families gave rise to another challenge: economic vulnerability. Kramer et al. (2016) argued that single mothers are more likely to experience poverty and attain lower levels of education compared

to single fathers where income levels serve as a metric for measuring poverty, as they pose obstacles to securing a better standard of living, particularly for single mothers, as discussed by Chi et al. (2017).

The struggles faced by single mothers become even more profound when they have children with special needs, leading to heightened stress levels. Children with special needs demand increased attention due to their susceptibility to illnesses. Furthermore, single mothers must shoulder additional responsibilities, such as monitoring dietary requirements and maintaining hygiene in clothing, as outlined by Schilling et al. (2016) as cited in Djap, et al. (2021).

II. METHODOLOGY

This research aimed to explore the personal experiences of solo parents in the Philippines who have children with ASD during the COVID-19 pandemic. Qualitative studies are employed to investigate various phenomena through personal accounts, allowing researchers to delve into different contexts and situations. To fulfill the research goal, a qualitative phenomenological approach was chosen, aiming to provide comprehensive insights into the experiences of Filipino solo parents facing the challenges of the pandemic alongside their children's ASD condition. Creswell (2013) emphasized that qualitative research seeks to describe, analyze, and interpret phenomena, focusing less on hypothesis testing and more on gaining an in-depth understanding.

To collect and analyze data, semi-structured interviews were conducted using the interpretative phenomenological approach (IPA). IPA aims to uncover participants' unique experiences and meanings attributed to them. Rather than striving for an objective depiction of an event, IPA relies on individual perspectives or accounts. As explained by Finlay & Gough (2003) and cited in Cunanan & Yabut (2019), IPA is concerned with how individuals interpret and make sense of their personal and social realities. It doesn't seek to confirm a hypothesis; rather, it investigates the phenomenon in detail.



To comprehensively grasp respondents' lived experience, hermeneutic phenomenological and idiographic analysis approaches were employed. The fundamental objective, as described by Creswell (1998) and cited in Cunanan & Yabut (2019), is to describe the significance of lived experience concerning a particular phenomenon for multiple individuals. Hermeneutic phenomenology, as outlined by Laverly (2003) and cited in Cunanan & Yabut (2019), delves into the lifeworld and human experiences to establish meaning and understanding.

The IPA process involves double hermeneutics, a two-stage interpretive process. The participant interprets their environment, and the researcher interprets the participant's interpretation. This approach enables a thorough exploration of the participant's world, as explained by Smith & Osbourn (2007) and cited in Cunanan & Yabut (2019).

Furthermore, IPA adopts an idiographic mode, where data is gathered through the analysis of each individual case. This approach aims to provide specific insights into the perceptions and understandings of the particular group under study, avoiding making broad generalizations prematurely.

III. RESULTS AND DISCUSSION

Theme 1: Economic Struggles and Social Isolation. The interviewed solo parents of children with ASD shared that they have simultaneously experienced multiple challenges and discrimination while raising their child during the COVID-19 pandemic. These challenges may have existed prior to pandemic but intensified when COVID-19 pandemic started. This theme highlights the ordeals that these solo parents went through based on their statements during the interview.

Economic struggles and social isolation can be significant challenges for female solo parents of children with ASD. These struggles are rooted in a combination of economic and social factors that intersect to create a complex set of difficulties for these families. Raising a child with ASD often involves significant financial costs. These can include therapy, medical expenses, specialized education, and assistive technologies. Female solo parents may bear the full financial burden without a partner's income to share the costs (Montes & Halterman, 2007). Also, female solo parents of children with ASD struggled in balancing the demands of caregiving and employment as it can be particularly challenging for them. They may need to reduce work hours or even quit their jobs to provide adequate care for their child with ASD (Parish, et al., 2012).

This theme has identified three (3) subthemes, namely: *experiencing multiple plights; dealing with discrimination; and sacrificing personal life over parenthood.*

Experiencing Multiple Plights. Experiencing multiple plights refers to facing various challenges and difficulties that occur simultaneously, often compounding the burden on individuals. In the context of financial struggles, individuals may encounter economic hardships, job losses, or increased financial responsibilities, creating a strain on their ability to meet basic needs and fulfill other obligations.

Dealing With Discrimination. The Equality Act of 2010 of England defined two types of discrimination, both direct and indirect. Direct discrimination occurs when an individual is subjected to disparate and unfair treatment because of the person's disability while indirect discrimination is when an existing organization or group of persons have anti-discrimination practices put in place but makes the person feel at a disadvantaged way (Mind, 2019). These ordeals are apparent

on the nine (9) subthemes that were identified from the interview transcripts.

Sacrificing personal life over parenthood. Becoming parents marks a significant period that brings about considerable effects on new parents, both as a partnership and as individuals. One of these is sacrificing personal life for the sake of parenthood, which is a compelling phenomenon that underscores the profound dedication and commitment of individuals to their roles as caregivers.

Theme 2: Balancing Caregiving in Adversity. Balancing the responsibilities of caregiving during challenging times poses an intricate and multifaceted dilemma, particularly for single mothers raising children with ASD amidst the COVID-19 pandemic. Caregiving encompasses the provision of physical, emotional, and often financial aid to those in need, such as children, elderly relatives, or individuals with disabilities or illnesses. Adversity can manifest in various forms, including financial difficulties, health crises, natural disasters, and personal stressors. Successfully managing caregiving in the face of adversity demands thoughtful consideration of both the caregiver's and the care recipient's needs, along with accessing the available resources and support systems. Within this context, three key subthemes emerged: *safeguarding parental role; instilling discipline; and utilizing available resources.*

Safeguarding Parental Role. The Significance of safeguarding parental roles has been recognized within the field of child development and psychology. According to Bronfenbrenner's ecological systems theory (Bronfenbrenner, 1979), parents are situated at the heart of the microsystem, which comprises the immediate surroundings that impact a child's growth. Parents assume the roles of primary caretakers and exemplars, molding the child's interactions and perception of the surrounding world.

Safeguarding parental roles becomes even more critical when considering children with specific needs, such as ASD. Solo parents of children with ASD often face unique challenges in ensuring their children's well-being and development. The parental role in this context entails understanding and addressing the specific needs, communication styles, and sensory sensitivities of children with ASD.

Instilling Discipline. Similar to all parents, solo parents of children with ASD also have the responsibility of addressing their children's errors. Engaging in discipline is a crucial parental duty, particularly when they recognize that it contributes to maintaining the approach used by therapists to guide the child in leading a functional life.

Theme 3. Empowerment Through Support and Religiosity. The third major theme that was identified stresses that empowerment through support and religiosity underscores the transformative potential of both social support systems and religious beliefs in fostering individuals' strength, agency, and resilience in the face of challenges. The combined effects of interpersonal support networks and spiritual beliefs contribute to a comprehensive framework that enables individuals to navigate adversity with a sense of purpose, self-efficacy, and hope.

In essence, empowerment through support and religiosity signifies a holistic approach to resilience-building. Drawing from interpersonal relationships and spiritual convictions, individuals are equipped with a multidimensional arsenal that fortifies their psychological resources, nurtures their sense of agency, and imbues them with the courage to face adversity head-on, which in this case is the COVID-19 pandemic while fulfilling the role of a solo parent to a child with ASD.



Acceptance and Moving Forward. Acceptance and moving forward represent a dynamic process through which individuals confront challenges, acknowledge their circumstances, and proactively engage in constructive responses to adversity. This multifaceted approach involves acknowledging both the limitations and possibilities presented by life's difficulties and taking deliberate steps towards growth and adaptation. The synergy of acceptance and forward momentum has garnered attention within psychological literature as an integral mechanism for fostering resilience and well-being.

Experiencing Faith and Religiosity. After enduring numerous challenges, facing discrimination, juggling diverse roles, and dealing with limited resources amid the COVID-19 pandemic, solo parents of children with ASD have expressed a heightened reliance on their faith in the Divine. This phenomenon was found to potentially offer protection against psychological distress.

IV. DISCUSSION

The COVID-19 pandemic has brought about many challenges to all people alike, worldwide. In all these plights, it also shed light on the role of female solo parents of children with ASD during the pandemic. The respondents have shared that their multiple plights as solo parents to children with ASD has intensified and that they have received both direct and indirect discrimination from both inside and outside their family. Part of the multiple struggles they went through are related to communication problems; financial difficulties; sacrificing their career to fulfill the role of a fulltime solo parent; social life is disengaged; and adjusting socially relating to how they are when around their friends and outside their homes.

The participants also conveyed that amidst the challenges and adaptations they encountered, they found solace in the support provided by both their immediate families and the community, all the while enhancing their role as caregivers for their children with ASD. Throughout the COVID-19 pandemic, it is notable that the respondents became notably more vigilant and protective, acquiring specialized caregiving skills tailored to their children's specific needs, while also establishing boundaries and implementing disciplinary measures to facilitate their children's enhanced functionality.

Moving forward, solo parents of children with ASD embraced the reality of their children's circumstances and recognized how their roles needed to evolve to meet their children's requirements. Along with this acceptance, their faith in the Divine has become bigger in the sense that they saw a purpose despite what they went through.

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THE IMPORTANT ROLE OF REVERENCE IN MYANMAR SOCIETY

Gunasettha¹, Dr. Yeshpal²

¹PhD Research Scholar, Samrat Ashok Subharti School of Buddhist Studies, Swami Vivekanand Subharti University, Meerut-250002

²Assistant Professor, Department of Languages, Swami Vivekanand Subharti University, Meerut-250002

ABSTRACT

All people want world peace right now, but they haven't been able to make it happen. If one wishes to achieve peace, they must pursue it morally, which is the responsibility of morals. In Myanmar, the path to achieving peace is the path of action described in the Mangala Sutta (the thirty-eight blessings), which results in happiness and tranquillity. "To have reverence" is one of the most crucial social connection rules among them. This research paper seeks to demonstrate reverence as a morally important idea in Myanmar's society. "Why is the concept of reverence essential for social relationships?" is the research problem. These are the primary research questions. Why is there a decline in moral responsibility in the modern era? What is the proper path to happiness and serenity in day-to-day living? And, how can I use it correctly in my day-to-day life? It is hypothesized that humans can attain happiness and serenity via appropriate practice.

INTRODUCTION

The fundamental fabric of Myanmar society is woven with Buddhist ideals; they have shaped our political, social, and familial structures, as well as our art and culture. The Dhamma of Buddha serves as the foundation for Buddhist ethics. The Dhamma, or the path to *Nibbana*, is the second figure because it is universal, has some very basic aspects that ordinary people with ordinary perspectives can understand, appreciate, and follow, and it contains the truth or solution to the problems facing humanity. The normal man is primarily concerned with *Sila* out of its three main parts, *Samadhi*, *Panna*, and ultimate fulfilment the goal of *Nibbana* which march together. And for good reason *Sila* is the foundation of Buddhism, from which all higher achievements flow. The *Mangala Sutta* contains the moral guidelines established by the all-powerful Buddha, and their simplicity is truly lovely. So inscribed with the seal of everlasting truth that all intelligent and good-willed individuals, regardless of their personal beliefs, ought to recognize and honor them.

As one of the most well-known of Buddha's teachings, the *Mangala Sutta* is attributed with qualities that make it the most widely utilized *Sutta* in Buddhist countries, where it is delivered as a sermon for blessing and protection. Another name for the *Mangala Sutta* is the Thirty-Eight Noble Blessings. The twenty-second noble blessing, "To have reverence," is the most important of all for all human races. It has shown beneficial for people of all ages, but it is especially crucial for the young. because it provided them with a thorough education in moral principles that will act as an unwavering guidance for the rest of their lives. The idea of reverence ought to be understood by everybody. This paper aims to illustrate the significance of reverence in society for this reason.

Buddhism in Mangala Culture

'Mangala' is the word that Myanmar people use the most. The word "Mangalabar" has become a common way for people to welcome one another in Myanmar society. It is currently the customary way that teachers and students greet one other in schools. The greeting's meaning is very apparent. The message is "May your day be good" or "May you have good luck" or anything like, since the term "Mangala" signifies something good, auspicious, lucky, or a positive sign. Yes, it really is a message of goodwill. Thus, the definition of "Mangala" could be defined as "seeing, hearing, or experiencing something pleasant physically."

Mangala Sutta's Origins

Buddhism has numerous well-known *Suttas* that the Buddha taught. The *Mangala Sutta* is a well-known *Sutta* among them. Twelve years passed while devas and humans debated what made an auspicious or "Mangala," hoping to find happiness and prosperity. People before then were mostly led by omens and signals that they believed to be lucky. They couldn't come to an agreement amongst themselves over the precise definition of a *Mangala* due to disagreements. The *devas* brought the issue of "Mangala" to *Sakka*, the King of the *devas*. *Sakka* refused to respond to them because he understood that the Buddha was the only one who could provide them with the correct response. He chastised them for visiting him rather than the Buddha. "Why did you not go to the flame instead of coming to a firefly to make a fire?" the *devas* responded. Then someone went up to the Buddha and asked him to address the issue. *Sakka* despatched a *deva* to the Buddha at the Jetavana monastery on his behalf. It was there that the Buddha spent the night delivering the *Mangala Sutta* to the *deva*. Three months after the Buddha's death (*Parinibbana*), it was recounted to the Venerable Ananda at the First Buddhist Council.



In one stanza of poem, the *deva* asked the Buddha to explain to him what the stanzas meant. The *Sutta's* body consists of these twelve stanzas. When the Buddha delivered the *Mangala Sutta*, he disregarded superstitions and other interpretations of "*Mangala*." He presented the *Mangala* to them in a more useful and realistic light. Austerity Practices came next, and the Practice of Purity came last, leading to the experience of *Nibbana*. Thus, the Buddha had reduced all moral virtues to thirty-eight principles or styles of conduct within the constrained scope of these eleven brief stanzas. One can become a decent son, a good parent, a godly citizen, a good administrator, or even an ideal head of state if these *Mangala* norms are followed. As a result, these *Mangala* laws are crucial to creating a country of law-abiding citizens and an Ideal State, or *Mangala* Country.

The 38 Types of Fortunate Behaviour

The ethical teachings of Buddha serve as the primary foundation for Myanmar Buddhism. The five and eight commandments are the benchmarks by which we can assess a man's moral goodness in Myanmar Buddhism. In addition to these precepts, a morally upright person must observe the Thirty Eight Blessings. Another name for the *Mangala Sutta* is the Thirty-Eight Blessings. It has shown beneficial for people of all ages, but it is especially crucial for the young, because it provides them with a thorough education in moral principles that will act as an unwavering guidance for the rest of their lives. The *Mangala Sutta* lists thirty-eight auspicious circumstances.

The oldest rule of Lord Buddha, the Thirty-Eight Noble Blessings, outlines the highest duties of human beings and is best practiced by people who genuinely wish peace. This paper examines the twenty-second Noble Blessing, which is called "Reverence," out of the thirty-eight blessings.

The Blessing of 'Reverence' for Twenty Seconds

The twenty-second blessing is reverence. In *Pali*, reverence is called (*Garava*). A person who is deserving of respect should be treated with various degrees of regard. Culture is another term for reverence. For a man, it is quite valuable in his social life. It is a part of excellent manners or courtesy. It is a path to global achievement for a man. It wins other people's affection, favor, and goodwill. Therefore, in dealing with others, everyone should treat them with respect and veneration if they are deserving of it due to their age, character, wisdom, virtue, or other associations, either by words or physical manifestations. To put it another way, everyone should always express respect through words or deeds to those who are older, more senior, in a higher position, etc. And as all life is precious, one should treat all forms of it with love, respect, and good will, regardless of how big or small.

Reverence as a Culture

Respect is the attitude toward and the outward and verbal manifestation of people deserving of honor. The emotion of respect is what separates the human and animal groups from one another. People and animals are the same when it comes to

disrespectful behavior. Respect, then, is a culture that elevates people to the level of civilized creatures.

Respect is the foundation of reverence. There can be no reverence without respect. It is therefore impossible to separate these two attributes. Reverence is the outward and verbal manifestation of respect, while respect itself is a mental quality. Expressions of respect, both verbal and physical, are reflections of the feelings one has while treating someone with dignity. In the world of everyday living, holding a valuable asset is temporary. A person may get these things at any time, and they may also depart from him. He greets them with a smile and a joyful heart when they arrive, but he is terribly sad and grieving when they leave. Therefore, acquiring priceless items won't make him happy forever.

On the other hand, holding spiritual or religious treasures is a lifelong endeavor. Because a man's heart can be destroyed by one. They become happier and more content as they accumulate more of these items. The triple diamonds are the most valuable and deserving of our awe and respect among the spiritual treasures. In addition, sincere love is bestowed upon individuals who respect their parents, guardians, teachers, old people, etc. If they disregard those, they might live lengthy lives devoid of elegance and grandeur. They might be graceful and full of grandeur, but they lack longevity. Respecting people who deserve it is the best way for those who want to be respected by others. Thus, from an early age, they should cultivate the wonderful virtue of reverence in everything. Thus, "to revere and honor those who deserve it" is what the Blessed One imparted as the twenty-second Noble Blessing. These four blessings, namely long life, beauty, happiness, and strength, are enhanced for the one who is always inclined to regard and respect the elders, or those who are advanced in age and virtue."

The Honorable Individuals

The five venerable ones, as well as those who are older, wiser, and more endowed, are respected. Stated differently, the venerable are individuals who can bestow merit, instruction, trade, wisdom, riches, and position while rescuing others from danger and difficulties. Buddha advised us to respect elders and take advice from those who have more life experience. Giving honor to people who deserve it is a great human trait. People who are older than we are, as well as those who hold a higher spiritual position than us, deserve our respect. Chanmyay sayadaw instructs us to treat the Triple with respect in this regard. Paying respect to individuals such as gems, professors, parents, elderly spiritual leaders, holy figures, and people with superior attributes is truly a blessing. The following is how Ashim Janakabhivamsa clarified the concept of reverence and venerable ones:

Respect entails reverence and attentiveness. The Triple Gems, monks abiding by the precepts of holiness, educators, parents, and the elderly in both rank and quality are the revered ones. Here, the term "aspect" refers to the superabundance world attribute, which includes morality, moral practice, mental justice, and knowledge. Those who are older than a day, an hour, or a minute are considered seniors. However, seniority in



monastic years, rather than age, is what counts among ordained monks. Saying In his Manual of *Mangala Sutta*, Saying Shwe Hintha Sayadaw listed ten categories of respect. They're:

1. respect paid to Buddha
2. respect paid to Dhamma
3. respect paid to Sargha
4. respect paid to Sikkhæ
5. respect paid to Sammædhi
6. respect paid to Appamæda
7. respect paid to the Patisandhaya
8. respect paid to the Hiri
9. respect paid to the Uttapa
10. Mutual respect among people.

Reverence' Plays a Crucial Part in Social Relations:

The culture of Myanmar is characterized by a deep sense of respect. In Myanmar, social interactions between people follow the beatitude of reverence. Respect for others is a prerequisite for receiving respect from them. Others will be reluctant to respect you if you are not willing to respect them. Regarding the notion of respect that the Buddha spoke upon in his sutta, the *Mangala Sutta*. There are thirty-eight excellent blessings in this sutta. *Garova Mangala* is a well-known *Mangala*. Paying respect to those who deserve it to people who merit reverence or respect is known as *Garava Mangala*. Due to the nation's current state of peace and wealth, people frequently ignore their social responsibilities. They forget to appreciate one another as they grow conceited and self-satisfied. This *Garava Mangala* holds special significance for those in positions of authority, wealth, and responsibility. Respect from such individuals is extremely important and highly prized. Therefore, showing respect involves showing it not only to one's elders and superiors but also to those who are younger and subordinates. Younger folks are also highly respected by older people. Despite its age, the proverb "Pay respects to the elders, regard highly of the ones of equal same age and feel kindly to the younger" is still sage counsel that ought to be followed. This proverb has a lot of wisdom, encouraging individuals to maintain the love and friendship amongst friends. Thus, this age-old proverb serves as a bright beacon illuminating the path toward harmonious cohabitation in human civilization.

Even if he may be younger, a person who is superior in upholding morality, fairness of thought, and wisdom is respected. Respect for individuals who possess excellent qualities is a necessary. Everyone who upholds moral standards in society has an obligation to show respect to those who deserve it. Respect must be extended to senior citizens in the same manner that it is to people with excellent qualities. This is the societal code of behavior that all races, nations, religions, and geographical areas agree upon. Unity, peace, and happiness are predicated on respect for elders. Respect for one another is essential for societal harmony and prosperity. Respect between the young and the old can destroy the lovely, tranquil country that has been established. Furthermore, we are all aware that we must honor the bhikkhu and show reverence for our elders. Respect for one another among the populace is crucial to the preservation and security of our nation. Whether or not the seniors have admirable morals, the younger must nonetheless

show respect for them. For this reason, it is crucial that individuals in positions of authority and wealth observe *Garava* (reverence) *Mangala*.

CONCLUSION

Social conventions are concerned with how children regard their parents, how students respect their teachers, how juniors respect seniors in age, and how people respect one another. The *Mangala Sutta* is the cornerstone of Myanmar culture, which the people of Myanmar take great pride in, and they must learn and remember it. Unfortunately, young people are becoming less and less aware of morality, which is causing them to grow apart from the noble *Mangala Sutta*. The respect that is the cornerstone of culture will eventually erode if individuals close contact with the *Mangala Sutta*. When that day arrives, everyone must strive to live in harmony with the same culture by embracing the moral precept that "The crow respects the Pheasant, and the pheasant respects the crow," in line with the *Mangala Sutta's* teachings on respect. However, the majority of young people nowadays disregard the need for respect in everyday life. As a result, moral responsibility has declined in the modern era. Every race and religion prioritizes respect and reverence in every location and nation. As a result, individuals are putting the *Mangala Sutta's* emphasis on respect and reciprocal regard into practice. At home is where good quality should begin. It is necessary to teach kids to respect their parents. The kids should revere their parents whenever they get home or when they're departing. In a same vein, educators ought to instil in their pupils a daily job of respecting people who are deserving of it for their physical and spiritual development. he keys to maintaining harmony, friendship, and peace in society is the breeding and spreading of young people who are polite and respectful of others. regard is due to the one who demonstrates regard, not to the respected oxie. It is discovered that parental filial love has decreased in modern times. The social world is collapsing because of this. Honor his high regard. In order to maintain family relationships and strong friendships among friends, it is crucial to adopt the social attitude of extending love and ending hatred. Therefore, it might be argued that treating people with respect is the proper path to daily happiness and serenity. Respect is therefore crucial to social interactions.

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THE ROLE OF BUDDHISM IN MYANMAR'S CULTURAL IDENTITY

Ardiccaramsi¹, Dr. Yeshpal²

¹PhD Research Scholar, Samrat Ashok Subharti School of Buddhist Studies, Swami Vivekanand Subharti University, Meerut-250002

²Assistant Professor, Department of Languages, Swami Vivekanand Subharti University, Meerut-250002

ABSTRACT

Myanmar's cultural identity is deeply intertwined with Buddhism, shaping its societal norms, values, and practices for centuries. This paper explores the multifaceted relationship between Buddhism and Myanmar's cultural identity, delving into historical, social, and religious dimensions. Drawing upon scholarly research and cultural analysis, it investigates the pivotal role of Buddhism in shaping Myanmar's ethos, rituals, art, and literature. Moreover, it examines the interplay between Buddhism and other cultural elements, such as ethnicity and politics, elucidating how Buddhism has influenced and been influenced by various facets of Myanmar's diverse cultural landscape. Through a comprehensive examination, this paper illuminates the intricate dynamics through which Buddhism continues to mold and define Myanmar's rich cultural identity.

KEYWORDS: Buddhism, Myanmar, Cultural Landscape, Elements

INTRODUCTION

Buddhism stands as a cornerstone of Myanmar's cultural identity, weaving through the fabric of its society, history, and daily life. As one of the world's most devout Buddhist nations, Myanmar's affiliation with the religion dates back over two millennia, shaping its ethos, values, and traditions. Understanding the profound influence of Buddhism in Myanmar is essential to comprehending the nation's rich cultural tapestry.

Myanmar, a land of breathtaking landscapes, diverse ethnicities, and vibrant traditions, stands as a testament to the enduring influence of Buddhism on cultural identity. Nestled in the heart of Southeast Asia, Myanmar's history is intertwined with the spread and evolution of Buddhism, shaping the very essence of its society, values, and way of life. From the ancient kingdoms of Bagan to the modern-day Republic, Buddhism has been a guiding force, permeating every facet of Myanmar's cultural landscape.

The Role of Buddhism in Myanmar's Cultural Identity transcends mere religious affiliation; it is a complex tapestry interwoven with history, spirituality, and communal ethos. As one of the world's most devout Buddhist nations, Myanmar's connection to Buddhism spans over two millennia, establishing it as a cornerstone of national identity. The teachings of the Buddha have not only shaped individual belief systems but have also served as a unifying thread that binds together the diverse ethnic groups that call Myanmar home.

To explore the role of Buddhism in Myanmar's cultural identity is to embark on a journey through time, tracing the evolution of religious practices, rituals, and traditions that have endured centuries of change and upheaval. It is an exploration of the spiritual heartbeat that pulses through Myanmar's bustling cities and tranquil villages, embodied in the saffron-robed monks who serve as custodians of Buddhist wisdom and compassion.

In this comprehensive exploration, we delve deep into the historical foundations of Buddhism in Myanmar, tracing its roots from the ancient interactions with Indian missionaries to the establishment of *Theravada* Buddhism as the predominant faith. We unravel the spiritual significance of Myanmar's sacred sites, from the towering stupas of Bagan to the gilded splendor of the Shwedagon Pagoda, and examine how these architectural marvels serve as tangible manifestations of Buddhist devotion and cultural pride.

Moreover, we navigate the intricate intersections between Buddhism and Myanmar's cultural expressions, from traditional art forms and festivals to the moral values that underpin everyday life. We delve into the ethical principles of compassion, generosity, and mindfulness that form the bedrock of Buddhist teachings, shaping social norms and interpersonal relationships in Myanmar's tightly-knit communities.

Historical Foundations

The roots of Buddhism in Myanmar delve deep into antiquity, tracing back to the illustrious era of Emperor Ashoka during the 3rd century BCE. It was during this epoch that the emissaries of Ashoka, bearing the profound teachings of the Buddha, traversed the terrains of Southeast Asia, disseminating the message of enlightenment and compassion. Myanmar, then known as the Kingdom of Bagan, stood as a receptive recipient of these sacred doctrines, embracing Buddhism fervently during the transformative reign of King Anawrahta in the 11th century. This pivotal period marked a significant turning point in Myanmar's cultural odyssey, as the nation wholeheartedly adopted Buddhism, thus sculpting the contours of its cultural identity.

The ascendancy of Buddhism in Myanmar ushered in a new era of spiritual fervor and societal transformation. The establishment of *Theravada* Buddhism, the oldest surviving



branch of the Buddha's teachings, served as the cornerstone of Myanmar's religious ethos. This profound commitment to *Theravada* Buddhism permeated every facet of Myanmar's societal fabric, imbuing its cultural, social, and political landscape with the indelible imprint of the Dharma.

The ascendancy of Theravada Buddhism in Myanmar heralded not only a spiritual renaissance but also a renaissance in cultural expression. The architectural marvels of Bagan, adorned with towering stupas and intricate carvings, stand as enduring testaments to Myanmar's devotion to the Buddhist faith. These sacred edifices served not only as places of worship but also as centers of learning and cultural exchange, fostering a vibrant artistic tradition that continues to captivate hearts and minds to this day.

Moreover, the advent of *Theravada* Buddhism engendered a profound moral and ethical framework that permeated Myanmar's social and political institutions. The principles of compassion, mindfulness, and ethical conduct became guiding beacons for Myanmar's populace, shaping interpersonal relationships, governance structures, and societal norms. The practice of *dana*, or generosity, flourished, as individuals and communities alike embraced the altruistic spirit of Buddhist teachings, thus fostering a culture of communal support and benevolence.

However, the establishment of *Theravada* Buddhism in Myanmar was not without its challenges. The interplay between religion and politics often gave rise to tensions and conflicts, as competing interests vied for influence and power. Moreover, the rigid hierarchies within the monastic order sometimes engendered divisions and schisms within the Buddhist community, challenging the unity and cohesion of Myanmar's spiritual fabric.

Yet, despite these challenges, the enduring legacy of *Theravada* Buddhism continues to shape Myanmar's cultural identity in profound and transformative ways. From the tranquil monasteries nestled amidst verdant hills to the bustling pagodas that dot the urban landscape, the spiritual heritage of Buddhism is omnipresent, serving as a source of solace, inspiration, and unity for Myanmar's diverse populace. The establishment of *Theravada* Buddhism in Myanmar represents a pivotal chapter in the nation's cultural trajectory, shaping its spiritual, social, and political landscape for centuries to come. As Myanmar navigates the complexities of modernity and globalization, the timeless wisdom of the Buddha's teachings remains a guiding light, illuminating the path towards compassion, wisdom, and enlightenment in the ever-changing currents of Myanmar's cultural evolution.

Spiritual Heartbeat

The profound influence of Buddhism in Myanmar transcends mere religious observance; it embodies a way of life deeply ingrained in the collective consciousness of its people. Buddhism serves as a guiding beacon, illuminating the path towards enlightenment and moral virtue for millions across the nation. At the heart of Myanmar's Buddhist tradition lies the

revered figure of the monk, whose saffron robes and serene countenance symbolize the embodiment of Buddhist teachings and values.

Monks hold a central and revered role in Myanmar's society, revered not only for their spiritual wisdom but also for their altruism and selflessness. As custodians of Buddhist teachings, monks play a multifaceted role, offering spiritual guidance, education, and social welfare to their communities. Their presence is ubiquitous, with the sight of saffron-robed monks, carrying their alms bowls, a common and cherished sight amidst the bustling cities and tranquil countryside of Myanmar.

The daily routines of monks, marked by meditation, prayer, and acts of compassion, serve as a source of inspiration and moral guidance for the wider populace. Through their teachings and exemplary conduct, monks impart the values of compassion, mindfulness, and ethical conduct, thus fostering a culture of kindness, generosity, and spiritual growth within Myanmar's communities.

Moreover, monks serve as pillars of support for the less fortunate, offering solace and assistance to those in need. Monastic institutions play a crucial role in providing education, healthcare, and social services to marginalized groups, thus embodying the spirit of compassion and social welfare espoused by Buddhist teachings.

The presence of monks in Myanmar's society is not merely symbolic; it is a living testament to the nation's deep-rooted spiritual heritage and commitment to the Buddhist path. Their unwavering dedication to the pursuit of enlightenment and the alleviation of suffering serves as a constant reminder of the transformative power of Buddhist practice in shaping individual lives and societal values. The presence of monks in Myanmar's society serves as a tangible manifestation of the enduring legacy of Buddhism, permeating every aspect of life with its teachings of compassion, wisdom, and inner peace. As Myanmar continues to navigate the complexities of modernity and globalization, the timeless wisdom of the monk's robes and the alms bowl remains a source of inspiration and guidance, illuminating the path towards a more compassionate and enlightened society.

Cultural Expressions

Myanmar's cultural identity is a tapestry intricately woven with the threads of Buddhist rituals, festivals, and artistic expressions. The nation's rich heritage is palpably intertwined with the spiritual practices and traditions that emanate from its devout Buddhist populace. From the iconic pagodas that punctuate the landscape to the captivating traditional dances performed in reverence during religious ceremonies, Buddhism serves as a fertile ground for artistic exploration and cultural celebration.

Among the most illustrious symbols of Myanmar's deep-seated devotion to Buddhism stands the Shwedagon Pagoda in Yangon. Adorned with layers of gleaming gold leaf and adorned with precious jewels, this majestic monument commands attention with its awe-inspiring beauty and profound spiritual



significance. Rising gracefully into the sky, the Shwedagon Pagoda serves as a beacon of faith, attracting pilgrims and tourists alike from far and wide who are drawn to its sacred aura and timeless allure.

The Shwedagon Pagoda is not merely a physical structure; it is a living testament to Myanmar's unwavering commitment to the Buddhist path. Its towering spires and intricate architecture embody the nation's reverence for the Buddha's teachings and serve as a focal point for communal worship and spiritual pilgrimage. Each shimmering detail, meticulously crafted and lovingly maintained, reflects the deep-seated faith and devotion of Myanmar's people, echoing through the ages as a testament to their enduring spiritual heritage.

Moreover, the Shwedagon Pagoda serves as a hub of cultural activity and artistic expression, providing a canvas for a myriad of creative endeavors. From traditional music performances to vibrant festivals that celebrate Myanmar's diverse cultural tapestry, the pagoda's sacred grounds resonate with the joyful energy of communal celebration and spiritual communion. Through these artistic expressions, Myanmar's cultural identity finds vibrant expression, rooted in the timeless teachings of Buddhism and infused with the spirit of creativity and devotion. The Shwedagon Pagoda stands as a shimmering jewel in Myanmar's cultural crown, a testament to the profound influence of Buddhism on the nation's ethos, values, and artistic expressions. Its radiant presence serves as a beacon of hope and inspiration, inviting all who behold it to embark on a journey of spiritual discovery and cultural appreciation. As Myanmar continues to evolve and embrace the challenges of the modern world, the Shwedagon Pagoda stands as a timeless symbol of the nation's enduring faith and cultural resilience, illuminating the path towards a brighter and more harmonious future.

Moral Compass

Central to Buddhist philosophy are the principles of compassion, mindfulness, and ethical conduct, which serve as moral compasses for Myanmar's people. The practice of *dana* (generosity) is deeply ingrained in Myanmar's society, with individuals and communities coming together to support temples, monasteries, and charitable causes. The concept of *karma*, the belief in the consequences of one's actions, underscores the importance of leading a virtuous life and contributing positively to society.

Challenges and Resilience

Despite Buddhism's profound influence, Myanmar's cultural landscape has faced challenges in recent years, including political unrest, ethnic tensions, and religious conflicts. The Rohingya crisis, in particular, has tested the nation's commitment to Buddhist principles of compassion and tolerance, highlighting the complex interplay between religion, politics, and identity.

However, amidst these challenges, Buddhism continues to serve as a source of strength and resilience for Myanmar's people, fostering unity, compassion, and a sense of shared heritage. As the nation navigates the complexities of modernity

and globalization, the enduring legacy of Buddhism remains a guiding force, shaping Myanmar's cultural identity for generations to come.

CONCLUSION

In conclusion, the role of Buddhism in Myanmar's cultural identity is indeed profound and multifaceted, transcending mere religious practice to become an intrinsic part of the nation's history, values, and collective consciousness. From its ancient origins to its contemporary manifestations, Buddhism serves as a guiding light, illuminating the path towards compassion, wisdom, and social harmony in Myanmar's diverse and vibrant society.

Through centuries of devotion and spiritual practice, Buddhism has left an indelible mark on Myanmar's cultural landscape, shaping its ethos and influencing its social structures. The teachings of the Buddha resonate deeply within the hearts and minds of Myanmar's people, instilling a sense of moral responsibility, empathy, and reverence for all living beings.

Moreover, Buddhism serves as a unifying force in Myanmar, bridging divides of ethnicity, language, and geography to create a shared sense of identity and belonging. The rituals, festivals, and traditions associated with Buddhism provide opportunities for communal celebration and reflection, fostering bonds of solidarity and mutual respect among diverse communities.

As Myanmar navigates the complexities of the modern world, the timeless wisdom of Buddhism continues to offer guidance and inspiration, reminding its people of the importance of compassion, mindfulness, and ethical conduct in all aspects of life. In an increasingly interconnected and diverse society, Buddhism serves as a spiritual beacon, guiding individuals and communities towards a path of inner peace and social harmony.

In essence, the role of Buddhism in Myanmar's cultural identity is not static but dynamic, evolving alongside the changing needs and aspirations of its people. As Myanmar embraces the challenges and opportunities of the 21st century, the enduring legacy of Buddhism remains a source of strength and resilience, shaping the nation's collective journey towards a brighter and more compassionate future.

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EXPLORING THE SOCIO-DIMENSION OF BUDDHISM: A PATH TO HARMONY AND COMPASSION

Varanyana¹, Dr. Yeshpal²

¹PhD Research Scholar, Samrat Ashok Subharti School of Buddhist Studies, Swami Vivekanand Subharti University, Meerut-250002

²Assistant Professor, Department of Languages, Swami Vivekanand Subharti University, Meerut-250002

ABSTRACT

Buddhism, rooted in the teachings of Siddhartha Gautama, offers profound insights into the socio-dimensions of human existence. Central to Buddhist philosophy is the cultivation of compassion, wisdom, and ethical conduct, which are seen as essential for creating harmonious and just societies. This research paper delves into the socio-dimension of Buddhism, examining its teachings on social justice, equality, and community engagement. Drawing upon Buddhist scriptures, historical examples, and contemporary perspectives, this paper elucidates how Buddhist principles can inspire individuals and societies to foster greater harmony, compassion, and social responsibility.

KEYWORDS: Buddhism, socio-dimension, compassion, harmony, social justice

INTRODUCTION

Buddhism, originating from the teachings of Siddhartha Gautama, offers a holistic worldview that extends beyond personal liberation to encompass the well-being of society as a whole. Central to Buddhist philosophy is the recognition of interconnectedness and the imperative to alleviate suffering in all its forms. This research paper explores the socio-dimension of Buddhism, examining its teachings and practices related to creating harmonious and compassionate societies.

The Ethical Foundations of Buddhism

At the heart of Buddhism lie the Four Noble Truths and the Noble Eightfold Path, which serve as ethical guidelines for individual conduct and societal harmony. The Four Noble Truths elucidate the nature of suffering and its cessation, emphasizing the importance of recognizing and addressing the causes of suffering. The Noble Eightfold Path, comprising right understanding, intention, speech, action, livelihood, effort, mindfulness, and concentration, provides a framework for ethical living and social engagement.

The Four Noble Truths

The Four Noble Truths serve as the cornerstone of Buddhist philosophy and ethics. They elucidate the nature of suffering (dukkha), its causes, its cessation, and the path leading to its cessation. The first truth acknowledges the universal presence of suffering in human existence, encompassing physical, emotional, and existential dimensions. The second truth identifies the causes of suffering, including craving, ignorance, and attachment. The third truth offers hope by affirming the possibility of overcoming suffering through the cessation of its causes. Finally, the fourth

truth presents the Noble Eightfold Path as the means to achieve liberation from suffering and attain lasting peace and happiness.

The Noble Eightfold Path

The Noble Eightfold Path outlines the ethical and spiritual practices necessary for transcending suffering and achieving enlightenment. It comprises eight interconnected aspects: right understanding, intention, speech, action, livelihood, effort, mindfulness, and concentration. These factors encompass ethical conduct, mental discipline, and wisdom, providing a comprehensive framework for ethical living and spiritual growth. By cultivating these qualities, individuals not only alleviate their own suffering but also contribute to the well-being of society as a whole.

Application in Daily Life

The ethical principles of Buddhism find practical application in various aspects of daily life. Right speech encourages truthful, kind, and compassionate communication, fostering harmony and understanding in interpersonal relationships. Right action promotes nonviolence, integrity, and respect for all living beings, laying the foundation for a just and compassionate society. Right livelihood advocates for ethical and sustainable means of earning a living, promoting social and environmental responsibility. Through the practice of mindfulness and concentration, individuals develop self-awareness, emotional resilience, and empathy, leading to greater personal well-being and social harmony.

Social Justice and Equality in Buddhist Thought

Buddhism advocates for social justice and equality, challenging hierarchical structures and systems of oppression. The teachings



of non-violence (ahimsa), compassion (karuna), and loving-kindness (metta) underscore the importance of treating all beings with dignity and respect. Buddhist scriptures contain numerous stories and teachings that highlight the Buddha's advocacy for social reform and his concern for the welfare of marginalized communities.

Non-Violence and Compassion in Buddhist Thought

Central to Buddhist ethics is the principle of non-violence (ahimsa), which extends beyond mere abstention from physical harm to encompass compassion and empathy towards all sentient beings. The Buddha's teachings emphasize the cultivation of loving-kindness (metta) and compassion (karuna) as antidotes to greed, hatred, and delusion. Through practices such as the cultivation of the Brahmaviharas (divine abodes), Buddhists seek to develop a heart of boundless love and compassion for all beings, irrespective of social status, race, or creed.

Advocacy for Social Justice

Buddhist scriptures contain numerous stories and teachings that highlight the Buddha's advocacy for social reform and his concern for the welfare of marginalized communities. The Buddha challenged hierarchical structures and systems of oppression, advocating for the rights of women, the poor, and other marginalized groups. Examples such as the Buddha's acceptance of outcasts into the monastic order and his teachings on the equality of all beings underscore Buddhism's commitment to social justice and equity.

Contemporary Relevance

In the contemporary world, Buddhist principles of social justice and equality continue to inspire activism and advocacy for marginalized communities. Buddhist organizations and communities around the world are engaged in various social justice initiatives, including poverty alleviation, environmental sustainability, and human rights advocacy. Through practices such as engaged Buddhism, practitioners seek to apply Buddhist teachings to address systemic injustices and promote social change.

Buddhist Monastic Communities and Charitable Activities

Buddhist monastic communities, known as the sangha, have long been at the forefront of promoting social welfare and community engagement. Monasteries serve as centers of learning, meditation, and charitable activities, providing support to the needy and fostering a sense of belonging and solidarity within communities. Through initiatives such as almsgiving, education, and healthcare, Buddhist monastics exemplify the principles of compassion and service, inspiring others to contribute to the welfare of society.

Almsgiving and Material Support

One of the central practices of Buddhist monastic communities is almsgiving, wherein lay supporters offer material support to sustain the monks and nuns in their practice. This tradition not only provides for the basic needs of the sangha but also cultivates

a sense of interconnectedness and mutual support within the community. By receiving alms, monastics demonstrate humility and gratitude, while lay supporters accrue merit through their acts of generosity.

Education and Spiritual Guidance

Monasteries serve as centers of learning and spiritual guidance, offering teachings on Buddhist philosophy, meditation, and ethics. Buddhist monastics play a vital role in transmitting the teachings of the Buddha to both monastic and lay communities, fostering spiritual growth and moral development. Through educational programs, retreats, and Dharma talks, the sangha empowers individuals to cultivate wisdom, compassion, and inner peace.

Healthcare and Social Services

Buddhist monastic communities also engage in providing healthcare and social services to those in need. Monasteries often operate clinics, hospitals, and hospices, offering medical care and support to the sick, elderly, and marginalized. Additionally, monastics may organize outreach programs, disaster relief efforts, and community service projects to address broader social issues and alleviate suffering in society.

Inspiring Compassionate Action

Through their charitable activities, Buddhist monastics inspire others to engage in compassionate action and service to others. By embodying the principles of generosity, kindness, and selflessness, the sangha serves as a living example of the transformative power of compassion in action. Their efforts not only alleviate immediate suffering but also contribute to the cultivation of a more compassionate and equitable society.

Buddhist monastic communities, through their charitable activities and commitment to compassionate action, embody the timeless values of Buddhism and serve as beacons of light in a world often beset by suffering and strife. By providing material support, spiritual guidance, and healthcare services, the sangha exemplifies the transformative potential of compassion and selflessness in fostering individual well-being and social welfare. As we navigate the complexities of the modern world, the compassionate heart of the sangha continues to inspire and uplift, reminding us of the inherent goodness and interconnectedness of all beings.

Buddhism and Contemporary Social Issues

In the modern world, Buddhism continues to offer valuable insights into addressing contemporary social issues such as poverty, inequality, environmental degradation, and conflict. Mindfulness practices, derived from Buddhist meditation techniques, have gained widespread recognition for their effectiveness in promoting mental well-being, resilience, and empathy. Moreover, Buddhist-inspired movements for social justice, environmental activism, and interfaith dialogue



exemplify the enduring relevance of Buddhist principles in addressing pressing societal challenges.

Mindfulness Practices for Mental Well-being

One of the most widely recognized contributions of Buddhism to contemporary society is the promotion of mindfulness practices for mental well-being. Derived from Buddhist meditation techniques, mindfulness has gained widespread recognition for its effectiveness in reducing stress, enhancing resilience, and fostering empathy. Through practices such as mindful breathing, meditation, and mindful awareness, individuals can develop greater self-awareness, emotional regulation, and a deeper sense of connection with others.

Social Justice Movements and Buddhist Activism

Buddhist-inspired movements for social justice have emerged around the world, advocating for the rights and dignity of marginalized communities. Drawing on Buddhist principles of compassion, non-violence, and interdependence, these movements address issues such as poverty, inequality, and discrimination. Examples include engaged Buddhism, which emphasizes the importance of applying Buddhist teachings to address social and environmental injustices, and Buddhist-based community organizing efforts that seek to empower marginalized communities and promote systemic change.

Environmental Activism and Buddhist Ethics

Buddhism's teachings on interconnectedness and environmental ethics have inspired a growing movement for environmental activism within Buddhist communities. Recognizing the interconnectedness of all beings and the importance of protecting the natural world, Buddhists are increasingly engaged in initiatives such as reforestation projects, sustainable living practices, and advocacy for environmental policies. By promoting ecological awareness and responsible stewardship of the planet, Buddhism contributes to efforts to address environmental degradation and mitigate the impacts of climate change.

Interfaith Dialogue and Collaboration

Buddhism promotes interfaith dialogue and collaboration as a means of fostering understanding, compassion, and cooperation among diverse religious and cultural traditions. Through initiatives such as interfaith peacebuilding, dialogue, and mutual cooperation, Buddhists work alongside people of other faiths to address common challenges and promote peace and harmony in society. By transcending religious boundaries and embracing shared values of compassion and social justice, Buddhism contributes to efforts to build a more inclusive and harmonious world.

Buddhism's response to contemporary social issues demonstrates its enduring relevance and transformative potential in promoting individual well-being and societal harmony. Through mindfulness practices, social justice movements, environmental activism, and interfaith dialogue, Buddhism offers valuable

insights and practical solutions to address pressing challenges facing humanity. As we navigate the complexities of the modern world, the teachings and practices of Buddhism continue to inspire and guide us towards a more compassionate, just, and sustainable future.

CONCLUSION

The socio-dimension of Buddhism provides a rich tapestry of teachings and practices aimed at fostering harmony, compassion, and social responsibility. By embodying the ethical principles of Buddhism and engaging in acts of service and community building, individuals and societies can work towards creating a more just, equitable, and compassionate world. As we navigate the complexities of the modern age, the wisdom of Buddhism serves as a guiding light, inspiring us to cultivate greater awareness, empathy, and solidarity in our interactions with others and with the world around us.

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SMART CITY EMERGENCY COMMUNICATION OVER HILLY AND FOREST REGION WITHIN NETWORK COVERAGE

K. Madhumitha¹, R. Prakash², S. Sudha³, V. Hemalatha⁴

^{1,2,3}Student, Dept. of Computer Science and Engineering

⁴Associate Professor, Dept. of Computer Science and Engineering
N.S.N College of Engineering and Technology, Karur, India.

ABSTRACT

In remote areas with poor network coverage, like hilly or forested regions, communication during emergencies is challenging. To tackle this issue, a proposed system employs acoustic waves for communication. Using Radio Frequency generation, a Transmitter and Receiver facilitate acoustic wave transmission, enabling data communication. Magnetic waves integrated with acoustic waves enhance communication efficiency via Internet of Everything approach. This cost-effective and easily integrated RF module is ideal for emergency communication scenarios. Additionally, an emergency button allows individuals to initiate communication, offering an efficient solution to communication limitations in remote areas.

KEYWORDS: Arduino, RF transmitter, RF receiver, IOT, Sensor, GPS.

1. INTRODUCTION

The main objective of the system is to provide communication in hilly regions at emergency situations. Mostly communication cannot be provided in those area which is more interior where cellular connected or Tower connection will not be provided. Internet Of Things (IoT) involves connecting various physical objects and devices to the internet, enabling them to exchange data without direct human interaction. This approach provides numerous benefit such as accessing a wide range of information and services through devices like smartphones, laptops, and tablets. Additionally, it mentions the potential for extending these benefits to other physical objects and locations, making everyday tasks more convenient and efficient.

2. EXISTING SYSTEM

In an existing system for emergency communication, normal radiation tower-based processing can be implemented, where a normal process in a real-time environment can be created. In most of the survey, the real-time existence of frequency and radiation transmission can be maintained with emergency underwater level monitoring systems, which are taken as services in the literature survey. The normal range of communication can be achieved in the existing system, where it is not taken into consideration for the proposed system in an emergency. Mostly in the hilly regions, emergency problems cannot be identified, and emergency situation case data communication cannot be processed where it has been taken as a problem statement in the implementation. Thus, a smart monitoring system will eliminate this communication problem without our having to enhance.

Demerits

- Higher amount of radiation might cause cancer.
- Tower areas cannot be analyzed.
- High amount of tower implementation will proceed higher cost.
- Emergency data transmission or emergency information transmission cannot be made.

3. PROPOSED SYSTEM

In this system, a Radio Frequency based transmission of the data in emergency cases has been used. In the developed hardware part, the arduino is connected with RF transmitter and receiver. This make an intimation to the receiver regarding that the sender is in danger. The developed RF communication focuses with a transmitter and the receiver system combined on a frequency pattern. With a wide range of frequency the system with RF range fixed can transmit the data in emergency cases. Here GPS (Global Positioning System) gets the location of the person to the concern saver. This the complete system helps in easiest detection of the emergency situation in hilly region is done. Communication can be wide enough for the concern range where it will be most enough for the emergency processing system. Acoustic waves manner can be generated with electromagnetic generation system which will Travels the date of from one part of transmitter to the receiver side.

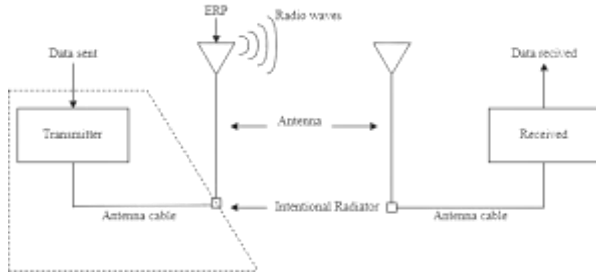


Fig.1 Transmitter and Receiver Architecture

Transmission Of Data: Sensors can be temperature sensors, movement sensors, dampness sensors, quality sensors and light sensors. These sensors, in conjunction with an association, permit us to consequently collect data from the environment, which, in turn, permits us to make more intelligent decisions. On a cultivate, consequently getting data about the soil dampness can tell agriculturists precisely when their crops need to be watered. Rather than watering as much (which can be a costly overuse of water system frameworks) or watering as little (which can be a costly misfortune for crops), the agriculturist can guarantee that crops get precisely the proper amount of water. This empowers ranchers to extend their trim surrender while diminishing their related costs.

Data Receiving: IOT is exceptionally recognizable, with machines getting data and then acting. The printer gets a record, and it prints it. The car gets a flag from the car keys, and the entryways open. The illustrations are endless. Whether it's as straightforward as sending the command "turn on" or as complex as sending a 3D show to a 3D printer, we know that machines are able to tell machines what to do from a distance.

Intension Radiator: In smart cities, emergency communication in hilly and forested regions within network coverage relies on Intentional Radiator (IR) technology. IR devices are strategically placed transmitters that emit signals with specific power levels and frequencies to ensure reliable communication over challenging terrain. These devices boost signal strength and optimize coverage, enabling seamless emergency communication even in rugged environments, helping authorities respond effectively to incidents and ensure public safety.

Antenna: In hilly and forested regions, traditional communication methods like cellular networks may have limited coverage due to terrain obstacles. Smart cities in such areas often utilize antenna systems strategically placed on high points to overcome these challenges. These antennas enhance network coverage and enable reliable emergency communication by extending the reach of signals over rugged terrain, ensuring that critical messages can be transmitted and received efficiently in times of need.

Radio Waves: In hilly and forested regions, traditional forms of communication like cellular networks may face challenges due to signal obstruction. However, radio waves can penetrate obstacles

like trees and terrain more effectively, making them suitable for emergency communication in such areas. By using radio waves, smart city emergency systems can maintain reliable communication even in rugged terrain, ensuring that critical information reaches first responders and citizens in need.

Merits

- The system will make an emergency communication in over hilly regions or villages.
- The RF transmitter and receiver can act as a intermediate communicator range of 100 kms with accuracy 82 percentage.

4. MODULES

- Network Creation.
- Emergency Push Button.
- Megnatic Resonance Transmission.
- Data Receiver.
- Location Anaysis.

Modules Description

Network Creation: There are numerous clusters in an arrangement for submerged information collection. Each cluster encompasses a door hub. Since the throughput at the portal increases with the decrease in transmission, whereas it diminishes within the moment-hop multi-access communication, this propels us to discover an optimal number of clusters within the submerged so as to achieve a maximum organized throughput with the chosen multi-access protocols within the two stages.

Emergency Button: The emergency button can be done with emergency case situation generation, where the emergency case situation can be alerted with the button interface system.

Magnetic Resonance Transmission: The magnetic resonant wireless power transfer in conducting medium and found out an optimal frequency for designing the system. In a conducting environment, the eddy current loss is generated by the high-frequency alternating currents in the coils. It is manifested by the increased radiation resistance of the resonator coil, which leads to a decrease in the quality factor, which reduces the wireless power transfer efficiency in the conducting medium.

Data Receiver: The receiver synchronization method is used to transmit the data through electromagnetic signals and acoustic waves. The synchronization process involves time-stamp network connectivity with area and note management. In this area, we ponder the execution of an adjusted receiver-synchronized S-Aloha, considering proliferation delay variance as a work of transmitter-receiver removal.

Location Analysis: Location analysis is the process by which the exact of the latitude and longitude values can be extracted. The extraction can be done with a GPS system where the location-based points are gathered from the map and the current



implementation of the location can be known. The system identifies this location and inputs it to the concern. LCD display at the receiver side

5. CONCLUSION

This system enables the transfer of vital emergency problem to the hub in reduced and packed format using limited bandwidth wireless network. This preference scheme is only intended for use by IEPS users to be able to place buttons with preference. Public emergency services, on the other hand, are intended for use by members of the general public to request services such as fire, police, and medical. They are often invoked by a short access code. The IEPS enables the use of public telecommunications by national authorities for emergency and disaster relief operations. It allows users, authorized by national authorities, to have access to the hub, while this service is restricted either due to damage, congestion or faults, or any combination of these. This Recommendation describes the functional requirements, features, access and the operational management of the IEPS.

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TUNING OF PHOTOCATALYTIC PERFORMANCE OF CrO₄-ZrO₂ NANOCOMPOSITE MATERIAL FOR THE EFFECTIVE DEGRADATION OF INDUSTRIAL DYES

K. Subashri

Ph.D Research Scholar, Department of Chemistry, Centre for Research and Evaluation, Bharathiar University, Coimbatore 641046, Tamilnadu, India.

ABSTRACT

Revolutionary nanocomposite material of CrO₄-ZrO₂ prepared by using a simple technique of coprecipitation and sonication. Prepared HR-SEM materials characterized with an EDX, HR-TEM, XRD, PL and UV-Vis DRS analysis. HR-SEM images demonstrate the prepared materials shown in spherical multi shaped chain structure. (EDX) analysis ensures the nanocomposite material presents of Cr, Zr and O. Analysis of X-ray diffraction studies shows that the synthesized material monoclinic in nature. The PL analysis and UV-Vis DRS analysis were very useful to explain catalytic activity of synthesized particles. This material nanocomposite increases Trypan Blue (TB) dye concentration photocatalytic activity of 1x10⁻⁴ solution at pH 7 Optimal CuO nanomatter. For higher CrO₄-ZrO₂ activity than ZrO₂, a possible mechanism is proposed for 365 nm under UV radiation. DSSCs analysis showed improved current output, short circuit industrial electrochemical application of CrO₄-ZrO₂ nanocomposite material and prepared CrO₄-ZrO₂ nanocomposite material to be stable and reusable to be concluded with electrochemical properties of synthetic colouration and natural dye.

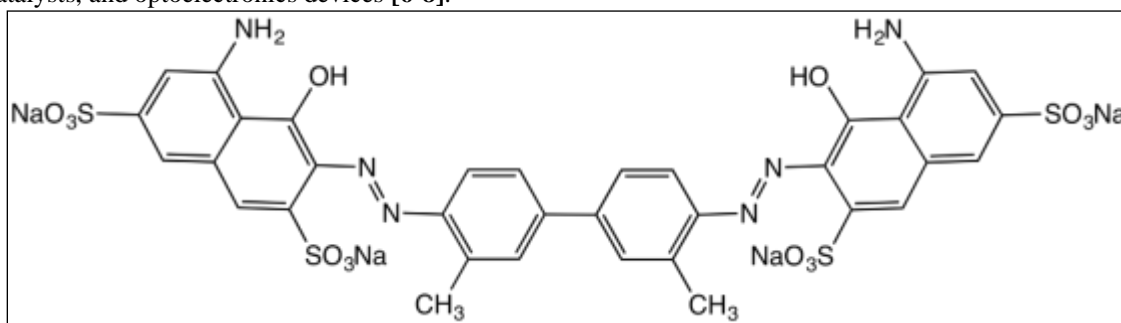
1. INTRODUCTION

Zirconium oxide nanocrystalline particles exhibit size-dependent properties, novel optical, electronic, magnetic, mechanical properties cannot be achieved using their bulk counterparts [1-4]. Zirconium oxide is one of the most intensively studied materials owing to its technologically important applications in oxygen sensors, fuel cells electrolytes, catalyst, and catalytic supports, metal oxides semiconductor devices, superior thermal and chemical stability, etc., [5]. Nanostructured Zirconium oxide powders can effectively degrade pollutants. Zirconium oxide can be widely used in the fabrication of structural ceramic devices, gas sensors, catalysts, and optoelectronics devices [6-8].

2. EXPERIMENTAL SECTION

2.1. Materials

The Zirconyl nitrate hydrate, Trypan Blue (TB), ((NH₄)₂Cr₂O₇·2H₂O, Citric acid, ammonia and ethanol solution and Fluorine doped Tin oxide FTO-plate) and Ruthenium dye (535-bisTBA, N719) solution, it was Sigma Aldrich reagent and was used as such All glassware was cleaned with acid and washed thoroughly with distilled water. Water is used as an experiment throughout. The Trypan Blue (TB) Chemical structure shown in Fig. 1.



2.2. Synthesis of CrO₄-ZrO₂ nanomaterial

(NH₄)₂Cr₂O₇·2H₂O were first dissolved with distilled water respectively, The resulting solution was added dropwise into Zirconyl nitrate hydrate with ammonia solution added in 1:2 ratio. Solution with anhydrous ethanol as solvent at room temperature under vigorous stirring 4 h until precipitate formed

was placed in sonication 20 min. The obtained precipitate was filtered and washed with distilled water and ethanol until alkali phases were removed from precipitation. Then the precipitate was collected and dried in oven at overnight. The resulting powder was finally calcined at 150, 300 and 450°C for 3 h. The prepared



CrO₄-ZrO₂ 450°C heat treatment at a higher photocatalytic activity.

2.3. Characterization of CrO₄-ZrO₂ Nanocomposite Material

Ultraviolet and visible (UV–vis) absorbance spectra were measured over a range of 800–200 nm with a Shimadzu UV-1650PC recording spectrometer using a quartz cell with 10 mm of optical path length. High resolution Scanning Electron Microscopy (HR-SEM) as well as Elementary Dispersive X-ray (EDX) evaluation experiments were performed on a FEI Quanta FEG 200 instrument with EDX analyzer facility at 25 °C. The nanoparticles size and structure verifications were done by Transmission Electron Microscopy (HR-TEM) making use of PHILIPS CM200. Each spectrum was recorded with an acquisition time of 18 s. XRD spectrum was recorded on the X'PERT PRO model X-ray diffractometer from Pan Analytical instruments operated at a voltage of 40 kV and also a current of 30 mA with Cu K α radiation.

Photoluminescence (PL) spectra at a room temperature were recorded using a Perkin-Elmer LS 55 fluorescence spectrometer. UV spectral measurements were done using a Hitachi-U-2001 spectrometer. Ultraviolet and visible (UV–vis) absorbance spectra were measured over a range of 800–200 nm with a Shimadzu UV-1650PC recording spectrometer using a quartz cell with 10 mm of optical path length. The antibacterial activity was studied by disc diffusion method; the test compound was dissolved in DMSO (200 mg/mL) for about half an hour. Commercially available drug disc, Ciprofloxacin (10 mg/ disc) was used as positive reference standard

2.4. Photocatalysis

The photocatalytic activities of CrO₄-ZrO₂ nanocomposite material were evaluated by the photodegradation of dye. The light irradiation at 365 nm. The reaction was carried out at ambient temperature (303 K). The experiment, aqueous suspensions of dye (40 mL, 1 × 10⁻⁴ M) and 0.080 g of photocatalyst were loaded in reaction tube of 50 mL capacity with a Prior 60 min in the irradiation, the suspension was magnetically stirred in dark to ensure the establishment of an adsorption or desorption equilibrium. The suspension was kept under constant air-equilibrated condition. At the intervals of given irradiation time. The suspension was measured spectrophotometrically within the theory to Beer–Lambert law limit.

3. RESULTS AND DISCUSSION

3.1. High-Resolution Scanning Electron Microscope Analysis (HR-SEM) & Energy Dispersive Analysis (EDX)

The scanning electron microscope (SEM) is a technique for high-resolution surface imaging. The texture and morphology of the catalyst are critical parameters that influence photocatalytic activity. **Figure 3.1 (a-c)** depicts a close up and an overview of the sample. Obviously. The diameter of these particles is approximately 4 nm, as shown in **Fig.3.1**. Anandhan et al [9] created 8 nm Zirconium oxide nanoparticles with spherical morphology, smooth surfaces, and high catalytic and photochemical activity.

The morphology of prepared CrO₄-ZrO₂ was annealed for three hours at 450 °C. The prepared CrO₄-ZrO₂ nanocomposite material has a spherical-like 3D structure. CrO₄-ZrO₂ nanocomposite material is uniformly distributed on the surface of ZrO₂. Because of its high specific area, the prepared CrO₄-ZrO₂ nanocomposite material with such a structure and morphology is very useful in catalysis.

To determine the elemental composition of the synthesized CrO₄-ZrO₂ nanocomposite material, EDS analysis was performed. The EDS analysis reveals distinct peaks of Cr, O, and Zr atoms, indicating that CrO₄⁻ has been incorporated with ZrO₂. **Figure.3.1** depicts these findings. **d**.

3.2. HR-TEM Image

A TEM uses energetic electrons to provide morphological, compositional, and crystallographic information on samples. TEM images were used to examine the surface morphology of prepared CrO₄-ZrO₂. As shown in **Fig. 3.2.a**, the sample has nano square structures that resemble spherical shapes with agglomeration, and the diameter of the nano particles is approximately 100 nm. These nanocrystals are visible under magnification. Anandhan et al [10] created 100 nm spherical Tin oxide nanoparticles with electrical, optical, magnetic, high catalytic, and photochemical activity.

At 100 nm magnifications, **Figure 3.2.b** shows the well-resolved lattice fringes. The average particle size distribution is depicted in **Figure 3.2. c**. The **Figure 3.2. d** depicts a selected particle size of 0.21 nm. The particle size observed in TEM studies agrees well with the average size obtained from XRD results. Using the "Image J Viewer" software skills, the image profile and normal particle range distribution were determined.

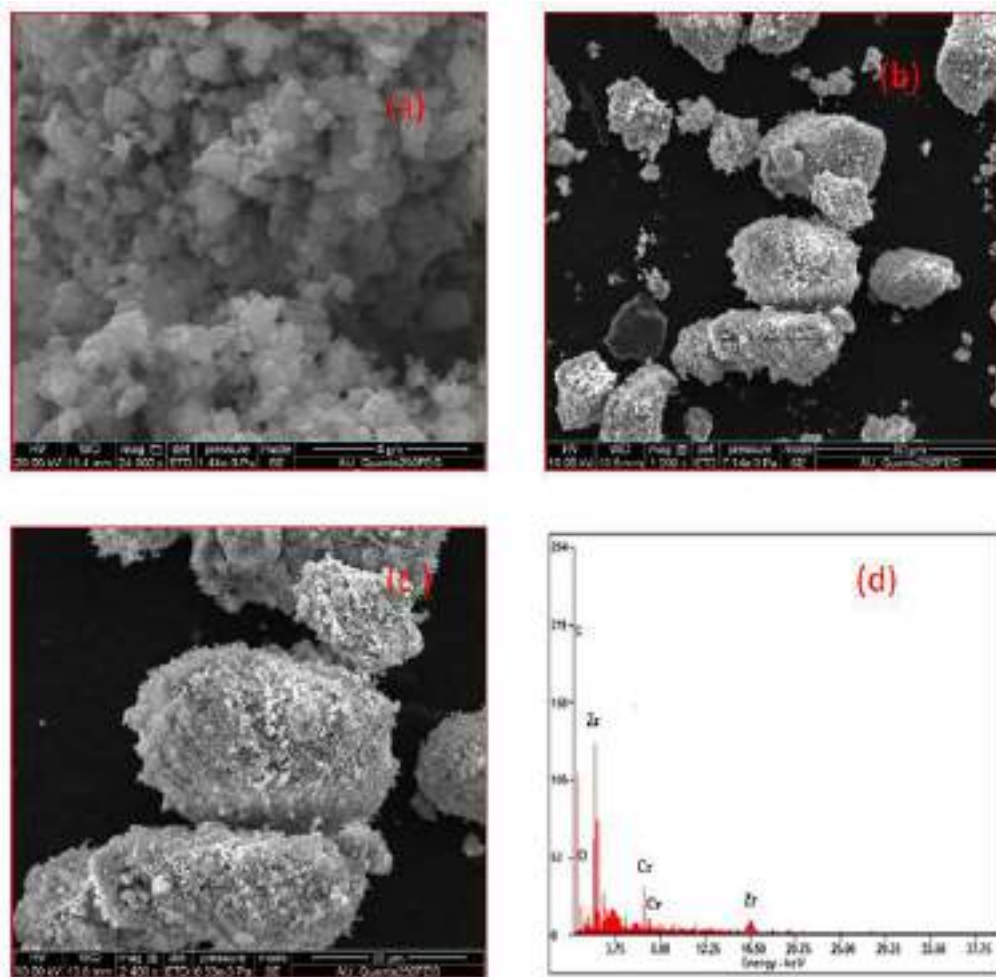


Figure 3.1. HR-SEM image and EDX analysis of $\text{CrO}_4\text{-ZrO}_2$ nanocomposite material

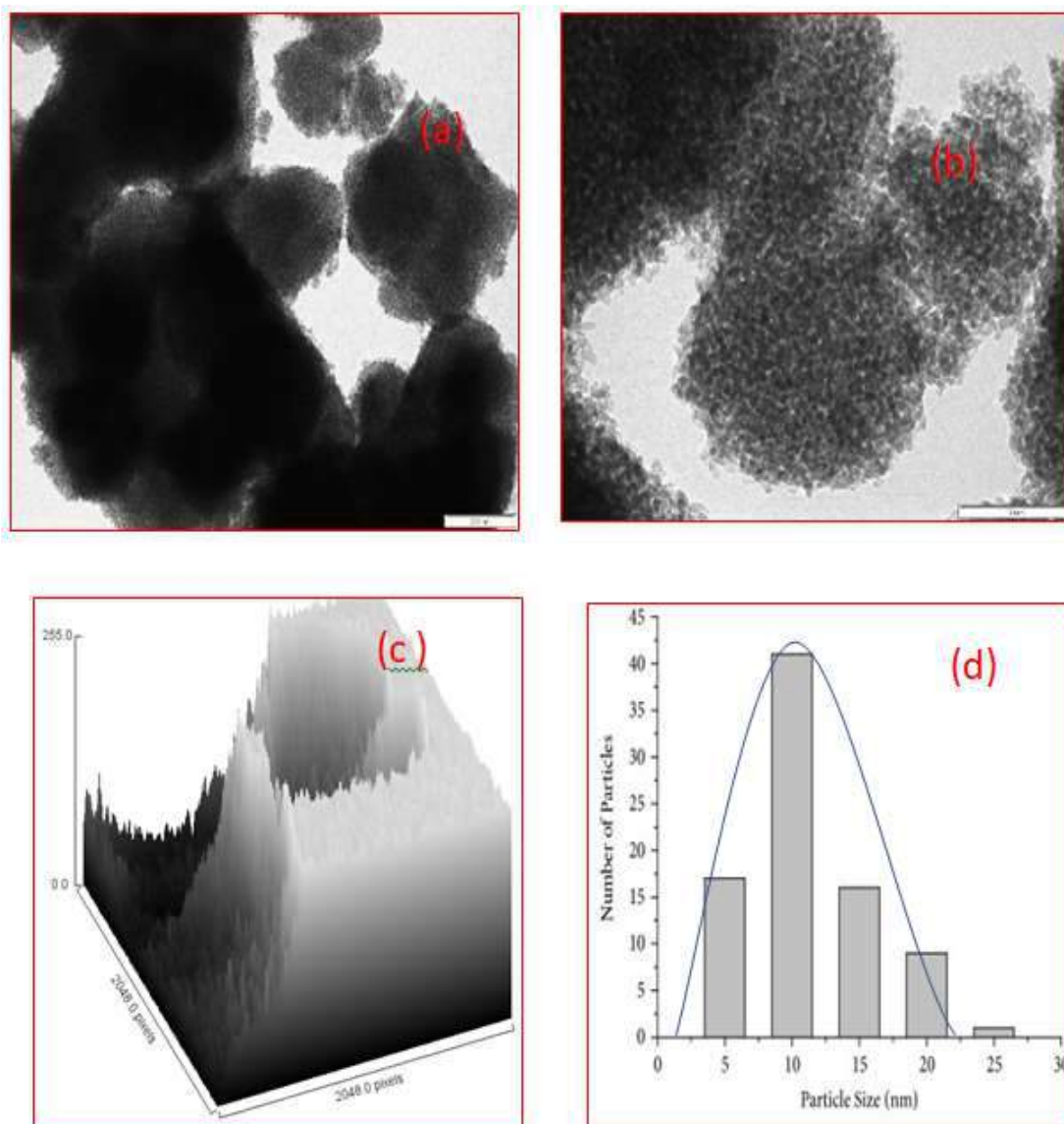


Figure.3.2. HR-TEM analysis of CrO₄-ZrO₂ nanocomposite material (a, b) Image CrO₄-ZrO₂ (c) Surface plot and (d) particle size in selected area highlighted fig (a)

3.3. XRD Analysis

The powder XRD study was carried out to find out crystalline structure of prepared CrO₄-ZrO₂ nanocomposite material. The **Figures 3.3a** and **b** displayed the XRD patterns of bare ZrO₂ and prepared CrO₄-ZrO₂ nanocomposite material. The XRD patterns of ZrO₂ and prepared CrO₄-ZrO₂ showed distinct peaks in the spectrum, the 2θ values at 24.04 °, 28.15 °, 30.00 °, 31.75 °, 35.20 ° and 50.28 ° representing (110), (111), (200), (212), (311) and (400) planes, respectively. As indexed in the figure, all the diffraction patterns indicate the monoclinic structure [JCPDS number 37-1484]. Tokeer Ahmed et al [11] synthesized zirconium oxide nanoparticles have monoclinic structure with 27nm particle size.

The peaks of the graph are in good agreement with the literature report. The XRD patterns of the CrO₄ show the new peaks at 33.30 and (101) plane for prepared CrO₄-ZrO₂ nanocomposite material. The average Crystallite size of nanocomposite material is calculated from in Debye-Scherrer formula,

$$D = K\lambda / \beta \cos \Theta \quad \dots (1.1)$$

Where, D = crystalline size of the nanocomposite material
 K = shape factor (or) Dimensionless constant
 λ = Wavelength of the X-rays
 β = the full line width at the half-maximum elevation of the main intensity peak (FWHM), and
 Θ = Bragg diffraction angle. Since this equation,



The crystalline size of ZrO_2 nanocomposite material and prepared CrO_4-ZrO_2 nanocomposite material was calculated about 27 nm and 19 nm correspondingly.

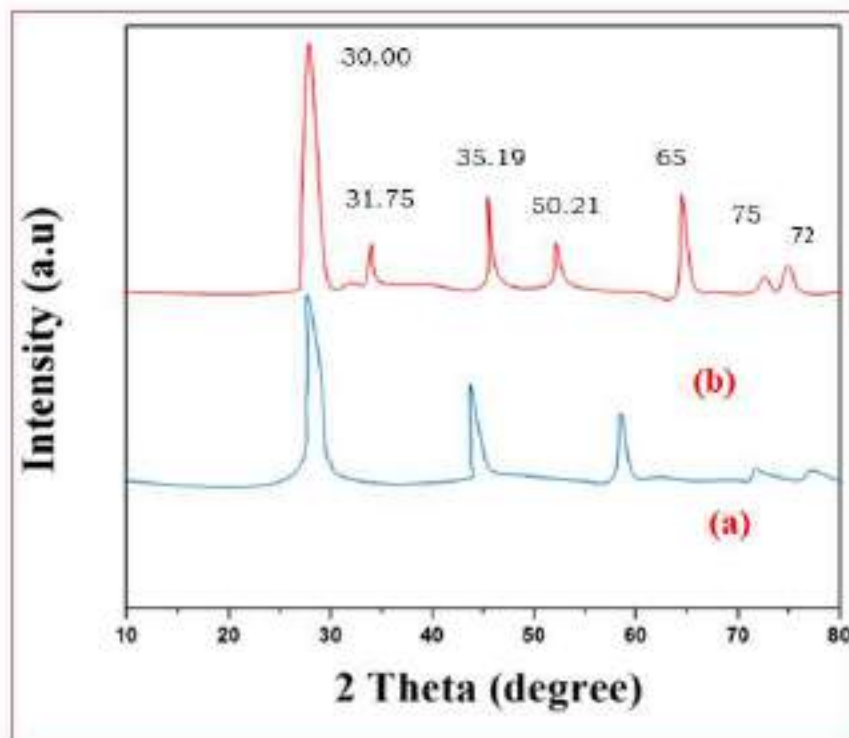


Figure. 3.3. XRD pattern of (a) ZrO_2 and (b) CrO_4-ZrO_2 nanocomposite material

3.4. PL Spectral Analysis

The electronic structure, transfer behaviour, and recombination rate of photoexcited electron-hole pairs in semiconductor materials can all be studied using photoluminescence spectroscopy (PL). Irradiative recombination of photoexcited electrons and holes produces the PL spectra. These charge carriers are crucial in determining the efficiency of photocatalytic activity.

As a result of the Photoluminescence spectra used to read the transfer, movement, and recombination processes of the photogenerated electron-hole pairs [12,13], the Photoluminescence spectra emission in nanocomposite material arises from the recombination of without charge carrier. **Figures 3.4. a and b** depict the PL spectrum of ZrO_2 and the prepared CrO_4-ZrO_2 nanocomposite material, with excitation wavelengths of 320 and 435 nm, respectively. It is primarily composed of two

emission bands: a strong blue emission band at 320 nm and a green emission band at 435 nm. Feng Gu et al [14] reported a blue band at approximately 423 nm, as well as a green band at 535 nm; these values agree with the above result.

The intensity of CrO_4^- doped ZrO_2 is lower than that of pure ZrO_2 , implying that the electron-hole recombination rate is much lower and the separation efficiency is much higher in the doped sample. The PL emission bands observed in current ZrO_2 may be caused by transitions from surface trap states in the conduction band to lower energy levels near the valance band. This is consistent with the findings reported in the literature [15,16]. The small particle size was the main reason for the broad fluorescence band, according to the very narrow particle size distribution [17,18]. The bands observed at 220 nm and 435 nm might be due to the presence of oxygen vacancies [19].

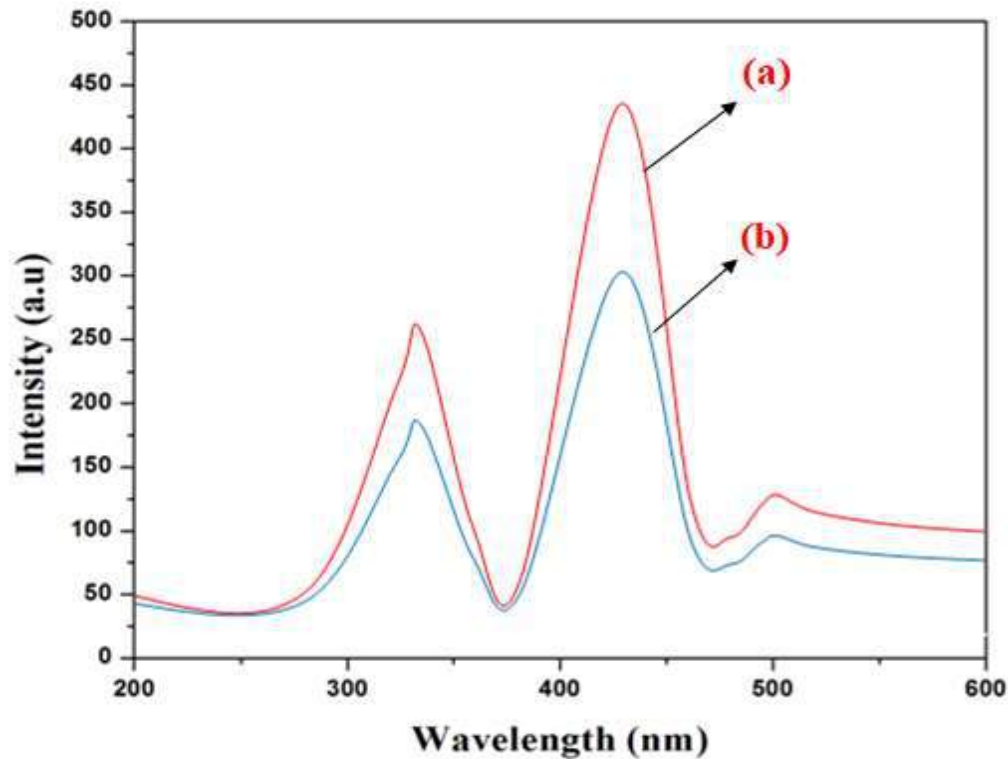


Figure. 3.4. PL analysis of (a) ZrO_2 and (b) CrO_4-ZrO_2 nanocomposite material

3.5. Diffuse Reflectance Spectroscopy

The UV-Vis DRS analysis is one of the spectra analysis show regions in a specific wavelength range which can be attributed to the photo-excitation of electrons from VB to CB. The UV-Vis can be approximately calculated from the optical reflectance data by the Kubelka–Munk function,

$$A = F(R) = \frac{((1-R)^2)}{2R} \quad \dots\dots (1.2)$$

where α is the absorbance coefficient, R is the diffuse reflectance (6). An extrapolation of the linear region of a plot of $(F(R) hv)^2$ vs hv gives the value of the optical bandgap energy. The bandgap energy for nanocomposite material is calculated from $E = hv = hc/\lambda$.

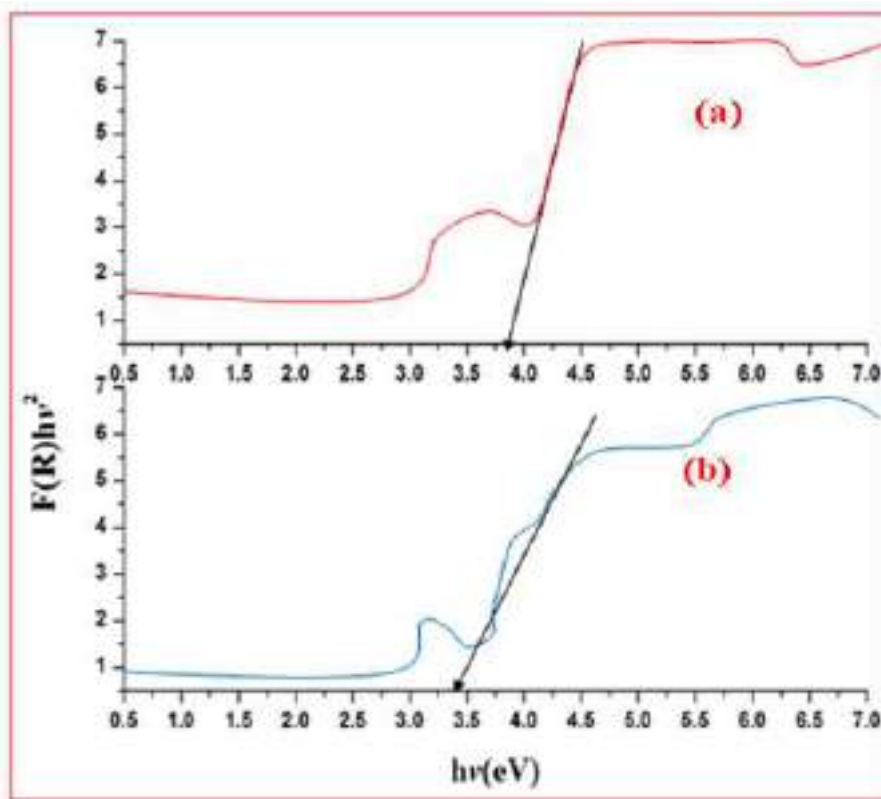


Figure 3.5. UV-Vis DRS analysis of (a) ZrO_2 and (b) CrO_4-ZrO_2 nanocomposite material

The bandgap energy of pure ZrO_2 and prepared CrO_4-ZrO_2 nanocomposite material is 3.19 and 3.0 eV correspondingly its shows in Figure 3.5 a and b. These results showing prepared CrO_4-ZrO_2 nanocomposite material has low bandgap low bandgap energy high photocatalyst and electrochemical applications were obtained [20].

3.6. Photocatalytic application under solar and UV-light

3.6.1. Primary Analysis; Photodegradation Study of TB Dye

Figures 3.6.1 A and B show the photo degradability of Trypan Blue (TB) with various photocatalysts under UV and solar light. In the absence of UV and solar light, the

percentage of dye degradation with CrO_4-ZrO_2 is very low (curve-a). This could be due to dye adsorption on the catalyst's surface. The curve-b depicts the degradation of dye in the absence of a photocatalyst under UV and solar light. Self-photolysis is not a problem for dye. These findings suggest that both UV and solar light are required for the effective degradation of Trypan Blue (TB) dye. Under UV and solar light, the percentages of dye degradation with ZrO_2 are 36% and 39%, respectively (curve-c). Under UV and solar light, the percentage of dye degradation with prepared CrO_4-ZrO_2 is 65% and 68%, respectively (curve-d). This demonstrates that prepared CrO_4-ZrO_2 degrades Trypan Blue (TB) more efficiently under solar light.

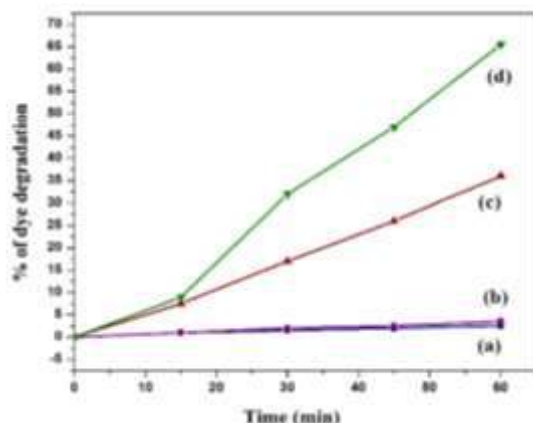


Figure 3.6.1. (A) . Photodegradation study of TB dye under UV-light - irradiation at 365 nm by (a) Dark (b) Nil catalysis (c) ZrO₂ (d) CrO₄- ZrO₂ nanocomposite material

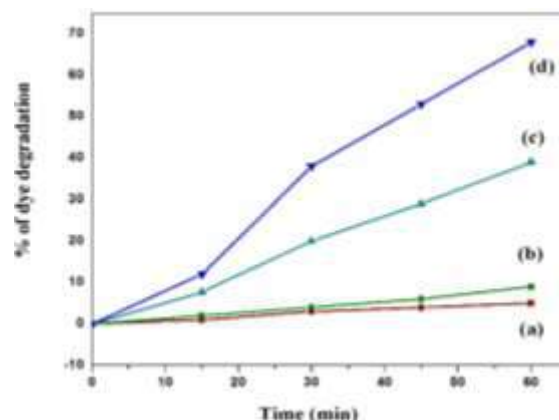


Figure 3.6.1. (B) . Photodegradation study of TB dye under Solar light irradiation at 365 nm by (a) Dark (b) Nil catalysis (c) ZrO₂ (d) CrO₄- ZrO₂ nanocomposite material

➤ TB dye 1×10^{-4} , nanocomposite material suspended= 2 gL^{-1} , airflow rate 8.1 mL s^{-1} , IUUV = $1.381 \times 10^{-6} \text{ Einstein L}^{-1} \text{ S}^{-1}$

➤ TB dye 1×10^{-4} , nanocomposite material suspended= 2 gL^{-1} , airflow rate 8.1 mL s^{-1} , Isolar= $1250 \times 100 \pm 100 \text{ Lux}$.

3.6.2. Effect of pH on photodegradation of dye

The pH of the solution has a significant impact on photocatalytic activity. The surface properties of the ZrO₂ and prepared CrO₄-ZrO₂ catalyst are significantly affected by the pH of the reaction medium. The pH of the solution has a significant impact on photocatalytic activity. The surface properties of the ZrO₂ and prepared CrO₄-ZrO₂ catalyst are significantly affected by the pH of the reaction medium. **Figures 3.6.2 A and B** depict the effect of pH on trypan blue photocatalytic degradation. The figure clearly shows that the photocatalytic process is highly dependent on the pH of the dye solution [21].

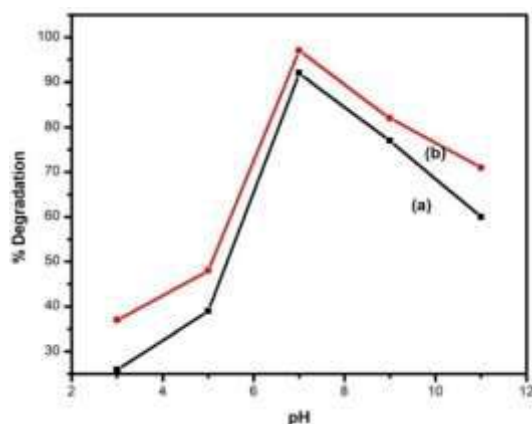


Figure 3.6.2. (A) pH study under UV-light (a) ZrO₂ and (b) CrO₄- ZrO₂ nanocomposite material.

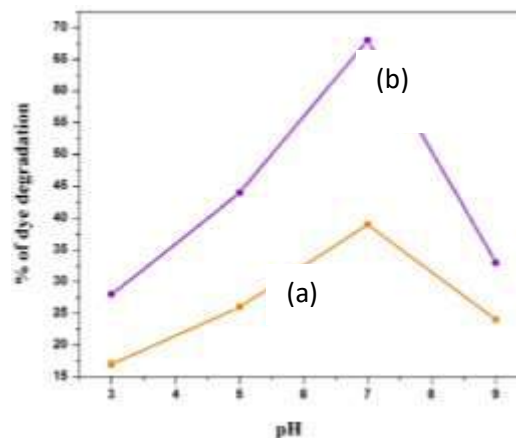


Figure 3.6.2. (B) pH study under Solar light (a) ZrO₂ and (b) CrO₄- ZrO₂ nanocomposite material.

➤ TB dye 1×10^{-4} , nanocomposite material suspended= 2 gL^{-1} , airflow rate 8.1 mL s^{-1} , IUUV = $1.381 \times 10^{-6} \text{ Einstein L}^{-1} \text{ S}^{-1}$

➤ TB dye 1×10^{-4} , nanocomposite material suspended= 2 gL^{-1} , airflow rate 8.1 mL s^{-1} , Isolar= $1250 \times 100 \pm 100 \text{ Lux}$.

The pH changes the surface properties of the nanocomposite material, causing the dye molecules to dissociate. At pH 7, per hydroxyl radicals (HO_2^\cdot) are formed, which results in the

formation of hydrogen peroxide, which produces several hydroxyl radicals (HO^\cdot) [22]. At pH 7, the highest photocatalytic degradation of ZrO₂ and prepared CrO₄ ZrO₂ is observed. It has



been discovered that degradation is strongly influenced by the pH of the solution. The percentage of degradation is observed to increase up to pH 7 and then decrease. Under UV and solar light, pH 7 has superior photocatalytic activities.

3.6.3. Effect of Temperature on photodegradation of dye

Temperature effects on catalytic reaction of $\text{CrO}_4\text{-ZrO}_2$ nanocomposite material were studied from 150 °C to 450 °C. As the reaction temperature was raised, the equilibrium of TB removal was reached in less time, as shown in **Figures 3.6.3 A and B**. The highest percentage degradation was observed at

450 °C, where 65% and 68% of TB were removed after only 60 minutes under UV and solar light, respectively. The lowest percentage degradation was observed at 300 °C, where 28% and 31% of TB were removed after only 60 minutes under UV and solar light, respectively. The lowest percentage degradation was observed at 150 °C, where 21% and 23% of TB were removed after only 60 minutes under UV and solar light, respectively. At high temperatures, hydrogen peroxide easily self-decomposes, and the decomposition rate of hydrogen peroxide increases with every 150 °C. Superior temperatures tend to reduce the number of defects on the photocatalyst's surface area.

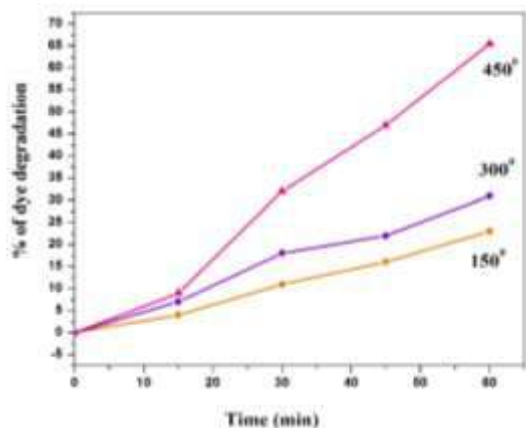


Figure 3.6.3. (A) The effects of Temperature under UV-light $\text{CrO}_4\text{-ZrO}_2$ nanocomposite material (a, b)

➤ TB dye 1×10^{-4} , nanocomposite material suspended = 2 gL^{-1} , airflow rate 8.1 mL s^{-1} , $I_{UV} = 1.381 \times 10^{-6} \text{ Einstein L}^{-1} \text{ S}^{-1}$

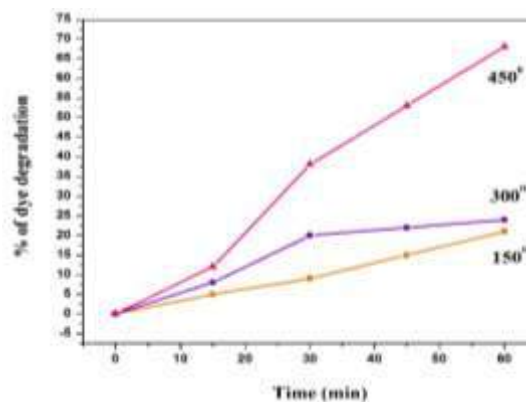


Figure 3.6.3. (B) The effects of Temperature under Solar light $\text{CrO}_4\text{-ZrO}_2$ nanocomposite material (a, b)

➤ TB dye 1×10^{-4} , nanocomposite material suspended = 2 gL^{-1} , airflow rate 8.1 mLs^{-1} , $I_{solar} = 1250 \times 100 \pm 100 \text{ Lux}$.

Effect of Catalyst Loading on photodegradation of dye

The effect of catalyst loading investigated from 0.05, 0.08 and 0.10g of ZrO_2 and prepared $\text{CrO}_4\text{-ZrO}_2$ nanocomposite material photodegradation of TB dye ($1 \times 10^{-4} \text{ M}$) solution used UV and solar- Light degradation at 365 nm on 60 min and time interval 15 min obtained. The utmost degradation of TB dye under UV and solar light exhibit 0.05g on ZrO_2 at (16 % & 24 %), 0.08 g (36 % & 39 %), 0.1 g (24 % & 49 %) and prepared $\text{CrO}_4\text{-ZrO}_2$ degradation of TB dye exhibit 0.05 g (16 % & 19 %), 0.08 g (65 % & 68 %), 0.1g (10 % & 46 %). **Figures 3.6.4 A and B** show the effect of catalyst load on the photocatalytic degradation of the dye.

The catalytic (ZrO_2 and $\text{CrO}_4\text{-ZrO}_2$) load was varied from 0.05 to 0.1 g/ 50 mL to determine the optimal catalyst dosage. The ideal load was determined to be 0.08 g/50 mL. A screening effect may occur if the catalyst loading is increased beyond the optimal dosage. This effect reduces the catalyst's specific activity. Particle aggregation may reduce catalytic activity at higher catalyst dosages. Above the optimal load, slurry turbidity increases, light penetration decreases, and the availability of hydroxides and superoxides decreases; thus, photocatalytic activity decreases. As a result, the optimum catalyst dosage under UV and solar light was 0.08 g/50 mL for the efficient removal of Trypan Blue (TB) dye [23,24].

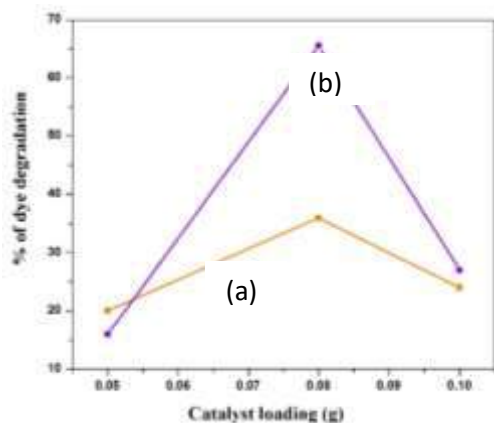


Figure 3.6.4. (A). The effects of catalyst loading (a) ZrO₂ and (b) CrO₄- ZrO₂ nanocomposite material under UV-light.

➤ TB dye 1×10^{-4} , nanocomposite material suspended = 2 gL^{-1} , airflow rate 8.1 mL s^{-1} , IUUV = $1.381 \times 10^{-6} \text{ Einstein L}^{-1} \text{ S}^{-1}$

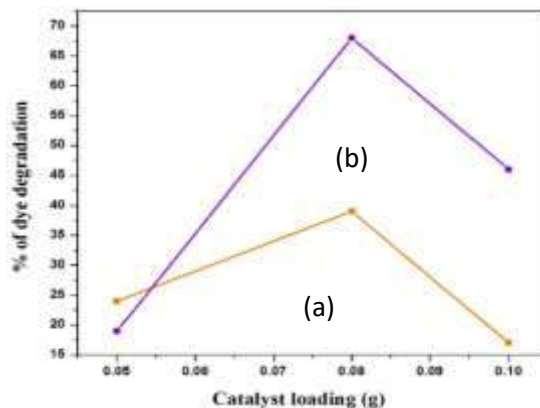


Figure 3.6.4 (B). The effects of catalyst loading (a) ZrO₂ and (b) CrO₄- ZrO₂ nanocomposite material under Solar light

➤ TB dye 1×10^{-4} , nanocomposite material suspended = 2 gL^{-1} , airflow rate 8.1 mL s^{-1} , Isolar = $1250 \times 100 \pm 100 \text{ Lux}$.

3.6.4. Effect of Dye Concentration on photodegradation of dye

The impact of different initial dye concentrations on photocatalytic degradation has been studied. **Figures 3.6.5 A and B** depict the effect of dye concentration on the photocatalytic activity of ZrO₂ and a CrO₄-ZrO₂ nanocomposite material. Trypan blue was tested at concentrations ranging from $1 \times 10^{-4} \text{ M}$ to $3 \times 10^{-4} \text{ M}$. The catalytic load was kept constant at 0.08 g and the pH was kept at 7. Under UV and solar light, the optimal dye concentration of ZrO₂ and prepared CrO₄-ZrO₂ nanocomposite material was observed to be $1 \times 10^{-4} \text{ M}$. The time required for complete dye degradation increases as the dye concentration increases. When the dye concentration is low, many active sites in

the photocatalyst are vacant, and the slurry remains almost clear, allowing light to pass through.

Photodegradation is aided by light penetration. The dye molecules occupy the active sites as the dye concentration increases, and this trend continues until all of the sites are filled, which occurs at a specified optimum concentration. Beyond this concentration, the slurry becomes turbid, preventing light penetration and thus slowing degradation. A significant amount of UV and solar-light may be absorbed by the dye molecules rather than the catalyst at high concentrations, reducing catalytic efficiency [25]. Under UV and solar light, the optimum dye concentration of ZrO₂ and prepared CrO₄-ZrO₂ nanocomposite material was observed to be $1 \times 10^{-4} \text{ M}$.

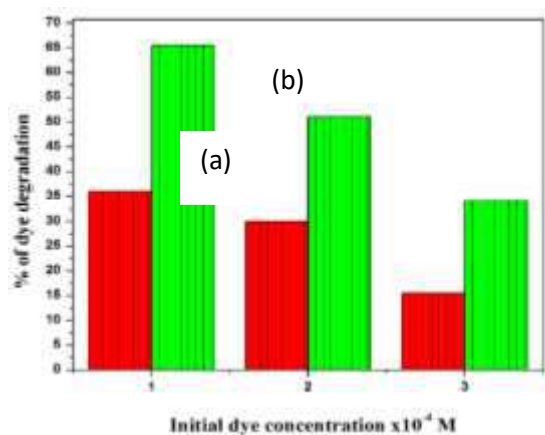


Figure 3.6.5. (A) The effects of concentrations of (a) ZrO₂ and (b) CrO₄- ZrO₂ nanocomposite material under UV-light.

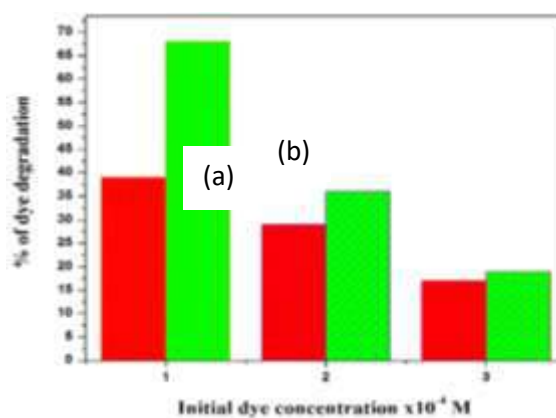


Figure 3.6.5 (B) The effects of concentrations of (a) ZrO₂ and (b) CrO₄- ZrO₂ nanocomposite material under Solar light



➤ TB dye 1×10^{-4} , nanocomposite material suspended = 2 gL^{-1} , airflow rate 8.1 mL s^{-1} , IUUV = $1.381 \times 10^{-6} \text{ Einstein L}^{-1} \text{ S}^{-1}$

➤ TB dye 1×10^{-4} , nanocomposite material suspended = 2 gL^{-1} , airflow rate 8.1 mL s^{-1} , Isolar = $1250 \times 100 \pm 100 \text{ Lux}$.

3.6.5. Stability and Reusability of Photocatalyst

On TB dye, the stability and reusability of ZrO_2 and prepared $\text{CrO}_4\text{-ZrO}_2$ nanocomposite material. TB dye degradation experiments were also repeated four times on the nanocomposite material. The nanocomposite material was thoroughly washed in water after each cycle, and a fresh solution of TB dye was made before each photocatalyst run in the photoreactor. **Figures 3.6.6 A and B** show the results of UV and solar-light irradiation. The complete degradation of TB dye in ZrO_2 and prepared $\text{CrO}_4\text{-ZrO}_2$

nanocomposite material under UV and solar light are 74 % & 88 %, 58 % & 80 %, 58 % & 80 %, 58 % & 80 % and 94 % & 95 %, 73 % & 81.5 %, 73 % & 81.5 %, 73 % & 81.5 % respectively. **(Table 1.1)**. The results indicate prepared catalysts are stable and reusable of nanocomposite material. This suggests that prepared $\text{CrO}_4\text{-ZrO}_2$ photocatalyst have stability and reusability for the photodegradation of pollutants **(Table-1.1)**. The final result indicates Solar-Light irradiation highly photocatalytic activity than that of UV - Light irradiation

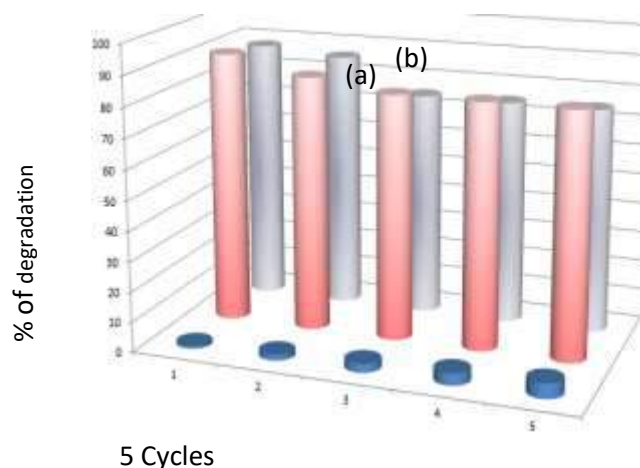
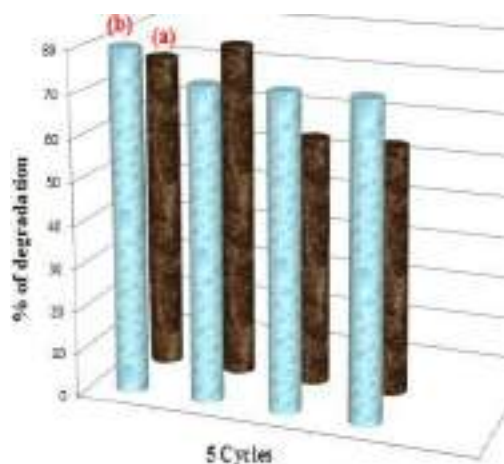


Figure 3.6.6. (A) Stability and Reusability on TB dye degradation; (a) ZrO_2 and (b) $\text{CrO}_4\text{-ZrO}_2$ nanocomposite material under UV-light.

Figure 3.6.6. (B) Stability and Reusability on TB dye degradation; (a) ZrO_2 and (b) $\text{CrO}_4\text{-ZrO}_2$ nanocomposite material under Solar light.

➤ TB dye 1×10^{-4} , nanocomposite material suspended = 2 gL^{-1} , airflow rate 8.1 mL s^{-1} , IUUV = $1.381 \times 10^{-6} \text{ Einstein L}^{-1} \text{ S}^{-1}$

➤ TB dye 1×10^{-4} , nanocomposite material suspended = 2 gL^{-1} , airflow rate 8.1 mL s^{-1} , Isolar = $1250 \times 100 \pm 100 \text{ Lux}$.

Table 1.1 Nano Catalyst Reusability under UV & Solar light

No of cycles	Percentage of TB removal on ZrO_2		Percentage of TB removal on $\text{CrO}_4\text{-ZrO}_2$	
	UV	Solar	UV	Solar
1	74	88	94	90.5
2	58	80	73	81.5
3	58	80	73	81.5
4	58	80	73	81.5

4. MINERALIZATION STUDY

4.1. Chemical Oxygen Demand Analysis (COD)

The chemical oxygen demand (COD) analysis is an important indicator of organic pollution in water. The COD measurement for the degradation of Trypan Blue (TB) dye on prepared $\text{CrO}_4\text{-ZrO}_2$ nanocomposite material loading amount of 0.08 gram on dye initial concentration $1 \times 10^{-4} \text{ M}$ suspension for 40 mL of PH 7 solution and air passing with UV 365 nm was performed. The

chemical oxygen demand test is a popular method for determining the organic strength of wastewater. The waste can be measured in terms of the total amount of oxygen required for the oxidation of organic matter to CO_2 and water. The dye solution's COD before and after treatment was calculated. The reduction in COD values of the treated dye solution indicates dye molecule mineralization as well as color removal. COD values of blank and treated dye solutions are shown in **Table 1.2**.



Table 1.2. Percentage of chemical oxygen demand analysis of Trypan Blue (TB)

Sl. No.	Time (Min)	COD Values		% of degradation of Trypan Blue with CrO ₄ -TiO ₂
		Initial COD (mg/50mL)	Final COD (mg/50mL)	
1	60	4.5	1.4	68

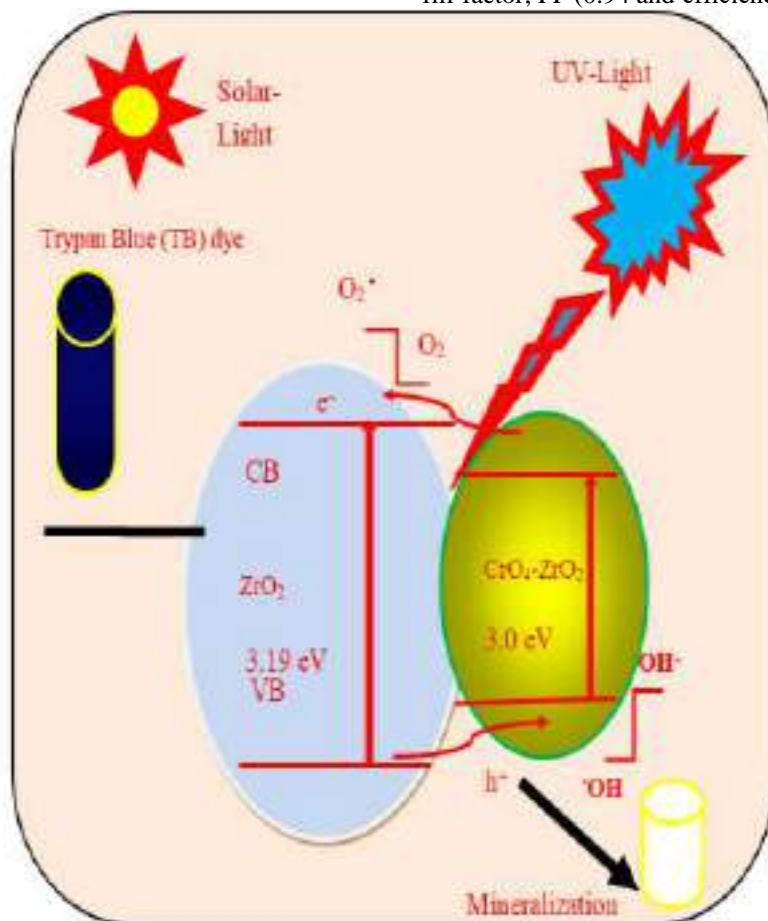
4.2. Mechanism of Degradation

From the photocatalytic mechanism results, a process based on photocarrier transfer is discovered. With 365 nm light, ZrO₂ is excited upon irradiation. The transfer of the photoexcited electron from the surface of CrO₄-ZrO₂ nanoflower occurs in the case of CrO₄ altered ZrO₂ due to greater positive conduction band potential. The charge carriers are thus effectively separated. Electrons stored on the nanocomposite material conduction band are absorbed by adsorbed O₂ molecules. The result is superoxide radicals (O₂^{•-}) being formed. TB dye molecules are decomposed by these superoxide radicals and hydroxide radicals formed by holes [26-29]. It is shown in **Scheme 1.1**.

5. ELECTRO CATALYTIC APPLICATION

5.1. Dye sensitized solar cells Analysis

The **Figures.5.1 a and b** show that the fabrication activity of photo current-voltage (I-V) in the sensitized solar cells (DSSCs) dye as photoelectrode, as photoelectrodes are coated on the fluorine-doped tin oxide (FTO-plate) glass substrate, ZrO₂ and prepared CrO₄-ZrO₂ nanocomposite material act as photoelectrode. The routine solar cell is fabricated with ZrO₂ and prepared CrO₄-ZrO₂ nanocomposite material with Ruthenium dye (535-bisTBA, N719). From the data, it is clear that (N719) the prepared CrO₄-ZrO₂ nanocomposite material-based cell gives the brilliant activity with the use of dye as sensitizer reunite the maximum value of short-circuit current density, J_{sc} (3.2 mA/cm²) than ZrO₂ (3.0 mA/cm²), open-circuit voltage, V_{oc} (500 mV), fill-factor, FF (0.94 and efficiency, η (1.7 %).





Scheme. 1.1. Schematic representation for the photodegradation holes and electrons in the nanocomposite material under Solar and UV- light for successive mineralization of TB dye.

The outcome indicates successful electron transfer of prepared CrO₄-ZrO₂ nanocomposite material and keeps back the recombination of the photogenerated charge carrier, thus increasing the short circuit current and electron transfer [30].

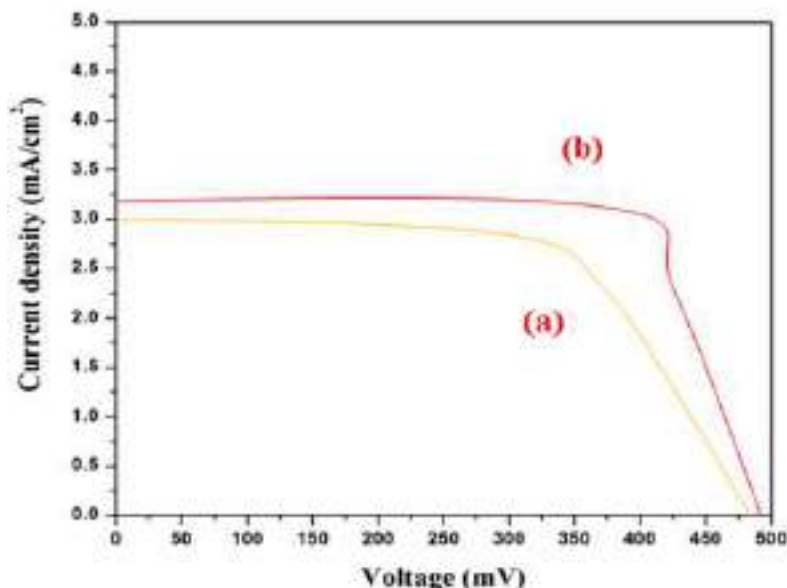


Figure 5.1. Current density–voltage (I–V) curves for the DSSC's fabricated from (a) ZrO₂ and (b) CrO₄- ZrO₂ nanocomposite material

6. CONCLUSION

The prepared CrO₄-ZrO₂ nanocomposite material was synthesized using a co-precipitation method and was characterized by HR-SEM and HR-TM analysis for spherical morphology structure, with X-ray (EDX) analysis confirming the presence of Cr, Zr, and O in the nanocomposite material. The crystalline size of both ZrO₂ and prepared CrO₄- ZrO₂ was determined using the Debye-Scherrer equation. XRD analysis revealed that the average crystalline size of ZrO₂ and prepared CrO₄- ZrO₂ is 27 nm and 19 nm, respectively. The decrease in PL (CrO₄-ZrO₂) intensity results in high photocatalytic activity comparable to ZnO₂. The UV-Vis DRS spectrum had a low bandgap energy, allowing it to function as an efficient photocatalyst and to be used in DSSCS applications. The photocatalytic application of TB dye under Solar-Light irradiation is more photocatalytic than that under UV-Light irradiation. The prepared nanomaterial was found to be stable and reusable after an achievable mechanism was proposed and the nanomaterial was discussed extensively. According to the electrochemical analysis results, the prepared CrO₄-ZrO₂ nanocomposite material is effective in electron transfer and inhibits photogenerated charge carrier recombination, which improves electron transfer and increases short circuit current.

Credit authorship contribution statement

K. Subashri: Writing - original draft, Writing - review & editing, Conceptualization, Data curation, Methodology.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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EMBRACING BUDDHIST ETHICS: A PATH TO HARMONIOUS LIVING IN DAILY LIFE

Tiloka,¹ Dr. Yeshpal²

¹PhD Research Scholar Department of Buddhist Studies, Swami Vivekanand Subharti University, Meerut, Uttar Pradesh-250002

²Assistant Professor, Department of Languages, Swami Vivekanand Subharti University, Meerut, Uttar Pradesh-250002

ABSTRACT

Buddhist ethics serve as a guiding light for individuals seeking to lead a life of moral integrity and inner peace. Rooted in the teachings of the Buddha, these principles offer practical guidance for navigating the complexities of daily life with compassion, mindfulness, and wisdom. This article delves into the foundational aspects of Buddhist ethics, explores their application in various spheres of daily life, and highlights their transformative potential in fostering personal well-being and social harmony.

KEYWORDS: Buddhist Ethics, Four Noble Truths, Dukkha, Sukha, Emotion

INTRODUCTION

In a world filled with myriad challenges and distractions, the quest for inner peace and moral clarity has never been more relevant. Buddhist ethics, deeply rooted in the teachings of the Buddha, provide a profound framework for individuals seeking to lead a life of purpose and integrity. At the heart of Buddhist ethics lie principles such as non-harming (ahimsa), compassion (karuna), and mindfulness (sati), which serve as guiding beacons illuminating the path towards virtuous living. In this article, we embark on a journey to explore the integration of Buddhist ethics into the tapestry of daily life. We delve into the foundational teachings of Buddhism, examining how they inform our understanding of morality and ethical conduct. Furthermore, we unravel the practical applications of Buddhist ethics in various spheres of daily life, from interpersonal relationships to societal engagement. By embracing these timeless principles, individuals can cultivate inner harmony, navigate moral dilemmas with clarity, and contribute to the creation of a more compassionate world.

1. Foundational Teachings of Buddhist Ethics

The foundational teachings of Buddhist ethics are rooted in the core principles elucidated by Siddhartha Gautama, the historical Buddha. These teachings, which form the ethical bedrock of Buddhism, are designed to guide practitioners towards the alleviation of suffering and the realization of liberation. Here are the key foundational teachings of Buddhist ethics:

1. The Four Noble Truths: This fundamental doctrine encapsulates the essence of the Buddha's enlightenment. It comprises:

- The truth of suffering (*Dukkha*): Existence is inherently unsatisfactory and characterized by various forms of suffering, including physical, emotional, and existential.

- The truth of the cause of suffering (*Samudaya*): The root cause of suffering is craving (*tanha*) and attachment, which arise from ignorance (*avijja*) of the true nature of reality.

- The truth of the cessation of suffering (*Nirodha*): Suffering can be overcome by eliminating craving and attachment, leading to the cessation of suffering and the attainment of Nirvana.

- The truth of the path leading to the cessation of suffering (*Magga*): The Noble Eightfold Path provides a systematic framework for overcoming suffering and attaining liberation.

2. The Noble Eightfold Path: This path outlines the ethical and spiritual practices necessary for the cessation of suffering and the realization of Nirvana. It consists of eight interconnected factors:

- Right View: Understanding the Four Noble Truths and the nature of reality.

- Right Intention: Cultivating wholesome intentions of renunciation, goodwill, and harmlessness.

- Right Speech: Refraining from lying, harsh speech, divisive speech, and idle chatter.

- Right Action: Abstaining from killing, stealing, and sexual misconduct.

- Right Livelihood: Engaging in livelihoods that are honest, ethical, and conducive to spiritual growth.

- Right Effort: Cultivating wholesome qualities and overcoming unwholesome ones.

- Right Mindfulness: Developing mindfulness of body, feelings, mind, and phenomena.

- Right Concentration: Cultivating deep states of concentration and mental absorption through meditation.

3. The Five Precepts: These are ethical guidelines that lay Buddhists undertake to abstain from actions that cause harm and suffering. The Five Precepts are:

Refraining from killing or harming living beings. Refraining from stealing or taking what is not given. Refraining from engaging in sexual misconduct. Refraining from false speech or



lying. Refraining from consuming intoxicants that cloud the mind.

4. **Compassion and Loving-Kindness (Metta):** Central to Buddhist ethics is the cultivation of compassion and loving-kindness towards all beings. Practitioners are encouraged to develop empathy, kindness, and goodwill, fostering harmony and reducing suffering in the world.

5. **The Principle of Non-Harming (Ahimsa):** Rooted in the concept of karma, the principle of non-harming emphasizes abstaining from actions that cause harm or suffering to oneself or others. Practicing non-violence in thought, speech, and action is essential for ethical conduct.

6. **Generosity (Dana):** Generosity is considered a virtuous practice in Buddhism, reflecting the understanding of interconnectedness and the alleviation of suffering through selfless giving.

These foundational teachings of Buddhist ethics serve as guiding principles for moral conduct and spiritual development, aiming to lead practitioners towards liberation from suffering and the realization of ultimate peace and happiness.

2. Principles of Buddhist Ethics in Daily Life

Incorporating the principles of Buddhist ethics into daily life is not only about theoretical understanding but also about practical application. Here are ways to apply these principles in your everyday actions:

1. **Mindfulness in Action:** Practice mindfulness in all your activities. Whether you're eating, walking, working, or interacting with others, strive to be fully present and aware of your thoughts, feelings, and actions. This cultivates a deeper understanding of yourself and your impact on the world around you.

2. **Kindness and Compassion:** Make kindness and compassion your guiding principles in all interactions. Treat others with empathy, understanding, and goodwill. Offer help and support to those in need, and refrain from causing harm or suffering to any living being.

3. **Right Speech:** Be mindful of your speech and communication. Practice honesty, kindness, and integrity in your words. Refrain from gossiping, lying, or speaking harshly. Instead, use your words to uplift and inspire others.

4. **Non-Harming (Ahimsa):** Live by the principle of non-harming in all aspects of your life. Avoid causing harm to yourself, others, and the environment. This includes being mindful of your actions, consumption habits, and the impact they have on the world around you.

5. **Generosity and Giving:** Cultivate generosity in your daily life by giving freely of your time, resources, and talents. Practice acts of kindness and generosity towards others without expecting anything in return. This fosters a sense of interconnectedness and promotes harmony within your community.

6. **Ethical Conduct:** Uphold ethical principles in your actions and decisions. Follow the Five Precepts, refraining from actions that cause harm or suffering to yourself or others. Choose livelihoods and activities that align with your values and contribute positively to the world.

7. **Self-Reflection and Growth:** Take time for self-reflection and introspection. Regularly examine your thoughts, emotions, and

behaviors to identify areas for growth and improvement. Cultivate self-awareness and strive to overcome negative habits and tendencies.

8. **Engagement in Spiritual Practices:** Dedicate time to spiritual practices such as meditation, prayer, or mindfulness exercises. These practices help cultivate inner peace, clarity, and wisdom, enabling you to navigate life's challenges with equanimity and compassion.

9. **Respect for All Beings:** Treat all living beings with respect and dignity. Recognize the inherent worth and interconnectedness of all life forms and strive to live in harmony with the natural world.

10. **Cultivation of Virtuous Qualities:** Cultivate virtuous qualities such as patience, humility, gratitude, and forgiveness. These qualities enhance your well-being and contribute to a more compassionate and harmonious world. By integrating these principles into your daily life, you can cultivate greater mindfulness, compassion, and wisdom, leading to a life of greater fulfillment, purpose, and happiness.

3. Application of Buddhist Ethics in Daily Life

Mindfulness in Action: Central to Buddhist ethics is the practice of mindfulness, which involves being fully present and aware in each moment. In daily life, mindfulness can be cultivated through practices such as meditation, mindful breathing, or simply paying attention to one's thoughts and actions. By being mindful in our activities, we develop greater clarity, insight, and self-awareness, enabling us to make more conscious choices and respond skillfully to life's challenges.

Kindness and Compassion: Buddhist ethics emphasize the cultivation of kindness and compassion towards all beings. In daily life, this means treating others with empathy, understanding, and respect. We can practice kindness by offering a helping hand to those in need, listening attentively to others, and refraining from judgment or criticism. Compassion extends not only to humans but also to animals and the environment, fostering a sense of interconnectedness and care for all living beings.

Right Speech: The principle of right speech encourages us to communicate with honesty, kindness, and mindfulness. In our daily interactions, we can practice right speech by speaking truthfully, refraining from gossip or harmful speech, and using words that uplift and inspire others. By cultivating mindful communication, we foster harmony, trust, and understanding in our relationships, creating a positive environment for personal and collective growth.

Non-Harming (Ahimsa): Ahimsa, or non-harming, is a core principle of Buddhist ethics that emphasizes the avoidance of causing harm to oneself, others, and the environment. In daily life, we can practice ahimsa by adopting a vegetarian or plant-based diet, reducing our consumption of resources, and avoiding activities that contribute to violence or exploitation. By living in alignment with the principle of ahimsa, we promote peace, compassion, and sustainability in the world.



Generosity and Giving: Generosity is considered a virtue in Buddhism, reflecting the practice of selflessness and compassion. In daily life, we can cultivate generosity by giving freely of our time, resources, and skills to help others. This could involve volunteering for charitable causes, donating to those in need, or simply offering a kind word or gesture to someone who is struggling. By practicing generosity, we cultivate a spirit of abundance and contribute to the welfare and happiness of others.

Ethical Conduct: Ethical conduct is a cornerstone of Buddhist ethics, encompassing principles such as the Five Precepts, which guide practitioners in leading a virtuous life. In daily life, we can uphold ethical principles by following the precepts of refraining from harming, stealing, engaging in sexual misconduct, lying, or consuming intoxicants. By aligning our actions with ethical guidelines, we cultivate integrity, trustworthiness, and moral responsibility, creating a foundation for personal and collective well-being.

Self-Reflection and Growth: Self-reflection is essential for personal growth and development, allowing us to examine our thoughts, emotions, and behaviors with honesty and clarity. In daily life, we can cultivate self-reflection through practices such as journaling, meditation, or contemplative inquiry. By reflecting on our experiences, we gain insight into our habits and patterns, allowing us to cultivate positive qualities and overcome unwholesome tendencies.

Engagement in Spiritual Practices: Spiritual practices such as meditation, prayer, or chanting are integral to Buddhist ethics, offering pathways to inner peace, wisdom, and liberation. In daily life, we can dedicate time to spiritual practices that resonate with us, nurturing our spiritual growth and connection to the sacred. By engaging in spiritual practices, we cultivate a deeper understanding of ourselves and the world, fostering resilience, and inner strength in the face of life's challenges.

Respect for All Beings: Buddhist ethics teach respect and reverence for all living beings, recognizing the inherent worth and dignity of each sentient being. In daily life, we can practice respect by treating others with kindness, empathy, and consideration, regardless of their background or beliefs. We can also extend respect to animals and the environment by adopting sustainable practices and advocating for the well-being of all living beings. By cultivating respect, we create a culture of inclusivity, compassion, and mutual support in our communities.

CONCLUSION

Incorporating Buddhist ethics into daily life offers a transformative path towards personal fulfillment and societal well-being. By embodying principles such as compassion, mindfulness, and ethical conduct, individuals can navigate the complexities of modern existence with clarity, integrity, and resilience. As we strive to cultivate inner peace and contribute to a more compassionate world, the timeless wisdom of Buddhist

ethics serves as a beacon of hope, guiding us towards a harmonious and sustainable future.

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A STUDY OF SALES PROMOTION SCHEMES AND CONSUMER BUYING BEHAVIOUR OF SELECTED ORGANIZED FOOD RETAIL STORES IN BHOPAL CITY

Vijay Singh Thakur

Professor Maharana Pratap College of Management Bhopal

ABSTRACT

The present study is based on the examination of relationship between promotional schemes of organized food retail stores and consumer buying behaviour with respect to offers advertisement, incentives and personal selling. The purpose of exploring this relationship is to identify the most important promotional scheme which has a strong positive association with consumer buying behaviour that can be helps the organized retail stores to prepare and design better strategies to attract more and more consumers. The data for the present study were collected with the help of structure questionnaire method and total 131 consumers have been targeted. The findings of the study have been clearly reveals that promotional schemes with respect to offers, advertisement and personal selling are significantly and positively related with consumer buying behaviour. However incentive is not found significantly related with consumer buying behaviour of organized food retail stores.

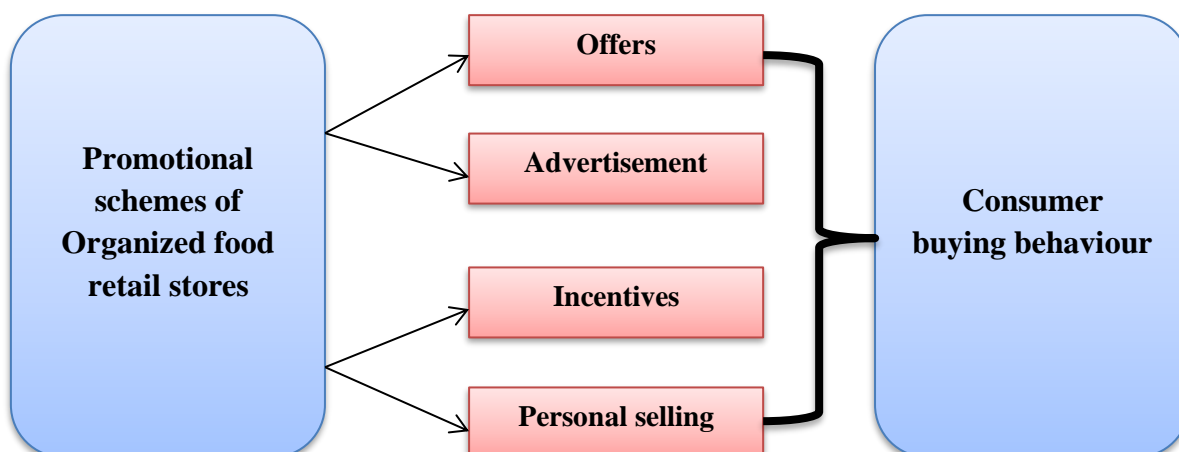
KEYWORDS: Promotional scheme, offers, advertisement, incentives, personal selling, consumer buying behaviour.

INTRODUCTION

In the present scenario of business the study of consumer behaviour is one of the most important areas for study. However it is important for both consumer as well as organization. Most of the research study has been explore that consumer is king of the market because he decides supremacy of the market; in other word actual market leader is elected by the consumer. There are number of factors that directly impact the buying behaviour of consumer. Among these factors promotional scheme is one of the most important factors significantly and positively related with consumer behaviour. Organized food retail stores are the separate branch of retail business that operate under one roof and can be able to fulfil all the basic needs of the peoples without spending more time. These retail stores include super market, reliance fresh, Aapoorti, Ondoor and kabuliwala. These retail stores can be

adopt such as departmental store and mini shopping mall to attain customer preference and needs. Now days the organized food retail store has become the choice of consumer because of many features. However the advantage of the organized food retail stores is the ability to offer various promotional schemes to the consumer. The present research study is based on relationship between promotional scheme and consumer buying behaviour of selected organized food retail store in Bhopal city. In order to explore the relationship between promotional scheme and consumer buying behaviour researcher adopt some of the promotional scheme such as offers, advertisement, incentives, and personal selling. The study was based on consumer response whose use to buy the product and services without involving any other intermediates. The research study covered three organized food retail store such as reliance fresh, Aapoorti and Ondoor.

Theoretical Framework





PROMOTIONAL SCHEMES

Promotional schemes are the combination of all those schemes which is offered by the stores to the ultimate consumer, the purpose of promotional schemes is to attract more and more new consumers and retaining existing customers. The various promotional schemes directly and indirectly offered by the retail store are as

1. **Offers:** offers is one of the most important promotional schemes provide to increase sales for the particular products and services. The offers include buy one get one, free products with purchase product etc.
2. **Advertisement:** advertisement is most powerful method for reaching to the peoples. However advertisement is the formal communication in which a product, brand and services are promoted to attract more and more customers. On the other hand advertisement is a systematic process to communicate information about product and services in order to increase sales.
3. **Incentive:** Incentive in sales is the promotional offer that aims to influence customers in order to increase sales for a particular product and services. However incentive may be in the form of discount, coupon, cart promotions, free shipping offers etc.
4. **Personal selling:** Personal selling is most usable promotional tools and technique that involve direct and face to face interaction with target as well as potential customer. Personal selling also builds relationship with customer in order to improve customer satisfaction.

CONSUMER BUYING BEHAVIOUR

Consumer buying behaviour is the process and action individual undertake on the time of making Purchase decision. On the other hand the behaviour and attitude use by the individual on the time of purchasing is called buying behaviour.

REVIEW OF LITERATURE

Sharma, A. & Kashyap, K., (2023), has been conducted a research study and indicates that majority of consumers use to prefer the purchasing of foods and groceries from the organized retail store, however majority of customers is highly interested to purchase the product from malls furthermore the study also reveals that most of the time the demographic factors such as, age, qualification and size of the family is highly and significantly influence the criteria for selection of store. In the conclusive remark authors also mentioned that the consumer have a separate desire to purchase the product and service at the minimum efforts.

Chatzoglou, P. et al. (2022) has been conducted a research study in order to explore the repurchase intention of customer regarding the particular product and services. The study explore that merchandise value is the most important factor form the customer point of view. Furthermore study reveals that emotion and satisfaction of the customer is highly influence repurchase intention of the customer. However in the conclusive remark it has been mentioned by the study that experienced value, consumer behaviour, emotion of the consumer, customer

satisfaction and loyalty is highly attract the customer for again and again purchase from particular and same retails.

Savale, T. K et al.,(2021), has been conducted a research study and found that grocery store have experienced and shifted in the retail outlet and also offer a high comprehensive shopping experience as well as reducing the cost. Furthermore the study indicates that recently most of the retailers have been re-defined retailing and offering a wide variety of product offer discount, coupons, long term membership card etc. In the conclusive remark study also reveals that retail industry is now in the stage of positive growth and also benefited to retails as well as customers.

Venkateswarn, P. S & Sundram, S. (2021), has been conducted a research study to explore the impact of retail service quality on customer satisfaction, repurchase intention and word of mouth. The study was based on primary data which has been gathered from the customers of retail stores. The findings of the study indicate that service quality of the retail store is significantly and positively related with customer satisfaction of word of mouth. Furthermore study also reveals the impact of various service aspects point out that reliability, policy and personal interaction is highly influence the level of customer satisfaction.

Pandy, P & Singh, S. (2020), has been conducted a research study to explore the consumer attitude about organized retail stores. The findings of the study clearly reveals that consumer attitudes towards the organized retail store is influenced by store credibility, customer loyalty and service excellence. Furthermore study also explore that various features of retail store like ambience and atmosphere, loyalty program of customer and branded items are highly attract the customers.

Singh, S. (2020), has been conducted a research study to explore the impact of demographic factor on choice of customers regarding organize retail stores. The findings of the study reveals that among all the demographic factors gender and income are the most significant factor influencing customer choice regarding retail stores. Furthermore study explore that promotional schemes, trust and experience staff are the most important factors affecting the customer choice regarding purchasing from organized retail store.

Sirohi, R. & Kumar, N. (2018), has been conducted a research study to examine the service quality of retail store by including six service quality dimensions of various selected retail stores. The study was based on primary data which has been collected among the group of customers use to purchase the product from the retail store. The findings of the study explore that various factors such as, reliability, appearance, problem solving, policy and courteousness having significant relationship and found most influential factors affecting customers future consumer behaviour.

OBJECTIVES OF THE STUDY

The objectives of the study are as under:

1. To study the relationship between promotional schemes and consumer buying behaviour towards offers.



2. To study the relationship between promotional schemes and consumer buying behaviour towards advertisement.
3. To study the relationship between promotional schemes and consumer buying behaviour towards incentives.
4. To study the relationship between promotional schemes and consumer buying behaviour towards personal selling.

HYPOTHESIS OF THE STUDY

The various hypothesis of the study are as under

H_{a1}: There is a significant relationship between promotional schemes and consumer buying behaviour with respect to offers.

H_{a2}: There is a significant relationship between promotional schemes and consumer buying behaviour with respect to advertisement

H_{a3}: There is a significant relationship between promotional schemes and consumer buying behaviour with respect to incentives.

H_{a4}: There is a significant relationship between promotional schemes and consumer buying behaviour with respect to personal selling.

RESEARCH METHODOLOGY

Major amount of research study has been conducted to explore the relationship between promotional schemes and consumer buying behaviour towards organized food retail stores. The present research study is based on consumer behaviour towards promotional schemes offered by selected retail store in Bhopal city. The analytical method of research has been adopted to prepare a framework of the study with the help of primary as well as secondary data. Primary data has been collected with the help of structure questionnaire and secondary data has been

collected from various sources like publish research paper, thesis etc.

SAMPLE SIZE AND DESIGN

Sample for the present study has been collected from those consumers whose use to purchase product and services from organized food retail store in Bhopal city. In order to gather the sample different geographic locations of retail store has been identified. The convenient method of sampling was adopted to collect the sample among the group of consumers, however final questionnaire were distributed among the 150 consumers and 131 consumers were filled the questionnaire and participated in the survey. The final sample size of the study was 131.

Sample method: Convenient method of sampling was adopted to collect the sample among the group of consumers of various selected retail stores.

Sample Size: Sample size for the present study is 131.

Sample area: the sample area for present study is limited up-to organized food retails stores located in Bhopal only.

Statistical tools: Chai square test has been used for data analysis and explore the result of hypothesis.

DATA ANALYSIS & TESTING OF HYPOTHESIS

Hypothesis First

H_{a1}: There is a significant relationship between promotional schemes and consumer buying behaviour with respect to offers.

Table 1

Summary of relationship between promotional schemes and consumer buying behaviour with respect to offers

Chai Square Test			
	Chai Square	df	Significant
Chai Square	11.92	5	0.001
Likelihood Ratio	14.82	5	0.121
Total valid Responses	131	-	-

Findings: The above table explore the relationship between promotional schemes and consumer buying behaviour with respect to offers, since the value of chai square is **11.92** and P-value is 0.01 ($P \geq 0.05$). In this case the alternative hypothesis is accepted. However this result is an evidence, that promotional schemes with respect to offers have a significant

and positive relationship with consumer buying behaviour of organized food retail stores (**H_{a1}= Accepted**).

Hypothesis Second

H_{a2}: There is a significant relationship between promotional schemes and consumer buying behaviour with respect to advertisement

Table 2

Summary of relationship between promotional schemes and consumer buying behaviour with respect to advertisement

Chai Square test			
	Chai Square	df	Significant
Chai Square	17.22	5	0.011
Likelihood Ratio	26.126	5	0.001
Total valid Response	131	-	-

Findings: The above table deals with the relationship between promotional schemes and consumer buying behaviour with

respect to advertisement, since the value of chai square is **17.22** and P-value is 0.011 ($P \geq 0.05$). In this case the alternative



hypothesis is accepted. However the study explore that there is a significant relationship between promotional scheme with respect to advertisement and consumer buying behaviour of organized food retail stores (**H_{a2}= Accepted**).

Hypothesis Third

H_{a3} There is a significant relationship between promotional scheme and consumer buying behaviour with respect to incentive.

Table 3

Summary of relationship between promotional schemes and consumer buying behaviour with respect to incentive

Chai Square Test			
	Chai Square	df	Significant
Chai Square	21.159	5	0.051
Likelihood Ratio	22.116	5	0.042
Total valid Response	131	-	-

Findings: The relationship between promotional schemes and consumer buying behaviour of organized food retail stores with respect to incentives can be seen in the above table, since the value of chai square **21.159** and P-value is 0.051 ($P \leq 0.05$). In this case the alternate hypothesis is rejected. The result clearly explore that offers of the organized food retail store is not

significantly and positively related with consumer buying behaviour (**H_{a3}= Rejected**).

Hypothesis Four

H_{a4}: There is a significant relationship between promotional scheme and consumer buying behaviour with respect to personal selling.

Table 4

Summary of relationship between promotional schemes and consumer buying behaviour with respect to personal selling

Chai Square Test			
	Chai Square	df	Significant
Chai Square	16.112	5	0.001
Likelihood Ratio	14.293	5	0.010
Total No.of Valid Response	131	-	-

Findings: The above table describe the relationship between promotional schemes and consumer buying behaviour with respect to personal selling, since the value of chai square is **16.112** and P-value is 0.001 ($P \geq 0.05$). In the case the alternative hypothesis is accepted. However the result reveals that there is a significant and positive relationship between personal selling and consumer buying behaviour of organized food retail store (**H_{a4}= Accepted**).

most important factor to balance buying behaviour of the existing consumer as well as to attract new consumers. The study finally concludes that the higher majority of consumers appreciated and accepted the various promotional schemes which mean organize food retail store are offering the products and services as per consumer choice, therefore the behaviour of consumer is positively with respect to purchasing of product and services from the selected organized food retail stores in Bhopal city.

CONCLUSION

The purpose of the present study is to explore the relationship between promotional schemes and consumer buying behaviour of organized food retail stores in Bhopal city. The study discussed few important factors as the promotional schemes of organized food retail stores and their consumer buying behaviour. The findings of the study indicates that offers, advertisement and personal selling has been found most important promotional tools which has significant impact on the consumer buying behaviour, because in these case the study accepted alternative hypothesis at the level of significant (P-value). However incentive offered by the organized food retail stores have not been found significant tool of promotional schemes because it is not significantly and positively related with consumer buying behaviour. In this case the alternative hypothesis is rejected. On the basis of the various findings the study concludes that the consumer visit organized food retail stores because of effective promotional tools such as offers, advertisement and personal selling which is highly appreciated by them. The implication of the study may be that the selected organized food retail stores must be formulated a well structure and effective strategies with respect to incentives because it is

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EXPLORATION OF SOCIAL REALITY AND POSITION OF WOMEN IN VIJAY TENDULKAR'S KAMALA

Purna Chandra Haldar

Assistant Professor, Kalyani Mahavidyalaya

ABSTRACT

Drama, as an artistic expression, is not only a delightful source of entertainment but also a powerful vehicle for instruction and reformation. The Indian dramatists artfully delve into contemporary socio-cultural issues and delineate the reality in an artistic form. Vijay Tendulkar as an iconic dramatist with social vision raises his voice against injustices meted out to the poor and the victims of structured violence in a brilliant manner. Women characters are given a crucial role in his plays. His plays are concerned with social, cultural, gender, and man-woman relationships in traditional Indian society. He presents the male-centric Indian society where women are forced to live as mere parasites. The male chauvinism remains at root in most of his plays. He exposes those issues with artistic delineation and attacks the moral standards of the patriarchal middle class society of contemporary India. This paper aims to present the social realism and the position of women in the play Kamala.

KEY WORKS: Artistic, Injustice, Hypocrisy, Chauvinism, Patriarchal

I. INTRODUCTION

Vijay Tendulkar, a renowned Indian playwright appeared during post-independent India and steered the Indian theatre to a higher scale of success, The Marathi theatre over last few decades. He wrote a number of plays most of which are socially concerned. He illumined the Indian drama with his famous plays as Kamala, Silence: The Court is in Session, Sakharan Binder, The Vultures, Encounter in Umbugland, Ghashiram Kotwal, A Friend's Story, and Kanyadan. He was much more preoccupied with the contemporary Indian society. His plays are mainly concerned with contemporary social and political issues, man-woman relationships, position of women in Post-independent India, psychological crisis, judicial injustice, bourgeois rise, clash between modern and traditional values and etcetera. He voices against the vicious nature of human being and unveils their hypocrisy.

Gender oppression is central to feminism. The first national-level conference of autonomous women's groups took place in Bombay in 1980 Feminists give primacy to fighting the hierarchical and oppressive relationship between the sexes to achieve gender equality. Class, caste and communal oppressions are fitted into this paradigm. With this point of departure, their primary emphasis in practice shifts to gender-related issues like rape, dowry, dowry-killings and other forms of domestic violence, the unequal division of labour at home, the regulation of fertility and women's control over her body, the repression of women's sexuality etc.

Kamala, a topical play, published in 1981, throws light on the evils in the so-called modern cultured contemporary society and physical as well as mental exploitation of women within the

family and outside it (Tendulkar 3). The play Kamala is based on a real-life incident.

II. SOCIAL REALITY AND KAMALA

Realism is a literary theory that writers use to present the reality as it exists. According to M.H. Abrams and Geoffrey Galt Harpham, "...realism, on the other hand, said to represent life as it really is.(Abrams 333)" Therefore, realism is the artistic representation of real life and incidents without addition, deletion. It is the faithful record of life and social world as it really visible. The play, Kamala is a naturalistic play. Tendulkar has structured his play Kamala keeping in mind the real incident. Jaising, the protagonist is career oriented. He purchased a young teen girl, Kamala from the remote village, Luhardaga, Bihar, and sheltered her in his own bungalow along with his wife, Sarita and maid, Kamalabai. He prepares for press conference the following day to expose the girl not for claiming the girl's freedom but for his professional interest. Kamala, the slave girl feels relax and comfort after reaching there but could not imagine that she would be exposed to public not for her sake but for her master's interest. Amiable in nature, she adjusted herself with the mistress of the house, Sarita, who also feels friendly to her. She was given hospitality and benign behaviour from the mistress. During a long discussion with Sarita, she realizes the outer and the inner world of women. Both Sarita and Kamala feel their same existence as women, one living in luxury and other in destitute but Sarita feels her own status in her husband's custody, where she is under the code of do's and don'ts. Through the conversation between Kamala and Sarita, Tendulkar exposes the reality of their lives both indoor and outdoor.



The contrast between Kamala, the slave girl, and Sarita, an educated one, draws critical attention to the readers. Kamala lives in utter depravity due to her low birth and lack of education and she is converted into a saleable commodity in the flesh market. Sarita despite having high education lives a life of parasite. She as a housewife of a reputed journalist enjoys domestic comfort but never enjoys the freedom of life. She is compelled to do and respond to her husband's wants. Kamala's appearance unveils the mask of male hypocrisy. Sarita realizes the verisimilitude between Kamala and she herself.

Jaisingh, a well-known young journalist working as an Associate Editor in an English-Language Daily, makes a report in his Daily about political leader in Madhya Pradesh, who suspected his servant and locked him up illegally,

Kakasaheb: Didn't bother to give his name. Just made threats?

Sarita: That was Yesterday. I remember... He wrote about an M.P. from Madhya Pradesh, who suspected his servant of theft. And locked him up and gave him a thrashing- all quite illegal (Tendulkar 6).

This anonymous telephone call of threats, harassment and murder is not the unprecedented but becomes a daily phenomenon,

Sarita: Oh, that's nothing unusual. We get those from time to time. Sometimes the phone rings in the middle of the night. If I pick it up, I have to hear some terrible things. Often, my husband isn't at home. And I wouldn't know where to look for him. I've got used to it" (Tendulkar 7).

The social and political nexus causes atrocity, rape, rapine and murder. The society suffers and blood. It is Kakasaheb's observation,

Kakasaheb: Tell him. Go on, tell him! How will he find the time to reply to it? Even if he's here when you start telling him- by the time you finish he'll be in Biharsharif- or perched on Laldenga's roof- gathering eyewitness evidence! And what will he be observing? Murder, bloodshed, rape, atrocity, arson!"

Jaisingh is out of Delhi for few days as he undergoes on a mission. He goes to slave market at Lohardaga in Bihar to collect information about slave trade there for his news paper." He returns with a girl bought from the slave market with two hundred and fifty. Women are openly exposed to market for auction and are sexually abused as Jaising says,

Jaising: Yes, women. Can't believe it, can you? The men who want to handle the women to inspect them. Whether they are firm or flabby. Young or old. Healthy or diseased. How they feel in the breast, in their waist, in their thighs and" (14).

Tendulkar brings into notice the status of women as saleable commodity.

III. STATUS OF WOMEN IN KAMALA

Kamala and Sarita engage into short conversation and reveal their own existence. The enquiry of Kamala to Sarita stirs Sarita and makes her know her own status in society,

Kamala: How much did he buy you for?

(Sarita is confused at first)

Sarita: What?

Kamala: I said, how much did he buy you for?

Sarita (Recovering): Me? Look here, Kamala, (Changes her mind and sits down beside her), for seven hundred.

Kamala: My god! Seven hundred!(34).

Sarita gradually wakes out of her unconsciousness. She starts brooding over her own status in family. She finds no difference between Kamala and herself though the latter is highly educated. Both are purchased to maintain the household chores and fulfill the desires of male. Kamala sparks Sarita's consciousness. During the conversation with Kakasaheb, Sarita appears as with a different tone. She reveals that her existence in society is mere slave. Her likes and dislikes, emotions and passions, do's and don'ts are governed by her husband. She is taught to live as a woman 'limping behind man' and Kakasaheb encourages Sarita,

Kakasaheb: Sarita, the questions you are asking have only one answer. Because he's like that. That's why he's a man. And that's why there's manhood in the world. I too was just like this. Don't go by what I seem to be today. I gave your aunt a lot of trouble. As if it was my right."

Kakasaheb, the uncle of Sarita, stands for old generation with patriarchic attitudes in his pockets. Patriarchal dominance was considered as a right of man. Time changes but patriarchic mindset never undergoes any noticeable change in the society. Women are, according to Kakasaheb, taught to adjust with men with less degree of honour. With the change of time, masculine attitude towards woman has not been altered. The women are grasped and are converted as mere object of pleasure. The traumatic domestic life of women is well exposed through the Sarita. Again, the Kamala as a piece of commodity is passed over from one person to another. She sold to Jaisingh by the slave trader. She is again to be passed to the police or somewhere else of unknown destination. Therefore, Tendulkar artfully presents the pathetic existence of women in society where they are destined by men.

IV. MALE HYPOCRISY

The meeting between Sarita and Kamala is a turning point of the play. Jaisingh's hypocrisy is revealed as Sarita finds no difference between Kamala and herself. He keeps Sarita into stern constriction of domestic chores. She has no freedom of life. Her likes and dislikes, feelings and passions are never considered and are dictated by her husband. She has to respond according to her husband's desires,

Sarita: I am going to present a man who in the year 1982 still keeps as a slave, right here in Delhi. Jaisingh Jadhav. I'm going to say: this man's great advocate of freedom.



And he brings home a slave and exploits her. He doesn't consider a slave a human being- just a useful object. One you can use and throw away. He gets people to call him a sworn enemy of tyranny. But he tyrannizes his own slave as much as he likes, and doesn't think anything of it- nothing at all. Listen to the story of how he bought the slave Kamala and made use of her. The other slave he got free- not just free- the slave's father shelled out the money- a gig sum. As him what he did with it (an uncontrollable sob bursts from her. She controls it). Sorry.(Tendulkar 46)

Sarita gradually emerges out of her disgrace life of domestic slavery and dreams for an independent life, the life beyond the grip of male. She steps ahead with a series of questions and tries to emancipate herself. Through the portrayal Sarita and Kamala, Tendulkar presents the harsh reality of position of women in traditional Indian society. Sarita voices against the male dominance over the female life. Tendulkar fashions Sarita with self-consciousness.

Kakasaheb: It may be unpleasant, but it's true. If the world is to go on, marriage must go on. And it will only go on like this.

Sarita: Why? Why can't men limp behind? Why aren't women ever the masters? Why can't a woman at least ask to live her life the same way as a man? Why must only a man have the right to be a man? Does he have one extra sense? A woman can do everything a man can(Tendulkar 47).

Kamala was exposed to press conference on the following day. The news spread with a thunder speed. Jaising went to attend a party. In the meantime, Jain, rushed to Jaising's house with the information that the Editor of the Daily decided to terminate Jaising's as a journalist. Jaising hurried home and collapsed on hearing this incident. Jain reports that Jaising has been dismissed due to the exposure of the slave in the press conference that evening. He further reports that there was a flesh racket with big people,

Jain: There have been pressures on the proprietor. I learnt that some very big people are involved in this flesh racket. Kakasaheb: But a man who's doing such a wonderful job-proprietor's paper has become famous and respected because of it.

Jain: A big paper doesn't recognize respect and all that, Kakasaheb- it only knows about circulation and advertisements. And profit and loss.

Jaising has been sacked as he jeopardizes the wrong friendships. Jaising thinks of his own promotional interest by exposing the flesh trade racket. His supposed termination from his job unveils the mask of hypocrisy of the modern media system as Jaising uses abusive language in retaliation against his proprietor,

Jaising (Get up roaring): No! Shut up! Let me speak-Yu shut up. What does he imagine himself to be? What is he? A bloody capitalist. A swindler. A black marketer. A

bloody income tax evader. I'll hold a press conference tomorrow- I'll strip of cover off him! I'll expose all his dirty secrets! I'll tear him to pieces-the dirty pig!

Tendulkar exposes not only the domestic exploitation and discrimination between man and woman but also exposes prevalent pictures of hollowness, black marketer of the modern journalism and so called the masked bourgeois class. Journalism is a pillar of democracy whereas it is used as means of professional profit.

The inherent self-deception is exposed dramatically by Tendulkar. At the centre of the play, there is a self-seeking journalist, Jaisingh Jadhav, who treats the woman he has bought from the flesh market as an object that can buy for him a promotion in his job and a reputation in his professional life. He is one of those modern day individuals with a single track mind, who pursues their goal unquestioningly. Jaising never stops to think what will happen to Kamala after this exposure. Tendulkar takes a jibe at the modern concept of journalism which stresses the sensational. For this, he uses Kakasaheb, a journalist of the old school, who runs a small paper with his own resources.

V. CONCLUSION

Tendulkar attributes the characters with their own personality. The play focuses on the rural girl Kamala, the urban woman Sarita, bourgeois capitalist, the proprietor of the Daily and the aspiring journalist, Jaisingh, are not the mouth speakers of Tendulkar but they are the real, topical and are associated with their own cultural views and stands. Kakasaheb bears old generation style of media whereas Jaisingh the new. The male dominance over the female is encouraged by Kakasaheb and enacted by Jaisingh. Thus throughout the play, Tendulkar incorporates the characters of Jaisingh, Kakasaheb, Sarita, Kamala, proprietor of the Daily, and some other including political figures involved in nexus. Each character represents some social, cultural, and political reality.

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A STUDY ON RURAL WOMEN'S ECONOMIC EMPOWERMENT IN ODISHA'S JAJPUR DISTRICT

Sudeshna Mishra

Department of Sociology, Utkal University, Vanivihar

ABSTRACT

In recent years, women's empowerment has become a major concern. Women's economic empowerment is now considered a prerequisite for national development. Thus, the main goal of this essay is to examine the new developments in rural women's economic empowerment in the Jajpur region of Odisha through self-help groups (SHG) and entrepreneurship. The main data gathered via survey analysis forms the basis of this research. Thanks to SHGs, women in rural areas now have more access to resources and information, providing a broader platform for economic empowerment. Through the SHG movement, women may initiate economic activity. Members of Self-Help Groups (SHGs) were able to describe how their creative activities had expanded beyond just financial support to become their primary source of income. Through the SHG movement, there was social and economic advancement. In this sense, women and financial institutions are increasingly endorsing the SHG concept. SHGs are now a powerful tool for empowering women on a social and economic level, which eventually aids in the general development of rural women. According to this study, financial autonomy, household decision-making authority, freedom of travel, and a better capacity to organise social life are all positively impacted by economic empowerment.

KEYWORDS: *Economic Empowerment, Entrepreneurship, Self-Help Group, Rural Women*

INTRODUCTION

In order to bring about the revolutionary social, environmental, and economic transformations necessary for sustainable development, rural women play a critical role. Nonetheless, among the other difficulties they have are restricted access to financing, healthcare, and education. These issues are made worse by the world's food and economic crises as well as climate change. Given the prominence of women in the global agricultural workforce, empowering them is critical to the health of people, families, and rural communities as well as to overall economic production. When a society raises per capita income, lowers poverty, expands individual economic opportunities, improves education, improves health and nutrition, preserves natural resources, creates a cleaner environment, and fosters a more vibrant cultural life, then its members are said to have reached economic development. By helping the low-income women, the creation of new policies, programmes, and even projects encouraged changes in women's position. In the past, awareness of the needs of low-income women has often coincided with an understanding of their critical role in development. The most modern strategy is empowerment, which tries to give women more internal strength and self-reliance. The government of India started the creation of a self-group to offer enough attention to their economic independence through self-employment, entrepreneurial growth, and well-being, which eventually leads to their contribution, through its policy of empowering women. In terms of both social and economic perspective, the SHGs empower women. The SHG members

engage in activities that provide them with income, and this has a significant positive impact on the lives of rural women. Having one's own business is one way to empower women. Improving the economic productivity of women is a crucial tactic for raising the standard of life for Indian homes who fall below the poverty line. It is well recognised that one of the biggest obstacles to economic progress is the presence of weak women in the political, social, and economic spheres. Initiatives that impact people's financial well-being by utilising financial instruments like loans are categorised as income-generating activities. With the aid of the financing facilities offered by the various financial institutions, the Self-Help Group offers rural women a suitable platform for starting and maintaining income-generating enterprises.

SHGs have been an increasingly effective tool for empowering women in the rural economy and reducing poverty. Through the network of commercial banks, co-ops, regional rural banks, NABARD, and non-governmental organisations, SHGs have been able to further improve their social standing and provide financial services to the impoverished. This method has been mostly driven by supply. SHGs are crucial in this regard for lowering rural poverty, encouraging savings in the area, and boosting meaningful employment. It is a homegrown model for reducing poverty that also strives to better empower and mould the lives of its members. In order to allow members with comparable interests to engage freely in the self-help group, groups are supposed to be homogeneous. India's rural loan



distribution system has undergone a quiet revolution thanks to the self-help groups (SHGs) movement. SHGs have shown to be a successful channel for providing rural impoverished people with loans for socioeconomic empowerment. It is a tool to end poverty and enhance women's financial support and entrepreneurship in India. A self-help group is a small, economically homogenous affinity group of rural impoverished people who voluntarily band together to save a modest sum of money on a monthly basis. This money is then placed into a common fund to cover members' emergency needs and facilitate group-decided, collateral-free loans. Self-help groups improve women's standing as equals in the democratic, economic, social, and cultural domains as participants, decision-makers, and beneficiaries. The creation of Self-Help Groups, women's entrepreneurship, and the economic empowerment of rural women in Odisha's Jajpur district are the key topics of this article.

As was previously said the deliberate process of empowering women to recognise their own identity and potential in all areas of life is known as empowerment. Economic independence serves as the foundation and source of support for the empowerment process, which consists of several interrelated elements. Organising individuals is key to empowerment, especially when it comes to credit and developing financial management skills. The goal is to empower the impoverished to mobilise their own resources through mutual aid, strengthen their financial management skills, and enable them to use external financing. The idea of self-help groups has been discussed in rural areas to assist people live better. It lessens poverty by giving the impoverished household access to chances for skilled wage work and profitable self-employment. As a result, SHGs have been paving the way for women's empowerment and the reduction of poverty that exists in Indian households. Women who are empowered can fully express who they are and participate fully in all aspects of life. The development of women's agency and strategic decision-making in the economic domain, as well as the opportunities this creates for change in other areas of their life, are central to the concept of women's economic empowerment. Considering these circumstances, the current study focused on the sample respondents' perceptions of their economic improvement upon joining a SHG in terms of the factors or characteristics that the researchers had defined as exhibiting the symptoms of economic empowerment.

REVIEW OF LITERATURE

1. In her essay "Economic Empowerment of Women through Self-Help Groups," Manimekalai (2004)

disclosed that the SHGs relied on non-governmental organisations (NGOs) to generate revenue. It is noted that rural women's confidence and self-image have increased after SHGs were formed. According to the survey, bank employees should advise and assist the women in choosing and carrying out lucrative revenue-generating ventures.

2. Shiralashetti, A.S. (2010) discovered that monthly income, a rise in monthly costs, improved savings, an increase in the ability to make decisions for the family, and so forth are all factors in women's empowerment through self-help groups in the Bijapur district. This demonstrates that the SHG movement is moving in the correct way to end poverty among the populace.
3. Does Microfinance Empower Women? is research by Ranjula Bali Swain and Fan Yang Wallentin. Evidence from Self-help Groups in India (2007) found that women are significantly empowered when they challenge prevailing societal conventions and cultural practices in order to better their own well-being. This empowerment also extends to SHG members.
4. In the 2013 research "A Case study on Self-help Groups in North Tamil Nadu," Dr. Percy Bose examined how SHGs helped women gain economic empowerment and discovered that members' incomes rose as a result of joining the groups.

OBJECTIVES

1. To assess the impact of the SHG in enhancing the economic empower of rural women.
2. To eradicate the poverty.

METHODOLOGY

The Jajpur district of Odisha's SHGS is included in the research. Primary sources and conversations with Jajpur SHG members provided the data that was used in the study. Three SHGS are used in a single hamlet where the study is conducted. There are forty-five rural women who are members of the SHGS overall. In 2015, these SHGS were initiated. Members are responders between the ages of thirty and forty-five. It is revealed that most of the women in SHG are quite young. For the study, only respondents who are housewives are selected.

Tool Used for Analysis

It was examined how the socioeconomic factors affected the participants' financial gains. The analysis's findings are displayed in the table below.

TABLE 1
Social status of respondents

	No. of Respondent	Percentage
SC	13	28.88%
OBC	25	55.55%
GENERAL	7	15.55%
Total	45	100%



The distribution of sample respondents by social status is displayed in this table. It is found that 15.55% of respondents are

from the general caste, 28.88% are from scheduled caste, and 55.55% are from backward caste.

TABLE 2
Reasoning for joining

	No. of Respondent	Percentage
For getting loan	20	44.44%
For family support	15	33.33%
For saving	10	22.22%
Total	45	100%

The distribution of sample responses by reason for attending a self-help group is shown in Table 2. It is noted that 44.44% of

respondents joined SHGs in order to obtain loans, followed by 33.33% for family assistance and 11.11% for future savings.

TABLE 3
Benefits after joining

	No. of Respondents	Percentage
Facility of getting loan	25	55.51%
Increased self confidence	10	44.44%
Saving	10	11.11%
Total	45	100%

According to this table, 55.51% of respondents said they could easily obtain a loan, 44.44% said joining a SHG had increased their confidence, and 11.11% said they had a little amount of funds.

advancement in social and economic standing has been a contribution. By enhancing women's income, spending, and saving behaviours, they also empower women.

FINDINGS

Researchers deduced from this study that rural women join SHGs for a variety of reasons, such as the ease with which they may obtain loans at just 2% interest for their children's education, family members' medical needs, and daughter marriage. It is an effective strategy for enhancing savings efforts and reducing poverty. SHGs contribute to the empowerment of women in this way.

CONCLUSION

The current study provided evidence for the larger influence of the socioeconomic factors on SHG membership. As a result of the substantial changes seen in the economic activities associated with women's everyday lives, the process of women's empowerment is conceptualised in terms of these variables. They are able to overcome financial obstacles in all facets of their lives and will have money to spend on their children's education as well as the acquisition of home goods. SHGs have discovered strategies for empowering women and lowering poverty. Their

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EVALUATION OF THE EFFECTIVENESS OF TURMERIC (CURCUMA LONGA LINN) METHANOL EXTRACT AS A PAIN RELIEVER AND FEVER REDUCER IN MALE WISTAR RATS

Chen Jiafei¹, Florenly²

¹Master of Clinical Medicine, Department of Clinical Medicine, Faculty of Medicine, Dentistry, Health Sciences, Universitas Prima Indonesia

²Department of Clinical Medicine, Faculty of Medicine, Dentistry, Health Sciences, Universitas Prima Indonesia

ABSTRACT

This study explores the potential of Turmeric (*Curcuma longa* Linn) as an antipyretic analgesic with flavonoid content in its methanol extract that can inhibit prostaglandins and reduce pain and fever. Although its use is still limited in Indonesia, this study aims to understand the analgesic and antipyretic effects of Turmeric methanol extract on male Wistar rats. The experimental design used the Post-Test Only Control Group to evaluate the antipyretic and analgesic effects at Prima Indonesia University Laboratory in January 2024. An acetic acid writhing test assessed an analgesic activity using a 0.7% acetic acid solution. The results showed the potential of Turmeric extract as an antipyretic and analgesic in male Wistar rats, especially at the highest dose (600 mg/kg body weight) after 5 hours of administration. The effect was more significant than the control and Standards groups, with hematological analysis showing increased extract dose. These findings support turmeric as a candidate for developing more effective antipyretic and analgesic drugs.

KEYWORDS: Turmeric (*Curcuma longa* Linn), Analgesic and antipyretic, Methanol extracts, Acetic acid writhing test, Analgesic and antipyretic effects

INTRODUCTION

Analgesics-antipyretics is a compound or drug used by humans of various ages to reduce pain and fever caused by multiple factors or conditions (Hung et al., 2018). This compound can relieve or eliminate painful sensations and reduce high body temperature due to fever. Therefore, analgesics-antipyretics are a common choice in treating symptoms such as headaches, muscle or joint pain, fever, and other conditions related to discomfort due to pain or elevated body temperature (Puspitaningrum et al., 2014). As such, analgesics-antipyretics are essential in human health care and well-being as they can help effectively manage bothersome symptoms (Puspitaningrum et al., 2014). Analgetics are compounds that can reduce or eliminate pain without removing consciousness.

Meanwhile, antipyretics can reduce fever (high body temperature) (Ponggele, 2013). A plant that can potentially act as an antipyretic analgesic compound is turmeric. Since ancient times, plants have been used in medicine and are still used today. In the beginning, trial and error methods were used to treat illnesses or even to feel better. The use of these plants has been gradually refined over generations, and these methods have become known in many contexts as traditional medicine (Cobra, 2019).

So many studies have been conducted to explore the various benefits of natural ingredients, one of which is Turmeric (*Curcuma longa* Linn). The methanol extract of Turmeric (*Curcuma longa* Linn) contains saponins, alkaloids, flavonoids, triterpenoids, tannins, and polyphenols (Helmalia, 2019).

Therefore, turmeric (*Curcuma longa* Linn) has various pharmacological effects, such as anti-inflammatory, antioxidant, antidiabetic, and antibacterial. Flavonoids in Turmeric (*Curcuma longa* Linn) can inhibit prostaglandins and have an antipyretic effect (Silalahi, 2018). The utilization of Turmeric (*Curcuma longa* Linn) for medicine in Indonesia is still not much, especially as an antipyretic analgesic. Thus, this study was designed to determine turmeric methanol extract's analgesic and antipyretic effects (*Curcuma longa* Linn) on male Wistar rats.

RESEARCH METHODS

This research is experimental research with Post-Test Only Control Group Design, which aims to explore the antipyretic and analgesic effects of Turmeric (*Curcuma longa* Linn). This research was conducted at Prima Indonesia University Laboratory in January 2024. The acetic acid writhing test method evaluated the analgesic activity of Turmeric (*Curcuma longa* Linn) extract. This method requires a 0.7% acetic acid solution, made using 0.7 ml of 100% glacial acetic acid dissolved in 100 ml of distilled water using a 100 ml volumetric flask. The preparation of this solution is done by first entering 20 ml of aquadest, then followed by 0.7 ml of 100% glacial acetic acid solution into a 100 ml volumetric flask, after which aquadest is added to the limit mark in a 100 ml volumetric flask.

Evaluation of the analgesic activity of this study was carried out using 25 rats grouped into five different groups:

- Control: Rats in this group were given 1 ml of 0.5% Na-CMC and, after 15 minutes, were injected 10 ml/kgBB of



- 0.7% acetic acid solution. After 5 minutes of injection, the number of writhing was counted in rats for 20 minutes.
- Standards (15 mg/kg body weight): Rats in this group were given an oral suspension of paracetamol 10 ml / kgBB. After 15 minutes, 10 ml / kgBB of 0.7% acetic acid solution was injected. After 5 minutes of injection, the number of writhing was counted in rats for 20 minutes.
 - Turmeric Extract (*Curcuma longa* Linn)-1 (200 mg/kg body weight): Rats in this group were given an oral suspension of Turmeric (*Curcuma longa* Linn) at a dose of 0.5 ml/kgBB and, after 15 minutes, were injected with 10 ml/kgBB of 0.7% acetic acid solution. After 5 minutes of injection, the number of writhing was counted in rats for 20 minutes.
 - Turmeric Extract (*Curcuma longa* Linn)-2 (400 mg/kg body weight): Rats in this group were given an oral suspension of Turmeric (*Curcuma longa* Linn) at a dose of 1 ml / kgBB and, after 15 minutes, were given an injection of 10 ml / kgBB of 0.7% acetic acid solution. After 5 minutes of injection, the number of writhing was counted in rats for 20 minutes.
 - Turmeric Extract (*Curcuma longa* Linn)-3 (600 mg kg body weight): Rats in this group were given an oral suspension of Turmeric (*Curcuma longa* Linn) at a dose of 1.5 ml/kgBB and, after 15 minutes, were injected with 10 ml/kgBB of 0.7% acetic acid solution. After 5 minutes of injection, the number of writhing was counted in rats for 20 minutes.
- Standards (600 mg kg body weight): Test animals were given an oral suspension of paracetamol 10 ml/ kgBB after 24 hours of induction. Food and drink were provided ad libitum.
 - Turmeric Extract (*Curcuma longa* Linn)-1 (200 mg/kg body weight): Test animals were given Turmeric extract (*Curcuma longa* Linn) at a dose of 0.5 ml / kgBB after 24 hours of induction. Food and drink were provided ad libitum.
 - Turmeric extract (*Curcuma longa* Linn)-2 (400 mg/kg body weight): Test animals were given Turmeric extract (*Curcuma longa* Linn) at a dose of 1 ml / kgBB after 24 hours of induction. Food and drink were provided ad libitum.
 - Turmeric extract (*Curcuma longa* Linn)-3 (600 mg kg body weight): Test animals were given Turmeric extract (*Curcuma longa* Linn) 1.5 ml / kgBB after 24 hours of induction. Food and drink were provided ad libitum.

The parameter measured to assess the analgesic activity of the sample is the number of writhes after 5 minutes of injection of 0.7% acetic acid solution for 20 minutes. In addition, the average inhibition of abdominal writhing can also be calculated by dividing the difference between the average number of writhes in the control group and the tested sample group by the average number of writhes in the control group multiplied by 100% (Saini & Singha, 2012).

Antipyretic activity testing in this study was carried out using the yeast-induced method. Brewer's Yeast solution was made from a 15% brewer yeast suspension form. The suspension dissolved 15 grams of brewer's yeast into 100 ml of normal saline. Then, 20 grams of the suspension was dissolved with 100 ml of distilled water to make a 20% brewer's yeast solution. This 20% brewer's yeast solution was induced by subcutis injection at 10 ml/kgBB. Before and 24 hours after induction, the rats' body temperature was measured rectally with a digital thermometer (Saini & Singha, 2012; Sivamurugan et al., 2016; Veronica et al., 2017).

Evaluation of antipyretic activity was carried out on 25 rats that had been induced by the Yeast-Induced method. The rats were then grouped into five groups, namely:

- Control: Test animals were given 1 ml of 0.5% Na CMC suspension after 24 hours of induction. Food and drink were provided ad libitum.

After being given turmeric methanol extract (*Curcuma longa* Linn), paracetamol was used as a standard, and Na-CMC was used as a control. Then, body temperature was measured every 1 hour for 5 hours after treatment. Then, the rats were dissected to take blood samples intracardiac using a three cc syringe with a 23 G needle. The blood samples obtained were then inserted into EDTA tubes. Before taking blood, the rats were anesthetized using chloroform. The EDTA blood samples were examined at the Health Laboratory, North Sumatra Provincial Health Office, for routine hematological examination (Maya and Chiuman, 2019; Chiuman, 2019).

The parameter in this study was the body temperature of rats measured by rectal body temperature measurement. The average percentage of decrease in body temperature of rats can be measured by sharing the difference between the average body temperature of rats 24 hours after induction and the average body temperature at a specific time after administration of the tested sample to the average body temperature of rats 24 hours after induction and multiplied by 100% (Saini and Singhal, 2012).

Data analysis in this study was carried out with IBM SPSS 25 software: phytochemical screening results, body weight of rats, number of writhing, and body temperature were analyzed by descriptive statistical analysis. Then, the analysis was continued with inferential statistical analysis according to the results of the data normality test using Shapiro-Wilk. If the data were normally distributed, parametric statistical analysis in the form of one-way ANOVA was performed, while if the data were not normally distributed, data transformation was performed. However, if the data is still abnormally distributed, an alternative test with non-parametric statistical analysis in Kruskal-Wallis is carried out.



RESEARCH RESULTS

Table 1. Data Normality Analysis with Shapiro-Wilk on Body Temperature Parameters

Parameters	Treatment Group	P-Value	Data Distribution
Body Temperature Before Induction	Control	0.146	Normal
	Standards	0.205	Normal
	Methanol Extract of Turmeric (Curcuma longa Linn) -I	0.420	Normal
	Methanol Extract of Turmeric (Curcuma longa Linn) -II	0.825	Normal
Body Temperature After Induction	Methanol Extract of Turmeric (Curcuma longa Linn) -III	0.150	Normal
	Control	0.925	Normal
	Standards	0.168	Normal
	Methanol Extract of Turmeric (Curcuma longa Linn) -I	0.242	Normal
Body Temperature 1 Hour after Treatment	Methanol Extract of Turmeric (Curcuma longa Linn) -II	0.017	Abnormal
	Methanol Extract of Turmeric (Curcuma longa Linn) -III	0.012	Abnormal
	Control	0.496	Normal
	Standards	0.482	Normal
Body Temperature 2 Hours After Treatment	Methanol Extract of Turmeric (Curcuma longa Linn) -I	0.021	Abnormal
	Methanol Extract of Turmeric (Curcuma longa Linn) -II	0.112	Normal
	Methanol Extract of Turmeric (Curcuma longa Linn) -III	0.582	Normal
	Control	0.481	Normal
Body Temperature 3 Hours After Treatment	Standards	0.495	Normal
	Methanol Extract of Turmeric (Curcuma longa Linn) -I	0.191	Normal
	Methanol Extract of Turmeric (Curcuma longa Linn) -II	0.561	Normal
	Methanol Extract of Turmeric (Curcuma longa Linn) -III	0.251	Normal
Body Temperature 4 Hours After Treatment	Control	0.681	Normal
	Standards	0.658	Normal
	Methanol Extract of Turmeric (Curcuma longa Linn) -I	0.616	Normal
	Methanol Extract of Turmeric (Curcuma longa Linn) -II	0.182	Normal
Body Temperature 5 Hours After Treatment	Methanol Extract of Turmeric (Curcuma longa Linn) -III	0.847	Normal
	Control	0.492	Normal
	Standards	0.057	Abnormal
	Methanol Extract of Turmeric (Curcuma longa Linn) -I	0.941	Normal
Body Temperature 5 Hours After Treatment	Methanol Extract of Turmeric (Curcuma longa Linn) -II	0.252	Normal
	Methanol Extract of Turmeric (Curcuma longa Linn) -III	0.688	Normal
	Control	0.185	Normal
	Standards	0.281	Normal
Body Temperature 5 Hours After Treatment	Methanol Extract of Turmeric (Curcuma longa Linn) -I	0.487	Normal
	Methanol Extract of Turmeric (Curcuma longa Linn) -II	0.562	Normal
	Methanol Extract of Turmeric (Curcuma longa Linn) -III	0.829	Normal

The table above illustrates the results of statistical tests on body temperature before and after induction and body temperature several times after treatment with different treatment groups. All groups showed a normal data distribution in terms of body

temperature before induction. However, after induction, it was seen that some groups, such as Methanol Extract of Turmeric (Curcuma longa Linn) II and III, showed abnormal data distribution. When looking at body temperature several hours



after treatment, most groups showed normal data distribution, except for Methanol Extract of Turmeric (*Curcuma longa* Linn) I at 1 hour after treatment. In some groups, there were

significant differences in body temperature, indicated by p values less than the significance level of $p < 0.05$.

Table 2 Comparison of Body Temperature in All Treatment Groups

Treatment Group	Suhu Tubuh (°C)						
	Treatment Group	After induction**	1 Hours**	2 Hours*	4 Hours*	4 Hours*	5 Hours*
Control	45.34 ± 0.48	48.36 (0.40)	48.85 (1.40)	48.81 ± 0.11	48.12 ± 0.41	48.41 ± 0.14	48.01 ± 0.41 ^a
Standards	45.23 ± 0.28	48.21 (0.50)	48.50 (1.40)	48.41 ± 0.49	48.20 ± 0.21	48.02 ± 0.41	41.82 ± 0.22 ^{ab}
Methanol Extract of Turmeric (<i>Curcuma longa</i> Linn) -I	45.12 ± 0.41	48.41 (0.50)	48.40 (0.90)	48.14 ± 0.42	48.44 ± 0.48	48.24 ± 0.40	41.90 ± 0.42 ^a
Methanol Extract of Turmeric (<i>Curcuma longa</i> Linn) -II	45.44 ± 0.27	48.80 (0.40)	48.50 (0.80)	48.48 ± 0.11	48.00 ± 0.28	41.84 ± 0.24	41.10 ± 0.24 ^{ab}
Methanol Extract of Turmeric (<i>Curcuma longa</i> Linn) -III	45.20 ± 0.17	48.23 (1.20)	48.10 (1.20)	48.18 ± 0.41	48.41 ± 0.41	41.81 ± 0.41	41.01 ± 0.14 ^b
P-value	0.881	0.527	0.284	0.912	0.102	0.152	0.014

Table 2 compares body temperature in all treatment groups over different periods. Body temperature was measured before, after, and at intervals of 1, 2, 4, and 5 hours after treatment. The treatment groups included a control, a standard group, and three groups that received Methanol Extract of Turmeric (*Curcuma longa* Linn) at various doses. Before induction, the average body temperature in the control group was 45.34°C, while the standard and treatment groups with turmeric methanol extract had values of 45.23°C and 45.12°C, respectively. After induction, body temperature increased in all groups, with the Control group reaching 48.36°C, the standard group reaching 48.21°C, and the treatment group with turmeric methanol extract varying from 48.41°C to 48.80°C. Further analysis was

carried out at certain time intervals. At 1 hour after treatment, all groups' body temperature increased significantly. However, there was no significant difference between the control, standard, and treatment groups. Furthermore, there were variations in body temperature between groups at intervals of 2, 4, and 5 Hours after treatment. The statistical analysis results showed no significant difference at 2 and 4 hours, but at 5 hours, there was a substantial difference between the groups. Thus, the results from this table show the comparison of body temperature between treatment groups over time, giving an idea of the potential body temperature effects of administering turmeric methanol extract in male Wistar rats.

Table 3 Data Normality Analysis with Shapiro-Wilk on the Parameter Number of Writhing

Parameters	Treatment Group	P-value	Data Distribution
Number of Wriggles	Control	0.854	Normal
	Standards	0.824	Normal
	Methanol Extract of Turmeric (<i>Curcuma longa</i> Linn) -I	0.812	Normal
	Methanol Extract of Turmeric (<i>Curcuma longa</i> Linn) -II	0.871	Normal
	Methanol Extract of Turmeric (<i>Curcuma longa</i> Linn) -III	0.822	Normal

The normality analysis of writing data in the treatment groups, as listed in Table 4.8, using the Shapiro-Wilk test, showed that the distribution of data in all groups, including the control group, standard group, and the three treatment groups with Methanol Extract of Turmeric (*Curcuma longa* Linn), could be considered as a normal distribution. The p-values ranging from

0.812 to 0.871 indicated no significant difference in the normality of the data between groups. These results provide confidence that the data used in analyzing the number of wriggles met the assumption of normality, strengthening the validity of the statistical analysis performed on these parameters.

Table 4. Comparison of the Number of Writhing in All Treatment Groups

Treatment Group	Number of Writhing	P-Value
Control	10.51 ± 2.42 ^a	0.012
Standards	7.24 ± 2.42 ^{ab}	
Methanol Extract of Turmeric (<i>Curcuma longa</i> Linn) -I	9.54 ± 2.64 ^a	
Methanol Extract of Turmeric (<i>Curcuma longa</i> Linn) -II	7.53 ± 2.12 ^{ab}	
Methanol Extract of Turmeric (<i>Curcuma longa</i> Linn) -III	2.23 ± 1.41 ^b	



Data are shown as Mean ± SD. P values are obtained from One Way ANOVA analysis; different superscripts in the same column indicate significant differences.

Table 4. compares the number of writhing in all treatment groups. The One-way ANOVA analysis showed significant differences between groups with a value of p=0.012. The Control group showed a writhing count of 10.51 ± 2.42, while the standard group had a writhing count of 7.24 ± 2.42. The treatment group with Methanol Extract of Turmeric (Curcuma

longa Linn) showed variation, with group I having a writhing count of 9.54 ± 2.64, group II of 7.53 ± 2.12, and group III having the lowest writhing count, which was 2.23 ± 1.41. Different superscripts in the same column indicate a significant difference between the groups. These results illustrate that turmeric methanol extract can potentially affect the amount of writhing in male Wistar rats, with substantial differences, especially in treatment group III, compared to the control and standard groups.

Table 5. Data Normality Analysis with Shapiro-Wilk on Hematology Parameters

Parameters	Treatment Group	P-value	Data Distribution
Hemoglobin (Hb)	Control	0.326	Normal
	Standards	0.477	Normal
	Methanol Extract of Turmeric (Curcuma longa Linn) -I	0.743	Normal
	Methanol Extract of Turmeric (Curcuma longa Linn) -II	0.344	Normal
	Methanol Extract of Turmeric (Curcuma longa Linn) -III	0.475	Normal
Eritrosit (RBC)	Control	0.333	Normal
	Standards	0.033	Abnormal
	Methanol Extract of Turmeric (Curcuma longa Linn) -I	0.734	Normal
	Methanol Extract of Turmeric (Curcuma longa Linn) -II	0.434	Normal
	Methanol Extract of Turmeric (Curcuma longa Linn) -III	0.535	Normal
Leukosit (WBC)	Control	0.933	Normal
	Standards	0.734	Normal
	Methanol Extract of Turmeric (Curcuma longa Linn) -I	0.337	Normal
	Methanol Extract of Turmeric (Curcuma longa Linn) -II	0.333	Normal
	Methanol Extract of Turmeric (Curcuma longa Linn) -III	0.530	Normal
Trombosit (PLT)	Control	0.555	Normal
	Standards	0.733	Normal
	Methanol Extract of Turmeric (Curcuma longa Linn) -I	0.375	Normal
	Methanol Extract of Turmeric (Curcuma longa Linn) -II	0.430	Normal
	Methanol Extract of Turmeric (Curcuma longa Linn) -III	0.535	Normal

Table 5. displays the results of the normality analysis of hematological data using the Shapiro-Wilk test in the control, standard, and three treatment groups with Methanol Extract of Turmeric (Curcuma longa Linn). For hemoglobin (Hb), erythrocytes (RBC), leukocytes (WBC), and platelets (PLT) parameters, the distribution of data in the control, standard, and

all treatment groups can be considered as a normal distribution, except for the erythrocyte parameter in the standard group which shows abnormal distribution (p=0.033). These results provide a basis for the validity of hematological data in the analysis of treatment groups, strengthening the reliability of the interpretation of results on these parameters during this study.



Table 6. Comparison of Hematology Parameters in All Treatment Groups

Treatment Group	Hematologic			
	Hb* (gr/dL)	RBC** (x 10 ⁵ /μL)	WBC* (x 10 ³ /μL)	PLT* (x 10 ³ /μL)
Control	23.52 ± 3.25	7.59 (5.35)	7.72 ± 2.33 ^a	757.50 ± 323.23
Standards	23.02 ± 2.73	7.57 (3.95)	3.23 ± 2.02 ^b	550.53 ± 355.55
Methanol Extract of Turmeric (<i>Curcuma longa</i> Linn) -I	23.32 ± 2.52	7.35 (3.50)	5.35 ± 0.55 ^a	700.52 ± 97.55
Methanol Extract of Turmeric (<i>Curcuma longa</i> Linn) -II	23.07 ± 3.20	7.33 (5.30)	5.09 ± 0.27 ^c	757.30 ± 333.05
Methanol Extract of Turmeric (<i>Curcuma longa</i> Linn) -III	23.35 ± 0.55	7.25 (0.97)	3.32 ± 2.03 ^b	533.55 ± 333.22
P-value	0.531	0.462	0.014	0.531

*Data are shown as Mean ± SD. P values were obtained from A One-way ANOVA analysis; **Data are shown as median (range). P values were obtained from the Kruskal-Wallis analysis; a different superscript in the same column indicates significant differences.

Table 6 presents a comparison of hematological parameters, namely hemoglobin (Hb), erythrocytes (RBC), leukocytes (WBC), and platelets (PLT), in all treatment groups. The analysis results using One Way ANOVA showed significant differences in leukocyte count (WBC) parameters between groups (p=0.014). The control group had a hemoglobin value of 23.52 ± 3.25 gr/dL, erythrocyte count of 7.59 (5.35) x 10⁵/μL, leukocyte count of 7.72 ± 2.33 x 10³/μL, and platelet count of 757.50 ± 323.23 x 10³/μL. The standard group showed hemoglobin values of 23.02 ± 2.73 gr/dL, erythrocyte count of 7.57 (3.95) x 10⁵/μL, leukocyte count of 3.23 ± 2.02 x 10³/μL, and platelets of 550.53 ± 355.55 x 10³/μL. The three treatment groups with turmeric methanol extract had variations in the values of hematological parameters. Still, there was only a significant difference in the number of leukocytes (WBC) between treatment groups (p=0.014). Different superscripts in the same column indicate significant differences. These results provide an overview of the potential effect of turmeric methanol extract on hematological parameters, especially on leukocyte counts, in male Wistar rats.

DISCUSSION

The results showed that the methanol extract of turmeric (*Curcuma longa* Linn) can potentially be an antipyretic and analgesic. One hour after treatment, the control group showed a significant decrease in body temperature compared to the other treatment groups. At 2 Hours and 2 Hours after treatment, body temperature tended to approach the initial condition without significant differences between groups. It is important to note that the group receiving Methanol Extract of Turmeric (*Curcuma longa* Linn)-III showed a more substantial decrease in body temperature at some time after treatment compared to the control and standard groups. A p-value of less than 0.05 several times indicates a significant difference between groups, especially in the Methanol Extract of Turmeric (*Curcuma longa* Linn) -III group. Pain is an unpleasant subjective experience in one part of the body due to harmful stimuli. There are two types

of pain, namely neurogenic and peripheral pain. Peripheral pain is activated through stimulation of nociceptive afferent neurons, while neurogenic pain is activated by pain sensation through afferent input from pain sensation. The hot plate method is used to evaluate the analgesic effect of neurogenic pain, while intraperitoneal injection of acetic acid is used to assess the analgesic effect of peripheral pain. (Nitave, Chougule and Koumaravelou, 2017; Sharma *et al.*, 2020)

The pain sensation induced by acetic acid is a local inflammatory response caused by acetic acid injected into the peritoneum. This localized inflammation occurs through arachidonic acid metabolism from phospholipids in tissues via the cyclooxygenase (PGE2 and PGE2α) and lipoxigenase pathways. Thus, products of the cyclooxygenase pathway, such as PGE2 and PGE2α, and various products of the lipoxigenase pathway will be abundant in the peritoneal fluid. These products of the cyclooxygenase and lipoxigenase pathways cause swelling through cumulative permeability of the capillaries and the release of various endogenous mediators that will stimulate pain in the nerve endings of the nociceptors (Afsar *et al.*, 2015)

Fever is an increase in body temperature exhibited by various living things in response to the invasion of an infectious agent. Brewer yeast is a lipopolysaccharide (exogenous pyrogen), a component of gram-negative bacteria's cell wall. When pyrogens such as lipopolysaccharide (LPS) or brewer yeast enter the body, they damage the natural barrier. The brewer yeast then binds to an immunological protein called Lipopolysaccharide Binding Protein (LBP). This binding promotes the synthesis and release of various endogenous cytokines such as IL-1, IL-5, and TNFα. These endogenous cytokines easily cross the blood-brain barrier and act on the preoptic/ anterior hypothalamus, thus activating the arachidonic acid pathway and synthesizing and releasing prostaglandin E2. PGE2 is produced from the cyclooxygenase-2 pathway, causing an increase in body temperature (Santra *et al.*, 2012; Eldahshan and Abdel-Daim, 2015)

The antipyretic and analgesic effects of Turmeric (*Curcuma longa* Linn) are related to the presence of phenols and flavonoids in Turmeric (*Curcuma longa* Linn). Several studies



have reported the analgesic effects of alkaloids, phenols, and flavonoids. Flavonoids can inhibit the biosynthesis of prostaglandins involved in immunological responses and are also the end product of the cyclooxygenase and lipoxygenase pathways. Additionally, flavonoids also affect protein kinase, one of the regulatory enzymes that can inhibit inflammation (Eldahshan & Abdel-Daim, 2015). In addition to flavonoids, Gaichu et al. (2017) also reported that alkaloids, as phytochemical compounds, inhibit prostaglandin synthesis, which is one of the products of the cyclooxygenase pathway (Gaichu et al., 2017). Therefore, it can be concluded that the analgesic and antipyretic effects of Turmeric (*Curcuma longa* Linn) are due to alkaloids, phenols, and flavonoids. These phytochemical compounds inhibit prostaglandin biosynthesis, thereby preventing the cascade of inflammation and ultimately resulting in analgesic and antipyretic effects.

CONCLUSION

The study indicates that the Methanol Extract of Turmeric (*Curcuma longa* Linn) can act as an antipyretic and analgesic in male Wistar rats, especially at the highest dose (600 mg/kg body weight). The antipyretic and analgesic effects were observed after 5 hours of administration. The turmeric extract group showed a more significant decrease in body temperature than the control and standard groups, with hematological analysis results indicating a substantial reduction with increasing extract dose. These findings suggest that the Methanol Extract of Turmeric (*Curcuma longa* Linn) could be a candidate for further development as an antipyretic and analgesic drug.

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A STUDY ON DIURNAL ACTIVITIES OF CAPTIVE CHIMPANZEES FROM THE ZOOLOGICAL GARDEN ALIPORE, INDIA

Debojyoty Ghosh¹

¹ *Research Assistant, Sundarban Tiger Reserve*
 ORCID: 0000-0002-3478-1867

ABSTRACT

Chimpanzees (Pan troglodytes) are well adapted great apes and best known for the pivotal role in hominid evolution. They are social animals like human. For the conservation purpose, these primates are kept into zoos throughout the world, and India is not an exception. The present study was carried out in The Zoological Garden, Alipore in Kolkata. They show various activities in the ex-situ conservation system. The present study was focused on the general diurnal activities of the adult chimpanzees in ex-situ condition and negative interactions of three adult chimpanzees to the visitors in the summer season (March- April, 2019). The observer found different activities with different anthropogenic cues as well as natural cues. Ad Libitum sampling technique was followed by the instantaneous scan sampling [1] for recording data. Each scan took five minutes with next five minute interval immediately. A mobile alarm (device: ASUS zenfone Max) was used for time maintenance to record the data perfectly. Total ten scans had been done per day to fulfill the objectives. Though the study is not concluding, but this type of effort is the very basic of observing the animals in ex-situ condition.

RESULT & DISCUSSION

Thirteen (13) different kinds of activities along with negative interactions with the visitors were identified and recorded from the instantaneous scan sampling data (Table 1). The activities were categorized into- throwing objects and movements, passivity, bathing, swinging, playing, climbing, foraging, clapping, autogrooming, heterogrooming, offering objects to the visitors, facial expression and keen looking towards the visitors. From the graphical presentation of Fig 1, it is found that Adult male 1 show the activities in varying range rather than Adult male 2 and the female one. Adult female lack these activities, namely- swinging, throwing object- movement, climbing on the poles, clapping, facial expression and keen looking towards visitors.

From Fig 1, the comparative assessment shows that, adult males show a higher percentage in foraging, object throwing, and facial expressions, climbing and swinging on poles. But in case

of the female, autogrooming and heterogrooming activities are seen significantly higher than that of the males. They foraged on natural grass, green leaves and provided foods viz. carrots, cabbage, cauliflower etc.

Being annoyed by the activities of some visitors the chimpanzees threw some objects like vegetables ate, stones and even poop. These peculiar activities of the chimps had considered under negative interaction with the zoo visitors. Male chimpanzees were observed with poop-throwing activity mostly, rather than the female one. A large variety of tool-use behaviors in chimps was well studied by several researchers [2]. The undesirable poop-throwing activity was well studied by several researchers in captive chimpanzees [3] which agree with the recent findings of the observation. Poop throwing activity is considered as stool in the graphical presentation (Fig 2).

Activity	% Ad male 1	% Ad male 2	% Ad female
Throwing objects -Movement	62.50	37.50	0.00
Passivity	81.82	18.18	100.00
Bathing	63.16	36.84	100.00
Swinging	71.43	28.57	0.00
Playing	50.00	50.00	100.00
Climbing	50.00	50.00	0.00
Foraging	75.00	25.00	100.00
Clapping	100.00	0.00	0.00
Autogrooming	66.67	33.33	100.00



Heterogrooming	60.00	40.00	50.00
Offering Objects	100.00	0.00	100.00
Facial expression	100.00	0.00	0.00
Keen looking towards visitors	100.00	0.00	0.00

Table 1: General activities of three adult captive chimpanzees.

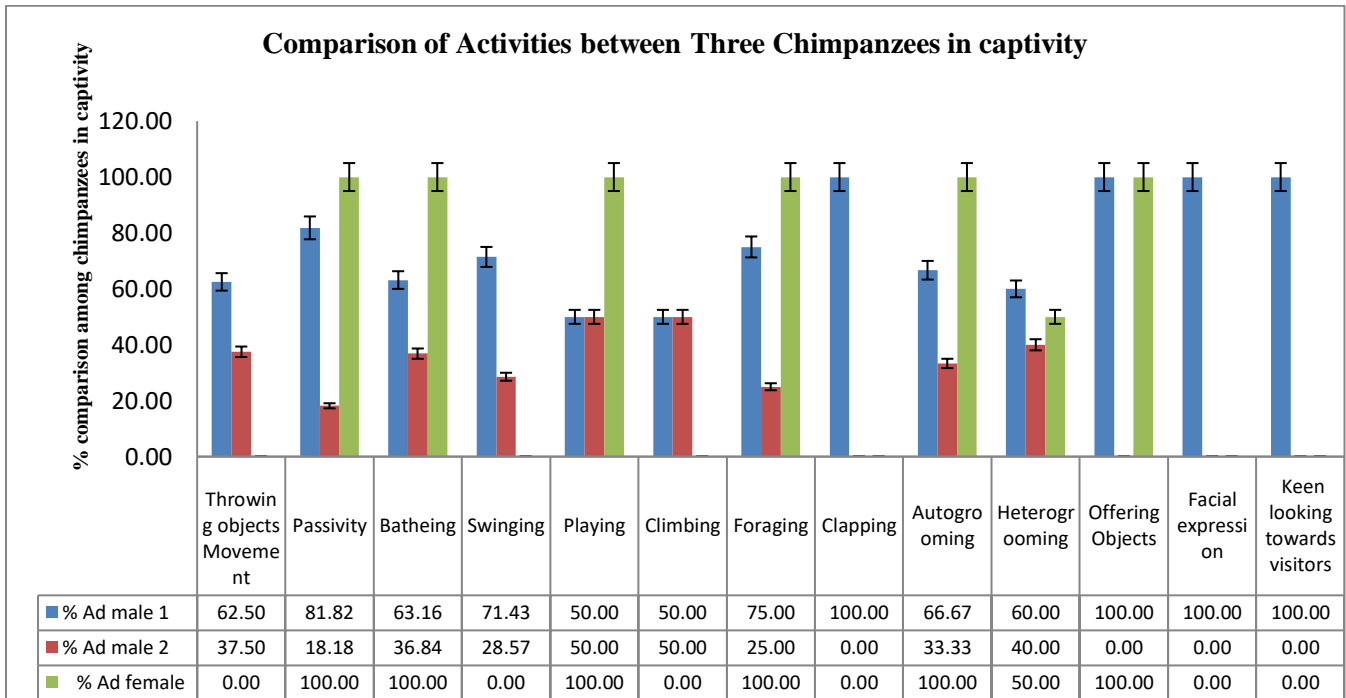


Fig 1: Comparative study of three captive chimps with 5% SE.

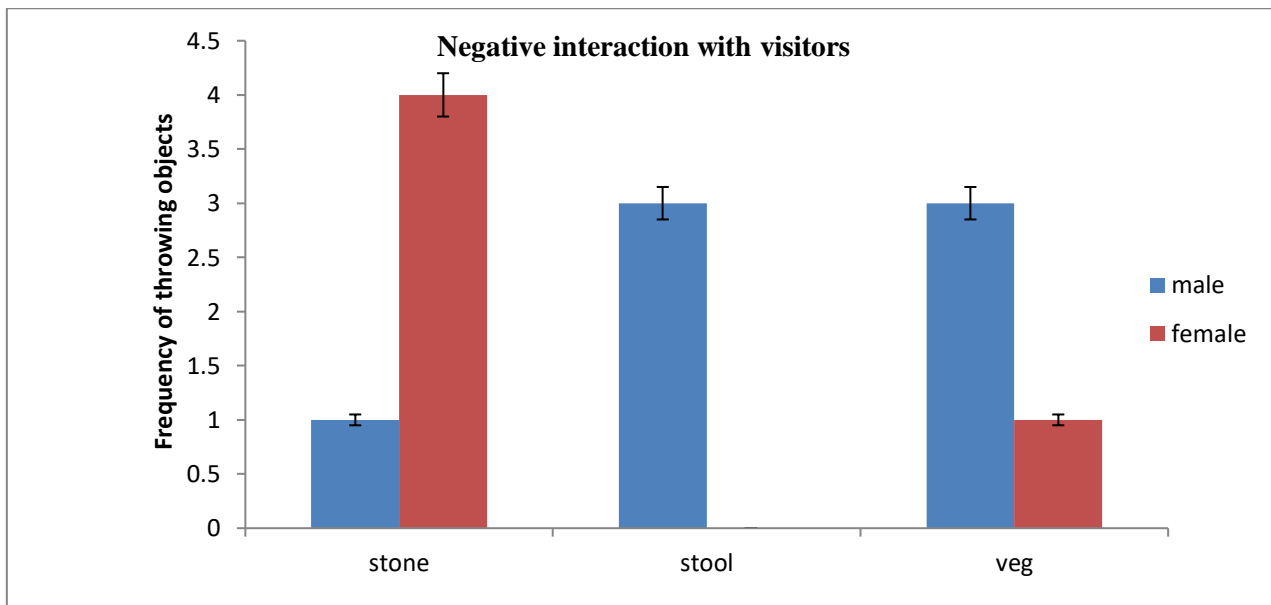


Fig 2: Negative interaction by the compiled data on two males and one female chimpanzees with the visitors with 5% SE.

ACKNOWLEDGEMENTS

The author is thankful to the authority of The Zoological Garden, Alipore and Department of Zoology, West Bengal State University for their kind support for the behavioural study of the captive animals.

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ON THE ISSUE OF CLASSIFICATION OF ANOPHTHALMOS

A.F. Yusupov, D.Kh. Khodzhaev

Republican Specialized Scientific and Practical, Medical center of Eye Microsurgery, Uzbekistan, Tashkent

INTRODUCTION

Anophthalmos or anophthalmic syndrome is characterized by the absence of the eyeball in the orbit. Signs of the disease are characterized by a complete loss of the ability to see on the affected side, changes in spatial perception and increased fatigue during visual work with the healthy eye and a narrowing of the boundaries of the visual field. Anophthalmos is considered a disease whose development requires several negative factors. Based on the results of the studies, the basis for the appearance of intrauterine abnormalities has not been determined. But the most likely causes of the formation of a congenital form of anophthalmos are the appearance of fibrous threads arising in the fetal bladder (amnion) and the influence of ionizing radiation.

Taking into account the period of occurrence, the pathology is divided into acquired and congenital. Unilateral and bilateral anophthalmos are also distinguished. This type of classification is used at the diagnostic stage. In the practice of ophthalmologists, the following forms of the disease are encountered:- Imaginary, that is, the complete absence of an eye. Other orbital structures differ in their usual structure.- True. It is exclusively congenital and in most cases develops together with other developmental defects.

Anophthalmic syndrome refers to loss of vision resulting from the loss of the eyeball. If anophthalmos occurs on one side, binocular vision is lost. Because of this, the boundaries of the visual field are reduced, leading to changes in the perception of space.

It should be noted that today in the literature the above classification is often used to describe anophthalmos, but classifications of types of anophthalmos that would fully reflect the conditions of adjacent tissues, palpebral fissure, bones and tissues of the orbit, the presence and condition of the musculoskeletal stump, fornix and adnexal apparatus, symmetry of the sides were not found by us in literary sources. This circumstance is an urgent problem of ophthalmoplastic surgery and ocular prosthetics, since existing classifications do not fully reflect damage to the organ of vision (orbit and adnexal apparatus) with anophthalmos, which leads to insufficient and inadequate assessment of the condition of adjacent tissues, and thereby the development of various anatomical and cosmetic defects.

TARGET

To develop a classification of anophthalmos taking into account the condition of the tissues of the orbit and the adnexal apparatus of the organ of vision.

MATERIAL AND RESEARCH METHODS

The study material included 457 patients (467 eyes) with anophthalmos of various etiologies. The average age was 35 years. There were 264 men, 193 women. All patients required ocular prosthetics. The period of wearing the prosthesis ranged from 0 to 53 years. On average - 26 years. The initial examination of the patient was carried out by an ophthalmoplastic surgeon together with a master making ocular prostheses (ocularist). When collecting anamnesis, special attention was paid to identifying the cause of anophthalmic syndrome, the duration of the disease, the length of time wearing an ocular prosthesis, the type of previously used ocular prosthesis, the types and number of surgical procedures undergone. An important issue in determining the cause of problems with wearing a prosthesis was the patient's compliance with the rules of hygiene in using it. Timely cleaning of the conjunctival cavity and prosthesis, regular polishing of it from fat deposits and finally replacing the worn prosthesis with a new one every 3 years. All patients underwent standard and special ophthalmological, as well as neuroimaging studies as indicated. Neuroimaging research methods included assessment of the condition of the bones and soft tissues of the orbit and adnexa of the organ of vision using multislice computed tomography of the midface, orbit and paranasal sinuses, as well as other research methods. Standard ophthalmological methods included external examination, biomicroscopy of the conjunctival cavity, and lavage of the lacrimal canals to exclude its obstruction according to indications. During a visual examination, the condition and position of the eyelids, the shape and size of the palpebral fissure were assessed separately and in comparison with the healthy side. It is especially important to correctly assess the condition of the conjunctival fornix for the condition of the epithelial tissue, depth and the presence or absence of scar changes. The condition of the musculoskeletal stump (MSC) is assessed - its presence, shape, size and mobility. The ODC can be in the form of an underdeveloped (congenital) or atrophied (post-traumatic) eyeball, and can also be formed from a special orbital liner or may be absent altogether. The size, shape and location of the ODC formed from the implant from the orbital cavity are also studied.



RESULTS AND DISCUSSION

As a result of the analysis of the examined patients, it was revealed that congenital anophthalmos was in 56 patients (62 eyes), acquired anophthalmos was in 401 patients (405 eyes). Congenital anophthalmos was diagnosed in pediatric patients (mean age 8 years). Of these, 32 were boys and 24 were girls. In patients with congenital anophthalmos, in 53 cases the process was unilateral, in 3 cases it was two-sided. A symmetrical position of the eyelids and palpebral fissure was observed in 36 eyes; in 26 cases, underdevelopment (hypoplasia) of the palpebral fissure was observed. A study of the condition of the conjunctival cavity showed that the depth of all fornixes in 36 eyes was normal, hypoplasia of the upper (4 eyes) was observed in 26 eyes, hypoplasia of the lower (10 eyes) and both fornixes in 12 eyes. In 36 cases an underdeveloped (atrophied) eye was present, in 26 eye orbits it was not detected. Examination of the orbital bones showed its symmetrical development compared to the healthy side in 36 patients and hypoplasia (asymmetry in 26 cases). In a group of patients (401 patients; 405 eyes; men - 223; women 178; average age - 41 years) with acquired anophthalmos, in 399 cases the process was unilateral, in two patients it was two-sided.

The position of the eyelids and the shape of the palpebral fissure in 198 eyes was symmetrical to the healthy side. Changes in the position of the upper eyelid in the form of drooping (pseudoptosis) or sagging (atony) of the lower eyelid were found in 38 and 106 cases, respectively. Scarring of the upper eyelid was noted in 31 cases, the lower in 24 and on both eyelids in 8 cases.

Examination of the conjunctival cavity showed that the musculoskeletal stump was formed in 342 cases, in 63 cases it was not there. The conjunctival vaults in 236 cases were without pathologies, in 106 cases they were flattened (shortened in depth), of which pathological changes were observed in the upper fornix in 19 cases, in the lower 87 cases. Cicatricial changes in the vaults of the conjunctival cavity were as follows. The upper fornix was affected in 16 cases, and the lower in 47 cases.

Changes in the bone tissues of the orbit in patients with acquired anophthalmos were mainly of a post-traumatic nature. Fracture of the orbital walls was observed in 63 cases. Of these, an isolated fracture of the lower wall - 36 cases, a medial wall - 25 cases, and a fracture of more than one wall and involvement of the orbital edges - 2 cases.

Considering the above, to classify anophthalmos in addition to existing types, we propose to subdivide them as follows:

I. Depending on the origin/occurrence of anophthalmos:

a) congenital anophthalmos;

b) acquired;

II. Depending on the side of the lesion:

a) one-sided;

b) double-sided;

III. Depending on the condition of the orbit and the adnexa of the organ of vision in congenital anophthalmos, it is recommended to classify:

a) condition of the eyelids;

evaluate the following parameters:

- symmetry of the healthy side – symmetrical/asymmetrical;
- eyelid hypoplasia – with hypoplasia/normal;
- coloboma of the eyelids – coloboma/ norm.

b) Conjunctival cavity;

evaluate the following parameters:

- Hypoplasia of the vaults – hypoplasia/normal
- at the same time, clarify the inconsistency of which arches – upper/lower/both arches.

- Presence of a rudiment of the eyeball - rudiment of the eyeball / absence of rudiment of the eyeball

c) Orbital bones;

evaluate the following parameters:

- Symmetry of the healthy side - symmetrical/asymmetrical;
- Hypoplasia of the midface - with hypoplasia/normal

IV. Depending on the condition of the orbit and the adnexa of the organ of vision in acquired anophthalmos, it is recommended to classify:

a) condition of the eyelids;

evaluate the following parameters:

- symmetry of the healthy side – symmetrical/asymmetrical;

- hypoplasia of the palpebral fissure – hypoplasia of the main thyroid gland/normal;

- overextension of eyelid tissues after buphthalmos – yes/normal;

- cicatricial deformities – there are deformities / normal.

b) Conjunctival cavity;

evaluate the following parameters:

- condition of the musculoskeletal stump – yes/no

- vaults – consistent (deep)/insolvent

(flattened)/overstretched;

at the same time, clarify the inconsistency of which arches - upper/lower arch.

c) Orbital bones;

evaluate the following parameters:

- Symmetry of the healthy side – symmetrical/asymmetrical;

- deformities – normal/hypoplasia of all walls of the orbital bones/lower wall/inner wall.

Thus, the proposed classification of the state of the visual organ in anophthalmos, which will take into account all the parameters of the eyelids, conjunctival cavity, orbital bones, the presence of a musculoskeletal stump, etc., will contribute to a more detailed assessment of the state of the visual organ in anophthalmos, which will help not only to carry out correct ophthalmoplastic surgical rehabilitation, but also to adequately select suitable individual prosthetics with the help of an ocularist. This circumstance will help improve the quality of life of patients, reduce cosmetic defects and social problems of people with anophthalmos.

CONCLUSION

The proposed classification is simple and concise, takes into account the nature, degree and localization of damage to both the tissues and bones of the orbit and the adnexal apparatus of the organ of vision in anophthalmos, which will contribute to a more adequate differential assessment of tissue damage to the organ of vision and the implementation of correct tactics in the rehabilitation of patients with anophthalmos.



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THE MEDIATING EFFECT OF ATTITUDES TOWARDS MATHEMATICS ON THE RELATIONSHIP BETWEEN ACADEMIC SELF-EFFICACY AND MOTIVATION TO LEARN MATHEMATICS

Jenifer C. Comahig¹, Emmanuel P. Abuzo²

Department of Education, Lavoigan National High School, Governor Generoso, Davao Oriental, Philippines¹

Graduate Education, St. Mary's College of Tagum, Inc., Tagum City, Davao del Norte, Philippines¹

Department of Education, Sawata National High School, San Isidro, Davao del Norte, Philippines²

Article DOI: <https://doi.org/10.36713/epra16217>

DOI No: 10.36713/epra16217

ABSTRACT

The primary purpose of this study was to determine the mediating effect of attitudes towards mathematics on the relationship between academic self-efficacy and motivation to learn mathematics. This study employed a quantitative research design with descriptive and correlational methods. Using stratified random sampling, 254 Grade 10 students were selected as respondents from six secondary public schools of Governor Generoso, Davao Oriental during the school year 2022-2023. Furthermore, this study used three adopted research instruments, all were validated to collect data and used mean, standard deviation, and Pearson-r as statistical treatment. The findings showed that academic self-efficacy and motivation to learn math among the students are high, while their attitude towards mathematics is moderate. The findings revealed that academic self-efficacy significantly positively correlates with motivation to learn math, academic self-efficacy significantly positively correlates with attitude towards mathematics, and attitude towards mathematics significantly positively correlates with motivation to learn math. Moreover, attitude towards mathematics partially mediates the relationship between academic self-efficacy and motivation to learn math. These results encourage educators and administrators to take steps for better teaching and learning mathematics. Furthermore, better application of the results demands replication of similar studies in the field of education. This will validate the durability of these relationships beyond the present research setting and contribute to the body of knowledge for a better understanding of different issues and concerns related to attitude towards mathematics, academic self-efficacy, and motivation to learn mathematics.

KEYWORDS: Academic self-efficacy, motivation to learn mathematics, attitudes towards, Grade 10 students, descriptive-correlational design, mediation analysis, Governor Generoso, Davao Oriental, Philippines.

BACKGROUND OF THE STUDY

For years, students' motivation to learn mathematics has declined due to several factors influencing it. Some factors that lower students' motivation to learn mathematics include their negative attitude towards mathematics, poor teaching strategies, low sense of logic and reasoning, and poor understanding of mathematical concepts and problem-solving (Arthur et al., 2022). Moreover, Mamolo (2022) stressed that students in current learning faced challenging situations that lowered their motivation to learn, such as a lack of focus and concentration.

Globally, many schools in developing countries have expressed their worries to students with low motivation to learn mathematics (Nyman & Sumpter, 2019). A study by Tran and Nguyen (2021) on high school learners in Vietnam found that some learners have low motivation in mathematics since they lack interest in learning mathematical tasks. Moreover, a study of Nenthien and Loima (2019) on high school learners found that the students in one of the schools in Thailand have low

intrinsic motivation in mathematics as manifested by their low interest in learning the subject. In India, a study of Mistry (2020) on the mathematics motivation of middle school students found that around 30 percent of students have low motivation to learn mathematics based on the national assessment.

In the Philippines, mathematics is considered a difficult subject for students, which causes them to be unmotivated and lose their interest in learning the subject (Bernardo et al., 2022). A study of Reyes (2019) found that 7 out of 10 students in the public schools have lower mathematics motivation, as observed by their low interest in learning mathematics. Moreover, this low interest towards mathematics has affected mathematics motivation as manifested by their dislike with the subject, fear, struggles, frustrations, and discomfort. This has been supported by the research of Bernardo et al. (2022) that 20% of students demonstrate low motivation in learning mathematics due to their low interest and focus towards the subject.



Moreover, a meta-analytical study of Callaman and Itaas (2020) on students in Davao Region revealed that some students in secondary schools have low motivation to learn mathematics. In their study, this low motivation to learn is manifested by negative or loss of interest in learning mathematics. In a similar study of Alipio (2020) on the Grade 10 students in Davao revealed that some students have low mathematical motivation as observed in the 12.2% dropout rate in the entire region, with Davao City accounting for the highest dropout rate of 4.8 percent.

The researcher did an extensive review of the related literature on the variables that could affect students' motivation to learn math. With this, the researcher found that academic self-efficacy and attitude towards mathematics were the variables that could affect students' motivation to learn math (Laranang, 2022). However, the researcher also discovered that the related studies are bivariate in nature and had not come across with research where these three variables are used in a study. Hence, there is a dearth of information on the mediating effect of attitude towards mathematics on the relationship between academic self-efficacy and motivation to learn math among students.

In order to solve some issues and concerns related to mathematics motivation, the researcher emphasized that there is a sense of urgency to conduct this study in order to determine the connection of the variables to the junior high school students who are the respondents. This study would make the mathematics educators aware on how students' motivation can be improved so they would love and learn the subject more.

The results of the study could also be the basis in creating policy briefs, programs, and interventions for teaching and learning. Moreover, this study could be relevant in the community as it would help students to become motivated in learning mathematics which could impact how they deal with things that involve numbers, such as business, budgeting, and the economy. Further, the results of the study will be presented in public forums, training, and conferences in both local and regional levels. At the school level, the findings of the study can be presented in the Learning Action Cell (LAC) sessions among mathematics teachers. This study will be published in international journals and publications.

STATEMENT OF THE PROBLEM

This research aimed to determine the mediating effect of mathematics attitude on the relationship between academic self-efficacy and mathematics motivation of Grade 10 students in the selected schools in Governor Generoso South and North Districts, Division of Davao Oriental. Specifically, this research sought the answer the following questions:

1. What is the level of academic self-efficacy of students in terms of:
 - 1.1 Perceived Control;
 - 1.2 Competence;
 - 1.3 Persistence; And
 - 1.4 Self-Regulated Learning?

2. What is the level of motivation to learn math in terms of:
 - 2.1 Value Components;
 - 2.2 Expectancy Component; And
 - 2.3 Affective Component?
3. What is the extent of attitude towards mathematics in terms of:
 - 3.1 Anxiety;
 - 3.2 Confidence;
 - 3.3 Enjoyment; And
 - 3.4 Benefits/Value?
4. Is there a significant relationship between:
 - 4.1 Academic self-efficacy and motivation to learn math?
 - 4.2 Academic self-efficacy and attitude towards mathematics?
 - 4.3 Attitude towards mathematics and motivation to learn math?
5. Does attitude towards mathematics significantly mediate the relationship between academic self-efficacy and motivation to learn math?

METHODOLOGY RESEARCH DESIGN

A quantitative research design with descriptive and correlational methods is employed in this study since the researcher would seek to gather and interpret numerical data on the mediating effect of attitudes towards mathematics on the relationship between academic self-efficacy and motivation to learn mathematics without manipulating the variables. The researcher used the correlational technique to establish the relationship between attitude towards mathematics, academic self-efficacy, and motivation to learn mathematics. Since this study involved mediation whether attitude towards mathematics mediates the linkage of academic self-efficacy and motivation to learn math, a quantitative descriptive correlational design was employed. The study employed mediation to explain how attitudes toward mathematics mediate the linkage of academic self-efficacy and motivation to learn mathematics.

STATISTICAL TREATMENT OF DATA

To interpret and analyze the data thoroughly and correctly, the following statistical tools were being used:

Mean. This was used to determine the level of academic self-efficacy, attitude toward mathematics, and motivation to learn math.

Standard Deviation. This was used to measure the dispersion of the data set from its mean. This was presented in tables alongside the mean and was used to determine the degree of dispersion or proximity of the mean scores.

Pearson r. This statistical treatment is used to determine the significant relationship between academic self-efficacy and attitude towards mathematics, attitude towards mathematics and motivation to learn math, and academic self-efficacy and motivation to learn math.

Mediation Analysis using Sobel Z-test. This was used to determine the mediating effect of attitudes toward mathematics



on the relationship between self-efficacy and motivation to learn math.

RESEARCH RESPONDENTS

In this study, the respondents were Grade 10 students among the population in Governor Generoso South and North Districts, Division of Davao Oriental enrolled in the school year 2022-2023. These Grade 10 students were the chosen respondents since among the junior high school students, they were mature enough to understand and answer the questionnaires.

The Raosoft sample size calculator was used to gauge the sample size of 254 from among the total population of 746 which was set at a 5% margin of error. The Governor Generoso South and North Districts consist of six public secondary schools. Using stratified random sampling techniques, the number of samples from School A was 95, School B was 57, School C was 46, School D was 23, School E was 18, and School F was 15. The researcher used a stratified random sampling technique to ensure that there was an equal distribution of respondents in each school within Governor Generoso's South and North Districts, Division of Davao Oriental.

RESULTS AND DISCUSSION

The following are the results of the study.

Table 1

Summary on the Level of Academic Self-Efficacy

Indicators	Mean	SD	Description
Perceived Control	2.96	0.74	High
Competence	2.73	0.44	High
Persistence	2.98	0.51	High
Self-Regulated Learning	2.96	0.50	High
Over-all Mean	2.91	0.42	High

It has an overall mean of 2.91 and is described as equivalent to high. This furtherly signifies that the level of academic self-efficacy is very evident. The standard deviation of academic self-efficacy as reflected in the responses of the respondents is 0.42. This indicates the homogeneity of the responses of the respondents. This also implies that a significant number of responses on academic self-efficacy of students is clustered to the mean. In addition, students believe in their ability to excel. It also encompasses their confidence in tackling mathematical problems, grasping mathematical concepts, and performing well in math-related concepts

The results agree with the study of Yokohama (2019) that revealed a high level of academic self-efficacy in students' which includes perceived control and a remarkable capacity to navigate through challenges and uncertainties with confidence. Similarly, the study of Bhati et al. (2022) claimed that students' academic self-efficacy is manifested in high competence and belief that they can approach tasks and endeavors with

conviction and that their actions can make a difference, and persist in the face of obstacles. Khan (2020) also asserted academic self-efficacy, particularly in strong persistence, a heightened sense of control proactively seeking solutions, creating strategies, and overcoming hurdles. Gambo (2021) also supported the findings of the study by emphasizing the academic self-efficacy of students and highlighted self-regulated learning in terms of emotional responses in a constructive manner and managing stress effectively.

Table 2

Summary of the Level of Motivation to Learn Math

Indicators	Mean	SD	Description
Value components	3.54	0.71	High
Expectancy component	3.46	0.70	High
Affective component	3.46	0.81	High
Over-all Mean	3.48	0.60	High

Moreover, it has 3.48 as an overall mean and is described as equivalent to high, which means that the level of motivation to learn math is much observed. The dispersion of motivation to learn math determined by the responses of the respondents showed a 0.60 standard deviation. This suggests that the majority of respondents have responses that are similar and are close to the mean. In addition, the findings show that students enjoyed learning mathematics, and put some effort into learning the subject even better. When students believe in their ability to solve math problems and understand how math connects to their real-world experiences, their motivation is enhanced. Students with strong motivation tend to have higher self-confidence in learning the subject. As students build their mathematical skills and see the direct application of math to real-world scenarios, they often develop a sense of competence and motivation that goes beyond mathematics. Furthermore, with higher motivation, students have at most willingness to engage in mathematical activities for better academic achievement.

The findings conformed with the study of Arthur et al. (2022) which shows high evidence of students cultivating and sustaining motivation in mathematics and emphasizes student's strong belief in creating a positive learning experience and fostering a lasting love for the subject. Similarly, it is further supported by Prast et al. (2018) who stressed that students are motivated and believe in a growth mindset, viewing mistakes and challenges as opportunities for learning and improving. The findings also conformed to the study of Tran and Nguyen (2021) who found high evidence of students' belief that motivation to learn math is crucial in learning mathematics and for enhancing their mathematical ability.



Table 3

Summary of the Level of Attitude towards Mathematics

Indicators	Mean	SD	Description
Anxiety	2.89	0.97	Moderate
Confidence	3.15	0.85	Moderate
Enjoyment	3.40	0.90	High
Benefits/ Value	3.91	0.86	High
Over-all Mean	3.34	0.65	Moderate

The result implies that the level of attitude towards mathematics of students is observed since it has a mean overall of 3.34 and is described as equivalent to moderate. As shown in the analyzed responses of the respondents, the spread of attitude toward mathematics revealed the standard deviation is 0.65. This suggests that the majority of respondents have responses that are similar and are clustered to the mean. In addition, students demonstrate that they have different attitudes toward mathematics, reflecting the diverse ways in which they perceive and interact with the subject. Some students approach mathematics with anxiety, confidence, enjoyment, and benefits/value, finding joy in solving mathematical problems and recognizing the subject's practical applications. They may view math as a fascinating puzzle to be unraveled, and their positive attitude often leads to success in the subject.

The result is supported by the study of Hwang and Son (2021) which revealed synonymous results on attitudes towards mathematics where students' experiences with mathematics, both positive and negative, shape their attitudes about the subject. It is also supported by the study of Davadas and Lay (2019) which shows high evidence that attitudes towards mathematics in terms of anxiety affect their cognitive functioning. They further emphasize strong results on students' experiences of math anxiety, working memory, and level of problem-solving. The result of the study is also supported by Mullis et al. (2020) which highlighted learners' positive attitude about mathematics, higher regard for the subject, giving importance, and feeling confident using these attitudes in their studies.

Table 4

Relationship Between Academic Self-Efficacy and Motivation to Learn Math

Independent Variables	Motivation to Learn Math		Remarks
	r	p-value	
Academic Self-Efficacy	.580	0.000	Significant

Table 4 presents the result of the relationship between academic self-efficacy and motivation to learn math. The study revealed the result that academic self-efficacy and motivation to learn math are significantly positively correlated. The significant positive correlation between academic self-efficacy and motivation to learn math ($p < 0.05$) is shown. The r-value of .580 implies that academic self-efficacy and motivation to learn math have a moderate positive correlation. This means that

when the academic self-efficacy among Grade 10 students is moderate, their motivation to learn math is also moderate. This further indicates that there is a significant relationship between academic self-efficacy and motivation to learn math, therefore, the null hypothesis is rejected.

The result conforms with the findings of Khan (2020) that students with higher academic self-efficacy tend to get motivated to learn mathematics. In addition, Yokohama (2019) emphasized that when students have higher academic self-efficacy and believe in their ability to excel in math, they are more inclined to be motivated to learn it. Moreover, Foulstone and Kelly (2019) also claimed that if students display strong evidence of having academic self-efficacy in math, they have a greater tendency to approach mathematical problems with confidence and persistence.

Table 5

Relationship Between Academic Self-Efficacy and Attitude Towards Mathematics

Independent Variables	Attitudes Towards Mathematics		
	R	p-value	Remarks
Academic Self-Efficacy	.640	0.000	Significant

Presented in Table 5 is the result of the relationship between academic self-efficacy and attitude toward mathematics. The study revealed the result that academic self-efficacy and attitude toward mathematics have a significant positive correlation. The result shows that academic self-efficacy and attitude towards mathematics ($p < 0.05$) are significantly positively correlated. The r-value of .640 implies a strong positive correlation between academic self-efficacy and attitude toward mathematics. This means that when the academic self-efficacy among Grade 10 students is high, their attitude towards mathematics is also high. This further indicates that there is a significant relationship between academic self-efficacy and attitudes towards mathematics. This, therefore, means that the null hypothesis is rejected.

The result is supported by the findings of Esteban et al. (2022) that when a student possesses high academic self-efficacy in mathematics, they have a higher tendency to develop a positive attitude towards the subject. This is because their confidence in their ability to tackle mathematical challenges fosters a sense of competence and accomplishment, which in turn, contributes to a favorable attitude (Zakariya, 2022). In addition, Neroni et al. (2022) emphasized that students with high levels of self-efficacy foster a positive attitude toward mathematics, making them more receptive to mathematical learning. Falconer and Djokic (2019) also claimed that students are more likely to view math as a conquerable realm approach problem with enthusiasm, and persevere through difficulties. This positive attitude can further enhance students' learning experience and willingness to explore mathematical concepts (Mazana, 2019).



Table 6

Relationship Between Attitude towards Mathematics and Motivation to Learn Math

Independent Variables	Motivation to Learn Math		Remarks
	r	p-value	

Table 6 presents the result of the relationship between attitude towards mathematics and motivation to learn math. The study revealed the result that attitude towards mathematics positively correlates with motivation to learn math. It shows that attitude towards mathematics and motivation to learn math ($p < 0.05$), has a significant positive correlation between. The r-value .449 implies that attitude towards mathematics and motivation to learn math are moderately positively correlated. This means that when the attitude towards mathematics among Grade 10 students is high, their motivation towards math is also high. This further indicates that there is a significant relationship between attitude towards mathematics and motivation to learn math. Therefore, the null hypothesis is rejected.

The above findings are supported by the study of Davadas and Lay (2019) that students' attitude towards mathematics is affected by their cumulative encounters with the subject, which leads to an increased motivation to learn mathematics and that when students perceive math as an interesting and relevant, they are more motivated to learn the subject. This is also supported by Mullis et al. (2020) that learners possess a positive attitude toward mathematics and have higher regard for the subject, understand it as important, and feel motivated and self-assured in using it in their studies. Chen et al. (2018) also claimed that the attitude of students towards mathematics has a favorable influence on their motivation and success and that students who foster a positive attitude towards mathematics have higher motivation in the subject. The findings are parallel to the proposition of Langat (2011) who highlighted a strong relationship between attitudes towards mathematics and motivation to learn math and that individual mathematics attitude also determines the extent to which one will be interested and motivated to listen, answer assignments, make projects, and participate in class.

Table 7

Steps in Mediation Analysis

Independent Variable (IV)	Academic Self-Efficacy
Dependent Variable (DV)	Motivation to Learn Mathematics
Mediating Variable (MV)	Attitudes Towards Mathematics

Step 1: Path C (IV and DV)

Unstandardized Beta (β)	0.713
Standard Error (e)	0.0.96
p-value	0.000

Step 2: Path B (MV and DV)

Unstandardized Beta (β)	0.122
Standard Error (e)	0.061
p-value	0.000

Attitude towards Mathematics	.449	0.000	Significant
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Step 3: Path C (IV and MV)

Unstandardized Beta (β)	1.003
Standard Error (e)	0.076
p-value	0.000

Step 3: Combined Influence of IV and MV on DV

Attitude Towards Mathematics

Standardized Beta	0.133
Part Correlation	0.125
Total R-Square	0.341

Academic Self-Efficacy

Unstandardized Beta	0.713
Standard Error(e)	0.096
Standardized Beta	0.495
Part Correlation	0.426

The results in Table 7 revealed a significant relationship between academic self-efficacy and motivation to learn mathematics ($H4,1: \beta = 0.713, p < 0.000$). Moreover, a significant relationship is found between attitudes towards mathematics and motivation to learn math ($H4,2: \beta = 0.122, p < 0.000$). Academic self-efficacy and attitude towards mathematics have also a significant relationship ($H4,3: \beta = 1.003, p < 0.000$). With the inclusion of attitudes towards mathematics, the impact of academic self-efficacy on motivation to learn mathematics became significant ($H4,4: \beta = 0.133, p < 0.000$). The indirect effect of academic self-efficacy on motivation to learn mathematics through attitude towards mathematics was found significant. This shows the relationship between academic self-efficacy and motivation to learn mathematics has partial mediation by attitude towards mathematics.

To support the result above, the study of In'am (2021) revealed how the academic self-efficacy of the students and their motivation to learn the subject are influenced by their behavior and participation in mathematics-related activities. The study of Paguican and Torreon (2020) highlighted that learning mathematics depends upon the student's attitude, self-efficacy, and motivation. Laranang and Bondoc (2020) also mentioned that students should exert effort to develop a positive attitude towards mathematics through self-confidence to become more motivated to learn the subject.

RECOMMENDATIONS

The following recommendations are suggested based on the findings and conclusions presented:

1. Students should engage in activities that will help them develop a higher positive attitude towards mathematics which could yield positive impacts in



developing stronger motivation to learn the subject. Moreover, students must exercise willingness to continue working hand in hand with their classmates, peers, parents, and teachers to maintain the high academic self-efficacy that affects their motivation to learn mathematics.

2. Teachers must provide students with classroom-based activities that are relevant to their daily lives so that students will develop positive attitudes toward learning mathematics. It is suggested that teachers should value contextualization of mathematics learning activities for students to be more driven to do and learn mathematics as they may view their learning to be useful and meaningful to real life.
3. Administrators, policymakers, and curriculum designers must recognize that academic self-efficacy, motivation to learn math, and attitudes towards mathematics are interconnected. With this, they may initiate comprehensive support systems that address all these aspects simultaneously. This can include peer support networks, training, workshops, and seminars that focus on improving these facets of learning mathematics.
4. Future researchers may examine and use the results of this study to create and design activities, interventions, and strategies that could help maintain high academic self-efficacy, increase students' positive attitudes towards mathematics, and establish strong students' motivation to learn mathematics.

CONCLUSIONS

Based on the reflected results and findings of this study, the researcher drew the following conclusions below:

1. Academic self-efficacy is high among Grade 10 students.
2. Motivation to learn math is high among Grade 10 students.
3. Attitude towards mathematics is moderate among Grade 10 students.
4. Academic self-efficacy of Grade 10 students has a positive significant relationship with their motivation to learn mathematics.
5. Academic self-efficacy of Grade 10 students has a positive significant relationship with their attitude towards mathematics.
6. The attitude towards mathematics of Grade 10 students has a positive significant relationship with their motivation to learn mathematics.
7. Attitude towards mathematics of Grade 10 students partially mediates the relationship between academic self-efficacy and motivation to learn mathematics.

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ANALYSIS OF FACTORS AFFECTING EXCLUSIVE BREASTFEEDING AT KIA POLYCLINIC ROYAL PRIMA HOSPITAL MEDAN

Shao Liyang¹, Johannes Bastira Ginting²

¹Master of Clinical Medicine Study Program, Department of Clinical Medicine, Faculty of Medicine, Dentistry and Health Sciences, Universitas Prima Indonesia

²Public Health Study Program, Department of Public Health, Faculty of Medicine, Dentistry and Health Sciences, Universitas Prima Indonesia

ABSTRACT

This study aims to evaluate the factors that influence exclusive breastfeeding practices at the MCH clinic of Royal Prima Hospital Medan in 2024. Breast milk is an essential source of nutrition for infants due to its balanced composition, providing optimal support for their growth and development. In this study, the method used was non-experimental quantitative research with a descriptive approach and associative analysis. The study population included 144 individuals, with 110 respondents taken as samples through an incidental sampling technique based on predetermined criteria. Data analysis used univariate, bivariate, and multivariate approaches to evaluate independent variables such as Age, Education Level, Employment Status, Knowledge, Attitude, and Family Support on the dependent variable, exclusive breastfeeding. The analysis showed that all independent variables had a significant association with exclusive breastfeeding, with a p -value ≤ 0.05 , which rejected the null hypothesis. Notably, the knowledge variable had the highest Odds Ratio (OR), indicating that a higher level of knowledge in mothers was associated with a greater chance of exclusively breastfeeding their infants. In conclusion, a better understanding of the benefits of exclusive breastfeeding could be an essential factor in improving exclusive breastfeeding practices in the community.

KEYWORDS: Exclusive Breastfeeding, Balanced Nutrition, Factor Analysis, Knowledge Level, Odds Ratio

BACKGROUND

Health organizations such as WHO, AAP, AAFP, and IDAI recommend exclusive breastfeeding up to 6 months of age to reduce infant morbidity and mortality. Breast milk provides optimal nutrition protection against disease and supports the baby's immune system. Mothers must understand and follow these recommendations for their baby's health (Lindawati 2019). The coverage of exclusive breastfeeding in Indonesia in 2019 reached 67.74%, exceeding the strategic plan target of 50%, showing a significant improvement in this practice. West Nusa Tenggara recorded the highest percentage, reflecting local governments' successful promotion and support. Based on Riskesdas 2018, breastfeeding patterns vary: exclusive breastfeeding 37.3%, partial breastfeeding 9.3%, predominant breastfeeding 3.3%. Exclusive breastfeeding is higher in urban areas (40.7%) than rural areas (33.6%), influenced by access to information and health support. East Nusa Tenggara leads the way in breastfeeding, reflecting provincial efforts and local government support (Ratnasari et al. 2021).

Breast milk is a balanced source of essential nutrients for a baby's growth. WHO set a 50% exclusive breastfeeding target for six months by 2025, reducing infant morbidity and mortality. It needs to be promoted for a healthier generation (Radharisnawati, Kundra, and Pondaag 2017). Although breast milk is considered ideal for babies, challenges in practice still exist. One of them is the mother's knowledge and awareness of

exclusive breastfeeding. Accurate information support and a conducive environment are essential for successful breastfeeding. Previous research (Ratnasari, 2021) identified education, knowledge, perception, and husband support as factors that influence exclusive breastfeeding, with perception being the dominant factor (Ratnasari et al., 2021). From the description above, researchers are interested in researching Factors Affecting Exclusive Breastfeeding at KIA Polyclinic Royal Prima Hospital Medan in 2024.

RESEARCH METHODS

This research is quantitative and non-experimental, with a descriptive approach (cross-sectional survey) and associative analysis. Quantitative methods are based on positivism, collect data from populations/samples using research instruments, and test hypotheses. A descriptive approach is used to observe independent variables without making comparisons to obtain data corresponding to the research problem and draw a conclusion. This research was conducted at the KIA Polyclinic of Royal Prima Hospital Medan in January 2024. This study's population is all mothers with children under three years old at the KIA Polyclinic of Royal Prima Hospital Medan in 2024, with as many as 144 people. Determination of the sample using the Slovin formula $n = 105.8$ was adjusted by the researcher to 110 respondents, a synthetic technique. The data analysis used in this study was univariate, bivariate, and multivariate.



RESEARCH RESULTS

Table 1. Chi-Square Test Table of Exclusive Breastfeeding Variables at the MCH Polyclinic of Royal Prima Hospital Medan in 2024.

Variable	Category	Exclusive breastfeeding		Total	Df	p-value
		Yes	Not			
Age	<35 years	62	8	70	1	0.011
		56%	7%	64%		
	>35 years	18	22	40		
		16%	20%	36%		
Total		80	30	110		
		73%	27%	100%		
Education Level	School	49	18	67	1	0.008
		45%	16%	61%		
	No School	31	12	43		
		28%	11%	39%		
Total		80	30	110		
		73%	27%	100%		
Employment Status	Work	23	12	35	1	0.012
		21%	11%	32%		
	Not Working	57	18	75		
		52%	16%	68%		
Total		80	30	110		
		73%	27%	100%		
Knowledge	Good	63	26	89	1	0.002
		57%	24%	81%		
	Bad	17	4	21		
		15%	4%	19%		
Total		80	30	110		
		73%	27%	100%		
Attitude	Good	62	22	84	1	0.001
		56%	20%	76%		
	Bad	18	8	26		
		16%	7%	24%		
Total		80	30	110		
		73%	27%	100%		
Family Support	Exist	72	18	90	1	0.000
		65%	16%	82%		
	Not	8	12	20		
		7%	11%	18%		
Total		80	30	110		
		73%	27%	100%		

Source: Primary Data processed in 2024



Based on Table 1, the Chi-Square test obtained the Age variable; there are two categories, namely <35 years and >35 years. In the <35 years category, 62 respondents gave exclusive breastfeeding, and eight respondents did not provide exclusive breastfeeding, while in the >35 years category, 18 respondents provided exclusive breastfeeding, and 22 did not. The statistical test results showed a p-value of 0.011, indicating a significant relationship between Age and Exclusive Breastfeeding. Furthermore, for the Education Level variable, the School category had 49 respondents who provided exclusive breastfeeding and 18 respondents who did not offer exclusive breastfeeding. In comparison, the Not School category had 31

respondents who provided exclusive breastfeeding and 12 respondents who did not offer exclusive breastfeeding. The p-value for this variable is 0.008, indicating a significant relationship between Education Level and Exclusive Breastfeeding. Likewise, for the variables Employment Status, Knowledge, Attitudes, and Family Support, the statistical test results showed significant p-values, namely 0.012, 0.002, 0.001, and 0.000, respectively, indicating that these variables had an essential relationship with exclusive breastfeeding. The data source used is Primary Data processed in 2024.

Table 2 Enter Method Logistic Regression Test Table, Research Variables Determinants of Exclusive Breastfeeding at the MCH Polyclinic of Royal Prima Hospital Medan in 2024.

Variable	B	S.E.	Wald	Df	Sig.	OR
Age	-3,393	0,647	23,506	1	0,003	2,987
Education Level	-1,526	0,469	10,600	1	0,891	-0,138
Employment Status	-2,219	0,538	17,012	1	0,954	0,057
Knowledge	-2,618	0,528	24,557	1	0,000	4,149
Attitude	-3,778	0,689	22,125	1	0,009	2,741
Family Support	-2,626	0,534	19,504	1	0,012	2,024

Source: Primary Data processed in 2024

Based on Table 2, a multivariate test with a logistic regression method using an enter approach shows that the knowledge variable has the highest Odds Ratio (OR) of 4,149. This indicates that the higher the level of knowledge a mother has about the benefits of exclusive breastfeeding, the 4,149 times the chance of exclusive breastfeeding for her baby.

DISCUSSION

The Chi-square test results showed an age variable p-value of 0.011 (< 0.05), showing a statistically significant relationship between age and exclusive breastfeeding at the KIA Polyclinic of Royal Prima Hospital Medan in 2024. The most optimal age for pregnancy, childbirth, and breastfeeding for mothers is 20 years - 35 years and is usually referred to as healthy reproductive age. This is because, at this time, the reproductive organs and psychology of the mother are ready to accept the presence of the baby. So, this age is the right age to give breast milk exclusively. The success rate of breastfeeding practice for six months is higher in young mothers than in old age. In addition, the increasing age of the mother is associated with increasing experience in breastfeeding, maturing mindset, and working. Mothers of healthy reproductive age can produce more milk compared to mothers aged >35 years. The age of <20 years is associated with not being psychologically ready to become a mother and at risk of depression, and breast milk does not come out when breastfeeding.

The results of the Chi-square statistical test obtained a variable p-value of education level of 0.008 with a sig of 0.05. So statistically, the variable level of education has a significant

relationship with exclusive breastfeeding at the KIA Polyclinic of Royal Prima Hospital Medan in 2024. Success factors in breastfeeding include maternal commitment, Early Initiation, correct breastfeeding position, breastfeeding at the baby's request, and exclusive breastfeeding. The level of education affects a person's ability to make decisions, especially related to exclusive breastfeeding in infants 0-6 months. Higher education provides more significant knowledge about the benefits of breastfeeding, thereby increasing commitment and rational response to the challenges faced. In comparison, lower education can hinder understanding of the message or information conveyed and reduce the commitment required to breastfeed exclusively.

The results of the Chi-square statistical test show the p-value of the Job Status variable of 0.012, which is smaller than the significance level (sig) of 0.05. This means, statistically, the Employment Status variable has a significant relationship with Exclusive Breastfeeding at the KIA Polyclinic of Royal Prima Hospital Medan in 2024. The results of this study are in line with Rochmayani's research (2019), which states that statistically, there is a significant relationship between the level of maternal education and the practice of exclusive breastfeeding (p-value 0.01 < 0.05) in the Ngaliyan District of Semarang City in 2019 (Rochmayani 2019). Chi-square statistical test results obtained a p-value Knowledge variable of 0.002 with a sig of 0.05. So statistically, the Knowledge variable has a meaningful relationship with Exclusive Breastfeeding at the KIA Polyclinic of Royal Prima Hospital Medan in 2024. Respondents' lack of knowledge about



breastfeeding has been linked to exclusive breastfeeding, which aligns with Lawrence Green's theory, which highlights knowledge as a predisposing factor that influences a person's behavior. Knowledge of exclusive breastfeeding includes the mother's understanding of breastfeeding during the first six months and the importance of breastfeeding immediately after birth to obtain antibody-rich colostrum. This illustrates that correct knowledge influences the mother's decision to breastfeed exclusively, following health recommendations.

The knowledge that mothers have about exclusive breastfeeding is very influential on the decision to give exclusive breastfeeding to their babies. The better a mother's knowledge of exclusive breastfeeding, the more likely she is to breastfeed her baby exclusively. Conversely, if the mother's knowledge about exclusive breastfeeding is low, then the possibility of exclusive breastfeeding is also low. In addition to education, other factors influencing the mother's decision to breastfeed exclusively are the mother's age and occupation. Exclusive breastfeeding is breastfeeding to babies without complementary foods for 0-6 months. Some reasons that may make mothers not provide exclusive breastfeeding include problems with breast milk not running smoothly or the release of milk in small quantities, as well as issues with nipples that tend to go inside. To overcome this, it is essential to teach breast care to mothers so that they understand the concept and importance of exclusive breastfeeding (Rumiyati 2011).

Chi-square statistical test results obtained a *p-value* Attitude variable of 0.001 with a sig of 0.05. So statistically, the Attitude variable has a meaningful relationship with Exclusive Breastfeeding at the KIA Polyclinic of Royal Prima Hospital Medan in 2024. This study's results align with the research of Sabrina et al. (2022), which found a significant relationship between mothers' knowledge and attitudes toward exclusive breastfeeding at RSIA Makassar City in November 2021 (Sabrina et al. 2022). Mothers' positive attitudes towards exclusive breastfeeding practices do not always have an impact on the actual actions of exclusive breastfeeding of their babies. Attitudes need to be supported by external factors such as support from health workers, family, or those closest to the mother so that it can be manifested in concrete actions. Knowledge plays a vital role in shaping a person's attitude, as knowledge can influence a positive or negative attitude toward an action. Good attitude conditions tend to approach and support an object, while negative attitudes tend to stay away from and not support the object. It can be concluded that the negative attitude of respondents towards exclusive breastfeeding is most likely related to the low level of knowledge.

Chi-square, statistical test results, obtained *p-value*. The family support variable is 0.000 with a GIS of 0.05. So, statistically, the family support variable significantly correlates with exclusive breastfeeding at the KIA Polyclinic of Royal Prima Hospital Medan in 2024. The results of this study are consistent with Oktalina's research (2016), which showed a significant relationship between family support and exclusive breastfeeding for mothers of KP-ASI members in the Working Area of Megaluh Health Center, Megaluh District, Jombang

Regency in 2015, with a *p-value* of 0.011 (Oktalina, Muniroh, and Adiningsih 2016). Family support is a form of motivation and assistance given to mothers to breastfeed their babies up to 6 months of age exclusively. This includes psychological support, preparation of balanced nutrition, and essential family functions such as meeting psychosocial needs, nurturing, giving love, and mutual support. The husband and other family members can actively provide emotional support and practical assistance to support the mother in breastfeeding. Family support falls within the broader concept of social support, which includes material, emotional, and informational assistance that affects an individual's well-being. This social support involves essential people in an individual's life, such as family, friends, companions, co-workers, and loved ones, to help individuals in need feel supported, valued, and loved.

CONCLUSION

Based on the results of research conducted in Labuan Regency, especially at the KIA Polyclinic of Royal Prima Medan Hospital in 2024, it can be concluded that there is a significant relationship between several variables and exclusive breastfeeding. The variables Age, Education Level, Employment Status, Knowledge, Attitudes, and Family Support have a *p-value* of ≤ 0.05 with a significance level of 0.05. This shows that these factors play an essential role in exclusive breastfeeding. Multivariate analysis also revealed that the knowledge variable had the highest Odds Ratio (OR) of 4.149. This indicates that the higher a mother's level of knowledge about the benefits of exclusive breastfeeding, the more her chances of exclusive breastfeeding of her baby increase by 4,149 times. Thus, it can be concluded that maternal knowledge plays a significant role in exclusive breastfeeding. Efforts to increase maternal knowledge about the benefits of exclusive breastfeeding can be an effective strategy in improving the coverage of exclusive breastfeeding in the community. Family support is also an essential factor in supporting the practice of exclusive breastfeeding, as support from the family can motivate mothers to carry out the practice better.

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ANALYSIS OF EYE PROSTHETICS SERVICE IN THE REPUBLIC OF UZBEKISTAN

Yusupov A.F., Khodjaev D.Kh.

Republican Specialized Scientific-Practical Medical Center of Eye Microsurgery

INTRODUCTION

Artificial eyes appeared many years before the new era. Egyptians, Greeks and Romans first inserted them into statues, mummies, and then began to use them in patients. The materials for prostheses at that time were stone, wood, ivory, gold, silver and precious stones. But these materials were very heavy and gave way to glass [6].

The present history of eye prostheses begins from the time of the French physician Ambroise Paré (1510-1590), who gives a description of the prosthesis, with appropriate drawings attached.

At the end of the XVI century, two types of artificial eyes were used: enamel-covered gold and silver shells similar to half of a walnut shell, on the outer surface of which an iris with a pupil was drawn, and glass prostheses.

In the middle of the XVII century, the production of artificial eyes were engaged in Venice, where there was a highly developed glass and glassblowing industry. But later this art is transferred to France, where the manufacture of prostheses reached such perfection that they were famous throughout the world.

At the end of the XVIII century in Paris appeared many specialists-prosthetists. However, at that time the use of prostheses was limited due to their high cost.

Since the middle of the XIX century and in Germany began production of eye prostheses. In the second half of the XIX century, German prostheses became widely known and universally recognized.

The firm "Muller" at the suggestion of G. Snellen in 1898 began to make double-walled prostheses. When wearing such a prosthesis, no discharge accumulated in the conjunctival cavity.

In the times of the Soviet Union the eye prosthetics service was controlled by two departments. The first was the Ministry of Health of the USSR - All-Union Scientific and Methodological Center for Eye Prosthetics at the Moscow Helmholtz Eye Diseases Research Institute. Helmholtz - 15 laboratories of individual eye prosthetics (LIGP) and more than 160 offices of eye prosthetics (OAP) and points of selection of eye prostheses.

The second - Ministry of Instrumentation, Automation and Control Systems - Moscow factory of eye prostheses with a branch in Odessa.

In the Republic of Uzbekistan until 1990s the main method of prosthetics was the selection of standard eye prostheses. If there were indications, the patient was sent for individual eye prosthetics or plastic surgery in the orbital area to Moscow or Odessa at the expense of the state. Since individual eye prosthetics is more effective, much attention was paid to the development of a network of laboratories for individual eye prosthetics (LIGP). But it concerned only regional centers of RSFSR.

After the collapse of the USSR on the territory of the Republic of Uzbekistan the quality of the eye prosthetics service (EPS) significantly decreased. Since the enterprises producing standard or individual eye prostheses were located on the territory of the Russian Federation, patients from Uzbekistan had to travel abroad at their own expense.

In the territory of the Republic of Uzbekistan, during the next few years, it was possible to provide patients with eye prostheses on the basis of remnants of standard sets. But since they were not replenished, the quality of prosthetics was very low. But their stocks soon ran out, too, and the situation became catastrophic.

Due to the absence of registered synthetic liners on the territory of Uzbekistan or the lack of doctors' skill in working with autotissue, the question of the necessity to form a musculoskeletal residual limb (MSL) was not discussed. After enucleation of the eyeball these patients were no longer of interest to the ophthalmologist.

According to the data of the State Statistics Committee of the Republic of Uzbekistan, the number of permanent population of Uzbekistan in 2023 amounted to 35.6 million people. The intensive indicator of anophthalmos detection among the population is 22.3 persons per 10,000 people (Gundorova R.A. Vestnik Ophthalmologii. 2003). According to this indicator, the number of patients in need of eye prosthetics in the Republic of Uzbekistan should be 78,320 people. Annually their number increases by more than 0.5 thousand. At the same time, there is no systematic treatment, monitoring and accounting of these patients.



The situation is different in Europe and the USA, where after removal of an eyeball a patient is referred to an ophthalmologist. Ophthalmologist is a specialist, as a rule, without medical education, who has his own office, where privately makes an eye prosthesis, makes a calculation of labor costs and materials used. With this conclusion, the patient applies to the social security authorities, where all financial costs are reimbursed. Subsequently, a patient with anophthalmos contacts an ophthalmologist only if the ophthalmologist discovers any problems associated with pronounced cosmetic defects.

A close relationship between ophthalmologists and manufacturers of eye prostheses helps to ensure optimal conditions for preventing the development of various complications in the early and distant periods after eye removal, since the formation of the conjunctival cavity and the musculoskeletal stump must meet certain requirements.

Due to the improvement of technological processes for the production of eye prostheses, nowadays the most common is the production of prostheses from polymethylmethacrylate.

Eye prosthesis has not only cosmetic, but also therapeutic and preventive value, protecting the eye cavity from the irritating effect of environmental factors. Prolonged absence of the prosthesis in the conjunctival cavity causes its shrinkage and chronic inflammatory process, and the absence of the prosthesis in children or its irregular replacement leads to stunted growth of the eye cavity and the corresponding half of the face [1,3,5].

To achieve a good cosmetic result, it is necessary to form a voluminous and well-movable residual limb. This can be achieved by insertion of an implant. Enucleation without implantation of an inlay leads to the insufficiency of the supporting-moving residual limb and a large volume of the conjunctival cavity, which requires the use of large, heavy eye prostheses during prosthetics, which do not lead to the elimination of the cosmetic defect, but, on the contrary, emphasize this defect.

The optimal type is individual eye prosthetics, when the prosthesis is made with careful consideration of the specific features of a particular patient [5].

Eye prostheses are of two types: glass and plastic. It is recommended to change a glass prosthesis once a year, a plastic prosthesis - after 2 years.

For disabled and privileged categories of patients eye prosthetics should be carried out at the expense of regional social insurance funds.

Eye Prosthetics Service:

Should provide assistance to patients with anophthalmic orbit and aims to improve the quality of their medical and social rehabilitation;

This system should consist of two parts:

1. The first is the provision of therapeutic and methodological assistance by a highly qualified specialist in ophthalmoplastic surgery
2. Second - provision of patients with standard or customized eye prostheses

The tasks of an ophthalmic plastic surgeon are:

1. Timely diagnosis of ophthalmopathy suggesting the need for enucleation of the eyeball.
2. To master all types of modern operations of eyeball removal (enucleation, evisceration, exenteration) and stump formation to replenish the volume of orbital tissue, as well as to ensure maximum mobility of the prosthesis.
3. Be able to identify pathologic conditions of the conjunctival cavity of the anophthalmic orbit that deteriorate the quality of eye prosthetics and eliminate them using modern surgical manipulations and grafting materials.
4. To be able to provide psychological assistance to patients who are going to undergo eyeball removal or patients with anophthalmic syndrome facing the problem of social adaptation.



Ophthalmologist Tasks

To be proficient in modern technologies of fabrication of eye prostheses made of acrylic or glass



To be able to identify frequently occurring pathological conditions of conjunctival cavity and orbital tissues, deteriorating the quality of eye prosthetics, for timely referral of the patient to the attending physician.



To be able to provide psychological assistance to patients with anophthalmic syndrome facing the problem of social adaptation.



There should be a close interaction between these two specialists for timely and quality solution of all problems arising in patients in the process of prosthetics and in the period of further wearing of the eye prosthesis

OBJECTIVES OF THIS STUDY

On the basis of studying own and foreign experience of organizing work with patients with anophthalmic orbit to determine the most effective system of eye prosthetic care

By the method of questionnaire distribution to specialized medical institutions of the Republic to find out the degree of their availability of necessary personnel and equipment for rendering assistance to patients with anophthalmic orbit.

MATERIALS AND METHODS

We developed a questionnaire with the questions determining the state of eye care and sent it to the heads of the branches of the Republican Specialized Scientific and Practical Medical Center for Eye Microsurgery (RSNPMCEM) and ophthalmology departments of multidisciplinary clinics.

The main issues were the following:

1. Does the medical institution have an ophthalmoplastic surgery department or a specialist in this field?
2. Is there an opportunity to provide eye prostheses to patients in need?
3. What types of operations related to surgical treatment of anophthalmic orbit are performed in the medical institution?

Statistical processing of data. Statistical processing of the studied patients' data was performed using Microsoft Office Excel 2019 (Microsoft Corp., USA) and STATISTICA 13 (StatSoft Inc., USA) software package. When comparing two independent samples with normal distribution of indicators, Student's criterion was used. Differences were accepted as statistically significant at $p < 0.05$.

RESULTS AND DISCUSSION

The following results were obtained from the questionnaire: A total of 22 letters were sent. All the letters were answered.

Analysis of the received responses showed that 15 (68%) of the 22 clinics were treating patients with anophthalmic orbit. In 7 (32%) clinics the work in this direction is not carried out.

Specialized departments work only in two (9%) medical institutions with availability of specialists of the corresponding profile.

In 13 clinics there are ophthalmic surgeons skilled in basic surgical manipulations. These are operations of enucleation, evisceration of the eyeball with or without formation of a musculoskeletal stump (MSK).

Reconstructive surgeries to eliminate defects of the anophthalmic orbit (delayed formation of the RCC, formation of a cavity for an eye prosthesis, correction of the shape of the conjunctival cavity of the anophthalmic orbit, elimination of scarring changes of the cavity and eyelids) are performed in RSNPMCMG.

Of the surveyed clinics, only the LIGP functions at the RSNPMCMH (Tashkent city). In addition, there are two private LIGPs (Tashkent city).

Prostheses are made of medical acrylic.

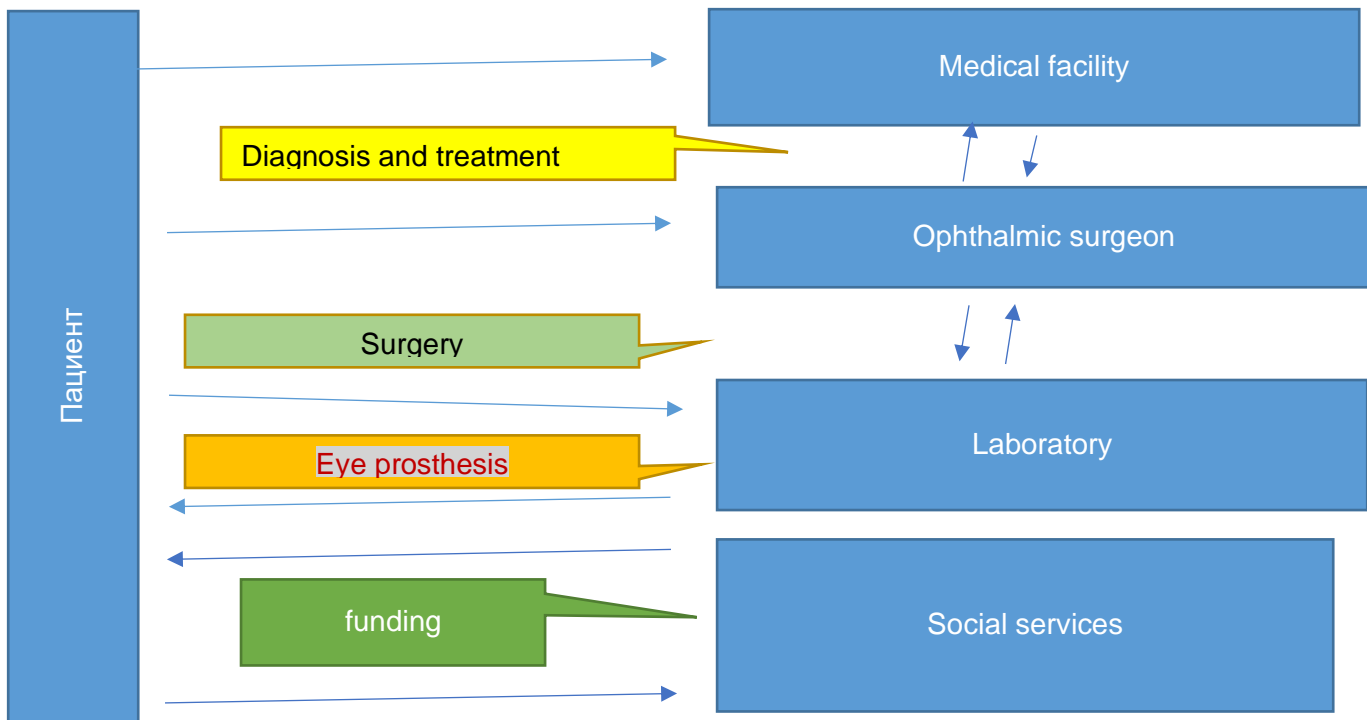
Prosthetics are provided at the expense of patients' own funds and funds provided by sponsors. Funding through social services is not provided.

Work is under way at the Republican Specialized Scientific and Practical Medical Centre for Eye Microsurgery (Tashkent) to organize a course on ophthalmoplastic surgery, which will include materials on conservative and surgical treatment of patients with anophthalmic syndrome.

Close cooperation has been established with the Department of Ophthalmology of the Center for Development of Professional Qualifications of Medical Workers. Cadets are provided with up-to-date information on surgical and conservative treatment of patients with anophthalmic syndrome based on the data of modern literature and our own developments.

Each regional ophthalmology clinic should have a specialized department or specialists in ophthalmoplastic surgery. Create an opportunity for an ophthalmologist to specialize in ophthalmoplastic surgery through on-the-job training. Ophthalmoplastic surgery specialists should be organized into regional societies and are an important platform for specialist training.

Ocularists should be trained in specialized educational institutions where they are given knowledge of orbital anatomy, sculpture and drawing



CONCLUSIONS

It is necessary to develop educational and methodological materials for training ophthalmologists in methods of surgical and conservative treatment of patients with anophthalmic orbit.

To oblige the management of specialized ophthalmological clinics to have at least one ophthalmologist in the specialization of ophthalmoplastic surgery and to train one member of the junior medical staff in the methods of care of patients with eye prosthesis

Development of teaching aids for patients with anophthalmic syndrome in the Uzbek language.

Establishment of close interaction between ophthalmologist and ocularist for the benefit of an anophthalmic patient according to the following scheme

Medical Efficiency. Due to staged prosthetics, dynamic examinations of ophthalmologists correcting the size and shape of eye prostheses, good cosmetic results of prosthetics are achieved and the terms of medical and social rehabilitation of patients are reduced [5].

Social Efficiency. Social efficiency of the proposed system of eye prosthetic care for patients with anophthalmic syndrome is that it allows to improve the quality of eye prosthetics, which makes it possible to improve the quality of its psychological, and hence social adaptation in society.

Economic Efficiency. The economic efficiency of the proposed measures for the organization of eye prosthetic care for the patient is that by increasing the level of self-esteem of the patient with anophthalmic syndrome we increase the probability of his quicker employment.

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BEYOND LIKES AND SHARES: HOW SOCIAL MEDIA SHAPES VOCABULARY ACQUISITION

Pauline Joy Gelacio Tardaguila
Nueva Ecija University of Science and Technology

Article DOI: <https://doi.org/10.36713/epra16106>
DOI No: 10.36713/epra16106

ABSTRACT

Social media has become a prevalent tool for teaching and learning, enabling students to engage in self-directed learning, collaborative discussions, and feedback exchange to enhance their grammar and writing skills. This study investigates the influence of social media on vocabulary development and motivation for English language learning among second-year English major students at Nueva Ecija University of Science and Technology's College of Education. It employs a Likert scale questionnaire to explore both the positive and negative influences of social media platforms on language learning. The study's findings aim to illuminate how social media can contribute to vocabulary acquisition and foster interest in English language learning.

KEYWORDS: *Social Media, Vocabulary Development, English Language Learning, Motivation*

INTRODUCTION

The digital landscape has been irrevocably transformed by the rise of social media platforms. These platforms, initially designed for social connection, have become an inseparable part of student life, influencing not only their social interactions but also their academic pursuits. In the realm of language learning, social media presents a fascinating case study – a double-edged sword offering opportunities for vocabulary acquisition and authentic language exposure, while simultaneously posing challenges regarding grammar and formal writing skills.

This research delves into the multifaceted influence of social media on student vocabulary and language learning. We explore how social media's community-driven nature fosters substantive interactions beyond the classroom, promoting the use of authentic language as documented by Al-Jarrah et al. (2019). We examine how platforms like Facebook, YouTube, and Twitter provide a wealth of up-to-date content, immersing students in a dynamic learning environment, as evidenced by Al-Rahmi & Othman (2013). Additionally, we investigate how this global connectivity facilitates interaction with native speakers, potentially enhancing cultural understanding and providing opportunities for real-world language practice, as suggested by Bicen, Sadikoglu, & Sadikoglu (2015).

However, we recognize the potential pitfalls associated with the informality prevalent in online communication. This informality, characterized by contractions and abbreviations, can negatively impact students' writing skills, as studies by Abbasova (2016) and Kasuma (2017) suggest. Swan (2017) further highlights the concern that exposure to informal language might lead students

to unintentionally incorporate it into formal writing. This underscores the importance of fostering critical awareness among students regarding the appropriate use of language in different contexts.

Therefore, this research aims to navigate this complex terrain. We seek to understand how social media can be harnessed as a valuable tool for vocabulary building, cultural immersion, and exposure to authentic language. Simultaneously, we will explore strategies to mitigate the potential negative impacts on formal writing skills, emphasizing the need for a balanced approach that integrates traditional classroom instruction with the power of social media.

Furthermore, this research will extend the conversation by considering the impact of specific social media platforms. Different platforms cater to distinct communication styles, and investigating how platforms like Instagram or TikTok, with their focus on visual content, influence language learning could provide valuable insights. Additionally, we will explore the role of educators in the social media learning space. Research on integrating social media platforms effectively into lesson plans and guiding students toward responsible and purposeful use is crucial.

By acknowledging both the benefits and drawbacks of social media, this research aspires to contribute to a comprehensive understanding of its influence on language learning. Our findings will inform educators and students alike, empowering them to leverage the potential of social media to enhance vocabulary acquisition and language learning while mitigating its negative effects on formal language skills.



Statement of the Problem

The widespread use of social media platforms has sparked debate about their impact on language learning. While some argue social media fosters vocabulary acquisition and exposure to authentic language, others express concern about its potential to negatively affect formal writing skills due to informality. This research investigates the specific influence of social media on the vocabulary and language learning of second-year English major students at Nueva Ecija University of Science and Technology (NEUST).

This research will answer the following questions:

1. To what extent does social media use influence the vocabulary development of second-year English major students at NEUST?
2. In what ways does social media usage contribute to the language learning experience of these students?
3. What percentage of second-year English major students at NEUST utilize social media platforms as a tool for language learning?
4. How effective are different social media platforms as tools for language learning among second-year English major students at NEUST?

LITERATURE REVIEW

The ever-growing presence of social media platforms has sparked a critical discussion regarding their impact on language learning. While some argue social media fosters vocabulary acquisition and exposure to authentic language, others express concerns about its potential to negatively affect formal writing skills due to informality. This research delves into the multifaceted influence of social media on the vocabulary development and language learning experiences of second-year English major students at Nueva Ecija University of Science and Technology (NEUST).

Social Media as a Double-Edged Sword

Social media platforms offer unique affordances for language learning. Their community-driven nature facilitates meaningful interactions beyond the classroom walls, promoting exposure to authentic language used by native speakers (Al-Jarrah et al., 2019). Studies suggest social media can be a valuable tool, providing access to a wealth of up-to-date content (Al-Rahmi & Othman, 2013) and facilitating interaction with native speakers, potentially enhancing cultural understanding, and providing opportunities for real-world language practice (Bicen, Sadikoglu, & Sadikoglu, 2015).

However, the informal communication style prevalent on social media presents challenges. Exposure to contractions, abbreviations, and slang may negatively impact students' formal writing skills (Abbasova, 2016; Kasuma, 2017). Swan (2017) highlights concerns that students may unintentionally incorporate informal language into formal writing due to frequent exposure. This underscores the importance of fostering critical awareness among students regarding the appropriate use of language in different contexts (Boonkongsan, 2012).

Vocabulary Development and Social Media

Research suggests social media can be effective in vocabulary development. Khan et al. (2016) found social media to play a significant role in enhancing English as a Foreign Language (EFL) learners' vocabulary at the university level. Learners benefit from exposure to a variety of vocabulary used in academic, business, and technical texts on social media platforms (Khan et al., 2016). Additionally, repeated exposure to new words through interaction and reading on social media can contribute to incidental vocabulary learning (Kasuma, 2017). However, it is crucial to acknowledge potential limitations. Learners may encounter inaccurate forms of language on social media, highlighting the need for educators to guide students toward reliable sources and promote critical evaluation skills (Kabilan et al. as cited in Kasuma, 2017).

Platform-Specific Learning Strategies

The effectiveness of social media for language learning can vary depending on the specific platforms used. While platforms like Facebook and YouTube offer exposure to written and spoken language, platforms like Instagram with a focus on visual content might require different learning strategies. Further research is needed to explore how the affordances of various social media platforms influence language acquisition processes (Balakrishnan & Lay, 2016). For instance, investigating how learners engage with visual content on platforms like Instagram and how educators can leverage these platforms to promote vocabulary development and language learning would be valuable.

The Role of Educators in the Social Media Learning Space

Integrating social media effectively into language learning requires careful consideration. Educators play a crucial role in guiding students towards responsible and purposeful use of social media platforms. Research on effective strategies for incorporating social media into lesson plans and promoting critical language awareness can be beneficial (Boonkongsan, 2012). Studies exploring how educators can guide students in navigating the informal language environment of social media while using it to enhance vocabulary development and language learning are warranted.

METHODOLOGY

This study employed a quantitative approach to investigate the influence of social media on the vocabulary and language learning of English major students. A survey research design was chosen due to its ability to collect data from a large sample of participants, allowing for the potential generalizability of the findings to a broader population (Mertler, 2018).

Sample and Sampling

The study focused on a sample of 50 English major students enrolled at Nueva Ecija University of Science and Technology. Purposive sampling was utilized, where participants were selected based on their specific characteristics relevant to the research question – in this case, being English majors (Creswell & Creswell, 2018).



Instrument and Data Collection

A self-administered questionnaire was developed using Google Forms to collect data on students' perceptions and experiences regarding social media's influence on their vocabulary and language learning. The questionnaire consisted of three main sections:

1. Demographic Information: This section gathered basic information about the participants.
2. Social Media and Vocabulary Development: This section explored students' perspectives on how social media impacts their vocabulary acquisition through a series of questions.
3. Social Media and Language Learning: This section investigated how students perceive social media's influence on their overall language learning experience.

Both sections 2 and 3 utilized a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) to measure student responses.

The use of a questionnaire aligns with a deductive approach to research, where existing theories about social media and language learning are tested through data collection (Beiske, 2002; Winters, Winters, & Amedee, 2010). The structured format of the questionnaire facilitates the collection of reliable and quantifiable data for statistical analysis.

Formula:

$$\alpha = \frac{K}{K-1} \left(1 - \frac{\sum_{i=1}^K \sigma_{Y_i}^2}{\sigma_X^2} \right)$$

RESULTS

This chapter presents the findings from the quantitative study investigating the influence of social media on the vocabulary and language learning of English major students at Nueva Ecija University of Science and Technology (NEUST). Data was collected through a self-administered questionnaire distributed to a sample of 50 students. The questionnaire consisted of two sections:

- a. Social Media and Vocabulary Development: This section explored students' perceptions of how social media impacts their vocabulary acquisition.
- b. Social Media and Language Learning: This section investigated how students perceive social media's influence on their overall language learning experience.

Both sections utilized a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Quantitative analysis was conducted on the collected data. To enhance clarity and facilitate comprehension, the results are presented in both a textual summary and through the use of graphical representations.

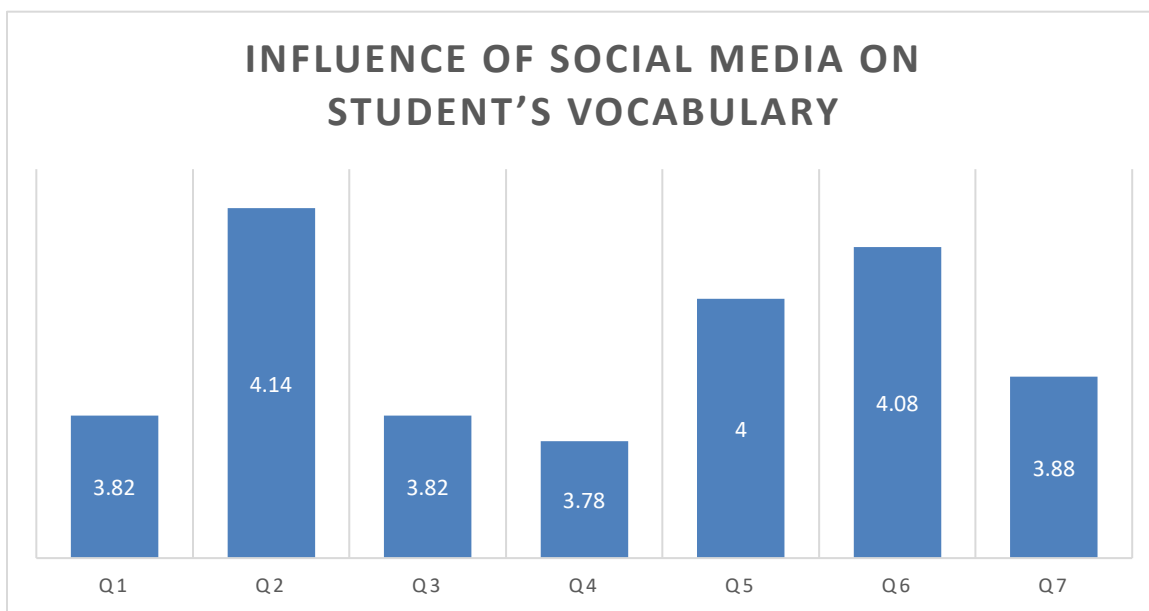


Figure 1: Mean Scores for Influence of Social Media on Student's Vocabulary

The findings related to social media's influence on vocabulary development are encouraging. The highest mean score (4.8) was obtained for question 6: "Social media helps me to understand the meaning of unfamiliar words and words that are difficult to understand." This suggests a strong agreement among students that social media can be a valuable tool for comprehension and vocabulary acquisition.

Similarly, question 2: "I use social media to improve my knowledge about new terminologies or vocabulary words in English," yielded a high mean score of 4.14 (agree), indicating that students actively utilize social media platforms for vocabulary learning. Furthermore, question 5: "Social media helps to broaden my vocabulary," received a mean score of 4.0



(agree), supporting the notion that social media exposure can contribute to vocabulary expansion.

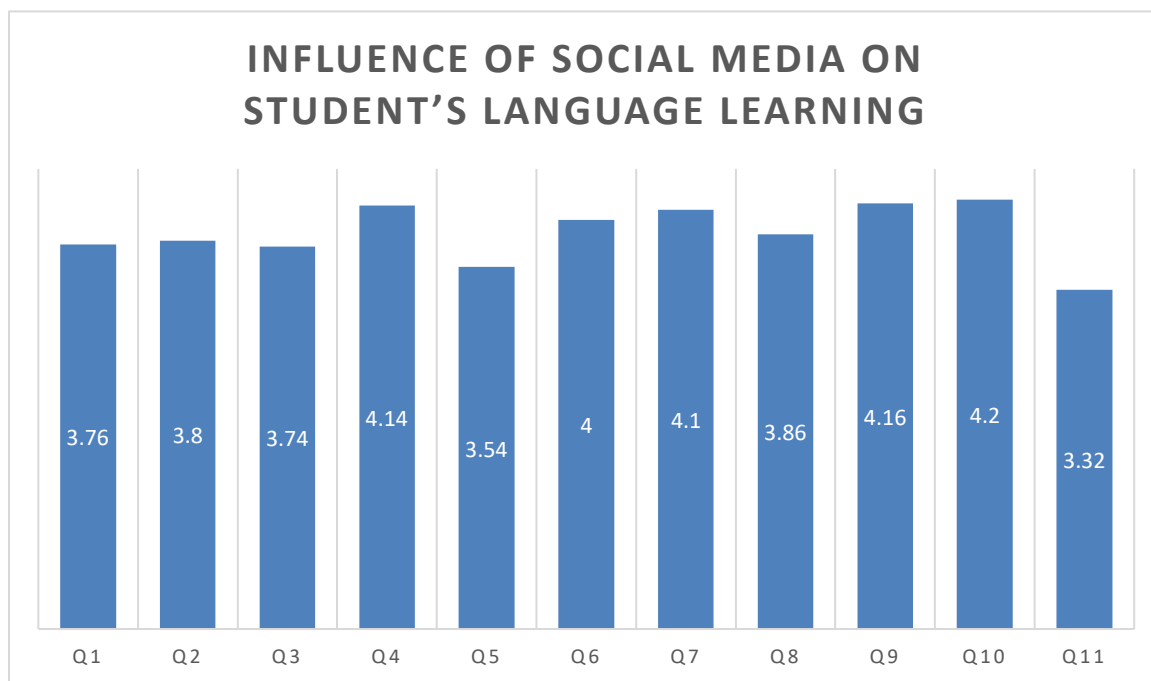


Figure 2: Mean Score for Influence of Social Media on Student's Language Learning

Figure 2 presents the mean scores for student responses regarding the influence of social media on their language learning experiences. The scores range from 1 (strongly disagree) to 5 (strongly agree). The highest mean score ($M = 4.2$) was obtained for question 10: "I am learning a lot when I watch some techniques on enhancing my use of grammar." This suggests a strong agreement among students that watching social media content focused on grammar techniques is beneficial for their learning.

Question 9: "I follow the pages and accounts of influencers promoting language learning," yielded a mean score of 4.16, indicating agreement with the statement. Similarly, questions 4: "I am learning a lot when I see posts about grammar," and 7: "I followed people on TikTok that has grammar and language learning contents," both received mean scores around 4.1, falling within the "agree" range.

DISCUSSION

The survey results obtained from 50 English major students at Nueva Ecija University of Science and Technology (NEUST) provide support for the initial hypothesis. The findings reveal a significant influence of social media on both vocabulary development and language learning experiences among the participants. These results suggest that social media platforms can be valuable tools for learners seeking to enhance their language skills.

Furthermore, the study's findings align with existing research in this area. For instance, Abbasova (2016) highlights how social

media interaction contributes to improvements in learners' vocabulary and literacy skills by providing opportunities for engaging with the target language in a dynamic context. Similarly, the current study demonstrates that a majority of students agreed that social media has a positive influence on their vocabulary and language learning. This suggests that the effectiveness of social media extends beyond traditional teaching and learning methodologies, offering benefits for independent vocabulary acquisition and language development.

CONCLUSION AND RECOMMENDATION

This study investigated the influence of social media on the vocabulary and language learning experiences of English major students. The findings, aligned with previous research (e.g., Abbasova, 2016), demonstrate that social media can be a valuable tool for language development. A significant portion of the participants (50 English majors at NEUST) reported that social media positively impacts their vocabulary acquisition and language learning.

However, it is crucial to acknowledge the potential drawbacks associated with excessive social media use. These include cyberbullying, decreased family time, and physical health concerns like body fatigue. Therefore, promoting a "think before you click" approach and encouraging responsible social media use is essential.

The current pandemic situation (COVID-19) highlights the potential of social media for bridging geographical distances and



facilitating continued learning. The results of this study suggest that incorporating social media platforms strategically can enhance vocabulary development and language learning experiences, particularly in remote learning environments.

Recommendations

Based on the findings, this study recommends the following:
Social Media Integration for Language Learning: Educators and institutions can explore strategies to integrate social media platforms effectively into language learning curricula, maximizing the benefits for vocabulary acquisition and language development.

Responsible Social Media Use: Educational programs promoting responsible social media use can be implemented to equip students with the necessary skills to navigate social media platforms safely and productively.

Balance and Breaks: Strategies to encourage healthy social media habits should be promoted, including taking breaks to prevent physical strain and maintaining a healthy balance between social media use and other aspects of life.

By implementing these recommendations, educators and learners can leverage the affordances of social media to enhance language learning experiences while mitigating potential negative consequences.

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ISSUES OF ACTING IN NATIONAL CINEMA ART: STYLE AND INTERPRETATION

Ithom Sadikov

Associate Professor of the Department of "Art of Variety and Public Performances" of the State Institute of Arts and Culture of Uzbekistan

ABSTRACT

This article focuses on specific issues of acting performance in national film art. Acting interpretations are expressed on the example of films.

KEYWORDS: *film, actor, director, performance, interpretation, festival, nomination, plot, dialogue, monologue.*

The beginning of Uzbek cinema goes back to the 20s of the 20th century. It is known from history that the art of film first appeared in silent form. The process of showing the first films in our country started in 1925. From this period, as we mentioned above, the Uzbek cinema went through different development paths. At first, film experts came from Russia, and later, due to the attraction of national and local talents to film, film experts began to come from our country. We can highlight Kamil Yormatov, Yoldosh A'zamov, Nabi G'aniev, their followers Shuhrat Abbasov, Mels Abzalov, Damir Salimov and others as the first swallows of Uzbek cinema. They are the masters of Uzbek cinema, their films are filled with acting, research, and mentor-disciple traditions. It is safe to say that they made an incomparable contribution to the formation of the Uzbek acting school. For example, in 1967, director Yoldosh A'zamov's film "The Past Days" appeared as a unique phenomenon in Uzbek film art in the way of referring to the elements of nationalism. Despite the fact that the events of the work were shortened and the appearance and character of the characters were shown in a slightly different way, the film was able to express such qualities as pure love, Uzbek language, andishsa, loyalty in the bright colors of the screen. It would not be wrong to say that the role of Kumush, performed by Gulchehra Jamilova, became the "visiting card" of the actress for the rest of her life. From the beginning of the actress's steps to Otabek, the respect for her mother-in-law and father-in-law is depicted, imbued with modesty. In the dialogues, the audience perceives the role performed by the actress as a real event. If we recall the conversation of Haji Yusufbek with his son Otabek, "Son, have you heard yet, we have done something for you, Otabek: what intelligent people do to their sons is certainly not inappropriate." dialogue is beautifully depicted in the works of Abbas Bakirov and Maryam Yaqubovalar. At the same time, it is expressed with extreme humility. In this image, the actor's facial expressions, looks, and low voice show professional acting skills. The actors are chosen with taste, and the approach to their roles, the research is observed in the performance of each actor.

Although the idea of the film is the tragedy of love, the conflict between the dream of the parents and the child's own love, in

the second film, the dream of independence, patriotism and courage, feelings of nationalism are also depicted in the background of the events.

Uzbek film art, which has a century-long history, has gained a colorful and attractive expression in terms of its appearance and scope of topics. The demand for cinematography in films has increased. The number of talented filmmakers - directors, cinematographers, and actors has expanded. The new creative products being created have developed somewhat in terms of content and level.

Many films such as Shuhrat Abbasov's "You are not an orphan" and "Tashkent - City of Bread", Yoldosh A'zamov's "The Past Days", Damir Salimov's "Shum bola" and Mels Abzalov's "Duel under the plane tree" pass before our eyes. Because the roles performed by artists who contributed to the development of a unique school of acting in Uzbek cinema are imprinted in our memory. In the process of making a film, an actor becomes an actor only if he is able to play the role with all his being, following the instructions of the director like a child. The main thing for an actor is to know the way, to live in the role, to improvise if necessary. Professor Shuhrat Abbasov, an artist, told the students about this: "An actor should always imagine what the director has created, be able to see it and strive for it."

The plot of the film "You are not an orphan" was shot on the basis of real facts and brought to the level of a high art work with literary and artistic colors. The fact that the Mahkamov family from Tashkent took in the children evacuated from the war zones, raised them as their own children, and "eat one raisin into forty" was a clear manifestation of the human virtues of our nation. During the war years in our country, hundreds and thousands of families like Mahkamovs expressed the highest examples of humanistic ideas due to their actions and courage. Especially Lutfikhanim Sarimsokova's mother's eyes and facial expressions of the actress reach the audience's heart. The role of Mother performed by the actress is distinguished by the fact that the patience, perseverance, hard work, childishness, family care of Uzbek mothers are expressed in impressive scenes.



In the film "Tashkent - the city of bread" we will see the only Uzbek actor Hikmat Latipov in the role of the gardener Father in the film about the Second World War. His inner monologue is reflected in his facial expressions in the close-up. The state of the actor is revealed without words. An actor (future) watching this film carefully watches each plot and learns the secrets of acting.

"Homeland", "Eighteenth square", "Paradise is the rule", "O'tov", "Old man and granddaughter", "Deceived woman", "Paris", "Traitor", "Illhaq", "Ibrat", "Hot bread", "Colorless Dreams", "Women's Destiny" and other films, the performance of the actors improved. At the same time, these films, which appeared on the big screen, were shown to full capacity, and broke the record in terms of the number of viewers in the history of national cinema. He participated in film festivals of many countries and won prizes. Many film projects were even signed. This means that in the world of Uzbek cinema, acting issues have further developed. Studying and applying the features of the foreign experimental school to the Uzbek film field did not leave the creators of every film industry indifferent.

In the movie "Deceived Woman", it is revealed in touching events that a woman unknowingly joins a group of extremists who have disguised themselves as Islam, leaving her family and children in the name of jihad and going to foreign countries, but when her heart opens and she sees the true faces of their leaders, it is too late. The actress plays the character of Rayhon Ulasenova to such an extent that she makes the audience hate her in every shot. It is interesting that he paid attention to every detail in his convincing performance of the role. Due to the events of the film, the behavior of the characters, the images and the findings of the director and the actor, the work gained great popularity among the people. We discovered actress Rayhon Ulasenova as a viewer. His talent was evident through this film.

Ayub Shahobiddinov's film "O'tov" (2007) contains deep ideological content. The main character of the film, Ubaidullah, is "repentant" of the regime of the former Soviet Union. Tuzum deprives him first of his parents and then of his wife. What he found in life will remain with his only son. That is why he goes out to the mountains, away from people and society, and grows grass there. And he begins to live in the grass. He tries to protect his only son from the regime that he has created. The only son, and later his wife and younger her daughter becomes the meaning of her life.

The boy strives to see the world, to keep up with the times like his peers. The information flows of the new age begin to attract him. And he urges him to go to military service more than his father. The mind of Asov, a good-natured, inquisitive, cave boy, was poisoned by military hardships and the Afghan war, and became a drug addict. Now Ubaydullah is trying to wash away the "traces" left by the infamous regime on his only son.

Ubaydullah, who lives in a mountain and stone, far from people, looks like a slob and a slob at first glance, but in reality, he is an intellectual and spiritually rich person. In the film, the acting performance of Nozim Tolakhojaev was the leader.

Despite the fact that there are many middle-aged actors, Ayub Shahobiddinov invited Nozim Tolakhojaev to play the main character of the film, Ubaydulla, which ensured the successful release of the film. N. Tolakhojaev played many unique roles in Uzbek cinema. In the film, the fate of people who suffered from the tyranny of the era in the last century, and therefore fell into despair, is shown through the image of Ubaidullah. At first glance, Ubaydullah seems to be a man who does not fit the bill in some ways. Indeed, one episode shown during the film (taking a tailcoat out of a trunk and putting it on) proves that he is a man of art.

His son Javahir (A. Rametov) portrays his character as simple, humble, eager to study. It is not difficult to find out from the traces of his past stored in his chest, and from the preservation of the frag that belongs to him. The ending of the film has an artistic visual solution in an individual way. That is, Ubaydullah answers the questions of his daughter with his sweet language, the girl simply asks when independence will come. And Ubaidullah replied that there was little left as he continued his work. And in the image, the sun is smiling from the top of the distant mountain trail. The film "O'tov" was recognized for its noble and soul-stirring idea and purpose. Through this film, Nozim Tolakhojaev's acting skills came to the attention of film experts as well as fans. The film was awarded with the "Best Actor" nomination for the character of Ubaydulla, created by the talented film actor Nozim Tolakhojaev in the film "O'tov" at the prestigious "Kinoshok-2007" international film festival held in Russia.

If the viewer does not like the hero of the film, does not find similar aspects in him, it is difficult for the film to survive. The artist's talent is manifested in the fact that he reveals his purpose through the film and can enter the audience's heart. Director Dilmurod Masaidov's film "The Destiny of a Woman" is one of the most noteworthy films of 2022, but the events are widely observed on the topic of human trafficking, religious extremism, terrorism, which is one of the global problems of the whole world. This film, dedicated to "Operation Mercy", is presented through a woman's destiny. Destinies and fates are inextricably linked. The fate and fate of a young Uzbek woman, performed by Rano Shodieva, is depicted in impressive scenes. Her stay in Syria, the death of her husband, the loss of her child, and the death of people in front of her eyes in minefields are distinguished by the fact that the actress Sojida's performance is very believable. Through the film, as a viewer, actress Rano Shodieva will learn some of the acting secrets hidden in her through this performance of Sojida.

It is no exaggeration to say that the feature film "Ilhaq" dedicated to the 75th anniversary of the Victory on the initiative of the President of the Republic of Uzbekistan Sh. Mirziyoyev, shot by the national agency "Uzbekkino" on the basis of the state order, is considered the best feature film of the last fifteen years. We have heard many times in the books and in the movies that the phrase "Let the name of war be erased." Yes, war never lives up to its name. It's scary to even think about it. Many films have been made about the war, each with its own idea and style. In general, any film about war has not lost its relevance.



As for *Ilhaq* film, the basis and ideological importance of the picture is that it depicts the image of Mother who waited for *Ilhaq* until the end of her life for five children. Not only the mother, but also the halals of their spouses, who were waiting for five sons, even the words of Zulfia Aya: "You young people, touch the halals of their spouses when they come out."

Another achievement of the film is the positive resolution of the scene of the historical event of the construction of the Big Fergana canal in 45 days by the road. manifested when he was able to illuminate the image without interruption. The beginning of the war, one of the five boys going behind the front line, willingness to sacrifice their lives for the sake of their family and children, the bravery, bravery of the real Uzbek boys are highlighted in the image of the five boys. That every one of them should die valiantly in war; The eldest son Isakjan was brutally shot by the fascists in Belarus in front of his brother Vahobjan, and another son Akhmadjon saved the life of a girl belonging to the Ashiya nationality and blew himself up together with the fascists, and Muhammadjan returned to the war as a hero in one of the battles despite being wounded and the only man in the family. to be killed, and the younger son Yusufjon, despite not being young enough to have a family, went to the war as a volunteer and died under the rain of bombs, the sequence of events of the plot makes a person nervous.

The scriptwriters (J. Akhmedov, H. Toshkho'jaev) made extensive use of fictional images to make the film "*Ilhaq*" based on real life events interesting to the fans. For example, the image of Charikul (R. Qurbanov), who is mute and lame, is included. Although he did not bleed on the battlefields due to his disability, killing Mels, the son of Rais, who is more dangerous than any Nazi, is proof that he made a worthy contribution to the defense of the Motherland while standing behind the front.

In the film, the director's own sayings show that feelings of gratitude should be imprinted in memory every second for a person. The mother's family, torn apart by the brutal war, expresses its place in the neighborhood in very moving scenes. Mother Zulfiya (Dilorom Karimova) feeds all the children of the neighborhood with the milk of her family's one and only cow, and the rest is given to her granddaughter-in-laws... Each actor fulfills the task set before him fully and convincingly. Anyone who watches the film carefully will witness how much the war has affected the human destiny and the suffering it has caused. One can see with a deep sigh that the dreams of young men, besides women and children, are destroyed. The fact that the director searched for the goal he set for himself, searched and worked with the ensemble of actors and the whole team showed its reflection in every film and episode.

It is worth mentioning that in the 2021 "Golden Humo" film presentation, they won the nominations "Best directorial work", "Best female role", "Best costume designer", "Best film". This testifies to the film's achievement, success, high acting skills, and the creative team's pursuit of the goal.

Each film contributes to the development of the national film industry to a greater or lesser extent as a creative work with its

own plot, theme and scope. The first decade of our new century can be considered as a period of intense creative process for Uzbek cinematography. After all, in this creative process, the appearance of films on various topics, the increase in the number of films, by itself created competition among filmmakers. And the competition created the ground for the improvement of the level of movies, the creation of good and good movies. At the same time, significant changes are taking place in the national screen art itself. This is especially evident in recent screen works, when philosophical thoughts have increased, human soul has been explored more deeply, and artistic perception of life has become more colorful.

Uzbek filmmakers are entrusted with the great task of preserving and developing the best achievements of our national film art, bringing the artistic expression of the idea of national independence to the audience in an alternative form, combining national and universal values, and they have enough determination and skills for this.

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EVALUATION STUDIES EFFECTIVENESS OF PROFESSIONAL ACTIVITIES OF RESCUE DIVERS

Sh.E.Kurbanbayev¹, A.A.Mardonov²

¹Professor, Doctor of Technical Sciences Research Institute of Emergency Management and Emergency Situations of the Ministry of Emergency Situations of the Republic of Uzbekistan

²Independent applicant of the Academy of the Ministry of Emergency Situations of the Republic of Uzbekistan

ABSTRACT

The scientific paper presents the information obtained based on the results of research on the prevention of negative consequences of existing risks affecting the activities of rescue divers, and evaluating the effectiveness of their professional activities. As a result of the conducted research, proposals were made for a theoretical prognostic assessment of the effectiveness of rescue divers and improvement of methods to ensure their safety during their professional activities.

KEYWORDS: rescue diver, risk, health, working conditions, professional group, compressed air, mental state, negative factors.

It is known that the professional activities of rescue divers are carried out in extreme conditions that threaten their health and life. A number of important qualities necessary for activities in extreme conditions (emotional stability, physical fitness, flexibility, etc.) are important in determining and predicting the professional activities of rescue divers [1].

Factors directly related to the activities of rescue divers:

1. Vital capacity of the lungs – normally the vital capacity of the lungs is 3000-4500 ml³ [2].
2. State of physical fitness - the state of physical fitness of rescue divers is assessed according to standard criteria [3].
3. Blood pressure – the average blood pressure in adults is 120/80 mm Hg. Art. [4].
4. Water pressure - an absolute pressure of 0.1 MPa (1 kg/cm²) per 10 meters affects the human body [5].

In research work, by studying and influencing qualities, it was possible to assess the effectiveness of their professional activities and improve existing methods, that is, by conducting certain types of practical

training and theoretical research that rescue divers must have to carry out their activities.

At the initial stage of research, a series of experiments were periodically carried out on local natural and artificial reservoirs in order to assess the effectiveness of the work of rescue divers. At the same time, rescue divers were tested to perform 3 different types of tasks: swimming underwater with a breathing apparatus, carrying a load underwater and searching for an underwater object along a guide rope within a certain period of time. time [6]. Including,

Exercise 1: swimming underwater with breathing apparatus. With this method, the rescue diver first checks the breathing apparatus, puts on a half mask and begins to breathe. According to the instructions, the diver will have to swim 500 meters underwater. Execution time was calculated from the start of the command until arrival at the target. The test results are presented in Table 1 (Time: excellent - 20 minutes, good - 25 minutes, satisfactory - 30 minutes).

Table-1
Results performing underwater swimming exercises with a breathing apparatus.

Rescue diver	Age	With breathing apparatus swimming underwater (minutes)
B-C - №1	42	25
B-C - №2	28	18
B-C - №3	34	20
B-C - №4	33	19
B-C - №5	22	18
B-C - №6	24	19
B-C - №7	23	17
B-C - №8	29	21
B-C - №9	23	19
B-C - №10	24	25

Exercise 2: Carrying a load underwater. With this method, the rescue diver first checks the breathing apparatus and puts on a half mask and begin breathing. According to the instructions, the diver must transport a pre-prepared load weighing 10 kg under water over a

distance of 200 meters. Execution time is the time from the start of the instruction to the arrival of the target. The test results are presented in Table 2 (Time: excellent - 10 minutes, good - 12 minutes, satisfactory - 15 minutes).



Table-2

Results performing an exercise to carry a load underwater.

Rescue diver	Age	Carrying cargo underwater (Minutes)
B-C - №1	42	14
B-C - №2	28	9
B-C - №3	34	10
B-C - №4	33	10
B-C - №5	22	8
B-C - №6	24	7
B-C - №7	23	9
B-C - №8	29	12
B-C - №9	23	8
B-C - №10	24	14

Exercise 3: searching for an underwater object using a guided cable. First, the rescue diver checks the breathing apparatus and puts on a half mask and begins to breathe. According to the instructions, the water is lowered and the search for the previously placed object begins.

Completion time was calculated from the moment the instruction was received until the diver reached the surface of the water and left the appointed place. The test results are presented in Table 3 (Time: excellent - 30 minutes, good - 40 minutes, satisfactory - 50 minutes).

Table - 3

Results exercises to find an underwater object along the route.

Rescue diver	Age	Search for an underwater object along a directed cable (minutes)
B-C - №1	42	40
B-C - №2	28	28
B-C - №3	34	26
B-C - №4	33	30
B-C - №5	22	29
B-C - №6	24	28
B-C - №7	23	25
B-C - №8	29	32
B-C - №9	23	27
B-C - №10	24	35

All 3 different types of exercises were performed periodically during the classes. It was repeated every 15 days for 6 months, and during this period they were given tasks to perform additional loads to improve their physical performance and their performance indicators were recorded. Physical activity was carried out in two different conditions aquatic and anhydrous conditions.

As can be seen from the above, as a result of regular training with rescue divers, it was observed that training time was reduced to 5 minutes in proportion to their age, their mental and physical fitness increased, their skills and self-confidence increased.

By assessing the effectiveness of rescue divers, he creates opportunities for their effective and targeted use of them. Also in this study we can see the compatibility obtained as a result of practical exercises with the results obtained by performing theoretical calculations.

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APPLICATION OF NEW PEDAGOGICAL TECHNOLOGIES TO SOLVE DIDACTIC ISSUES

N. A. Nasirova

Candidate of Philological Sciences, Associate Professor of the Uzbek State University of World Languages

Применение новых педагогических технологий для решения вопросов дидактики

Н.А. Насырова

кандидат филологических наук, доцент Узбекского государственного университета мировых языков

Аннотация: Статья заключается в том, что в настоящее время создание новых форм организации учебного процесса, использование новых средств обучения, разработка новых методов и приемов открывает большие возможности для внедрения достижений науки и практики в новые технологии обучения. В условиях заметных социально-экономических преобразований от учащихся требуется высокий уровень умений реализовывать творческий потенциал и свои интеллектуальные возможности, формирование способности к саморазвитию и конкурентоспособность. В педагогике наблюдаются новые подходы и взгляды на организацию процесса обучения и воспитания. В настоящее время каждый педагог находится в поисках наиболее эффективного пути усовершенствования учебного процесса, усиления мотивации, повышения заинтересованности учеников и роста успеваемости учащихся.

Ключевые слова: языковая культура, технология обучения, профессионально ориентированная исследовательская работа, международный стандарт

В Постановлении « О мерах по дальнейшему развитию системы высшего образования» Президент РУз Ш. Мирзиёев отметил, что « в целях кардинального совершенствования системы высшего образования, коренного пересмотра содержания подготовки кадров в соответствии с приоритетными задачами социально-экономического развития страны, обеспечения необходимых условий для подготовки специалистов с высшим образованием на уровне международных стандартов необходимо важнейшими задачами дальнейшего совершенствования и комплексного развития системы высшего образования считать:

установление каждым высшим образовательным учреждением страны тесных перспективных партнерских отношений с ведущими профильными зарубежными научно-образовательными учреждениями, широкое внедрение в учебный процесс передовых педагогических технологий, учебных программ и учебно-методических материалов, основанных на международных образовательных стандартах, активное привлечение к научно-педагогической деятельности, проведению мастер-классов, курсов повышения квалификации высококвалифицированных преподавателей и ученых из зарубежных образовательных учреждений-партнеров, организацию на системной основе на их базе стажировки магистрантов, молодых преподавателей и научных кадров, переподготовки и повышения квалификации профессорско-преподавательских кадров отечественных высших образовательных учреждений;

формирование целевых параметров подготовки кадров с высшим образованием, оптимизацию направлений и специальностей обучения в высших образовательных учреждениях с учетом перспектив комплексного развития регионов и отраслей экономики, потребностей реализуемых территориальных и отраслевых программ;

дальнейшее совершенствование образовательного процесса, учебных планов и программ высшего образования на основе



широкого использования новейших педагогических технологий и методов обучения, качественное обновление и внедрение современных форм организации научно-образовательного процесса магистратуры;

создание и широкое внедрение в систему высшего образования учебных пособий нового поколения, обеспечение высших образовательных учреждений современной учебной, учебно-методической и научной литературой, в том числе на основе приобретения и перевода новейшей зарубежной литературы, регулярное обновление фондов информационно-ресурсных центров;

неуклонное повышение уровня и качества профессионального мастерства педагогических кадров, прохождение повышения квалификации, стажировки педагогических и научных сотрудников, обучение выпускников высших образовательных учреждений по программам PhD и магистратуры за рубежом, широкое привлечение в образовательный процесс высших образовательных учреждений и центров переподготовки и повышения квалификации высококвалифицированных зарубежных ученых, преподавателей и специалистов;

укрепление научного потенциала высших образовательных учреждений, дальнейшее развитие вузовской науки, усиление ее интеграции с академической наукой, повышение эффективности и результативности научно-исследовательской деятельности профессорско-преподавательского состава, вовлечение одаренной студенческой молодежи в занятия научной деятельностью;

оснащение высших образовательных учреждений средствами современных информационно-коммуникационных технологий, расширение доступа студентов, преподавателей и молодых исследователей к мировым образовательным ресурсам, электронным каталогам передовой научной литературы и базам данных»[1]

Важнейшей составляющей структуры личности обучаемых и средством реализации названных выше задач выступают язык, речь, а также способность к межличностному общению. Настоящий фактор вызывает необходимость эффективного формирования языковой культуры обучаемых как на родном, так и на неродном, русском языке, который, являясь одним из мировых языков, продолжает оставаться языком общения и профессиональной деятельности в полиэтнической среде не только в нашей республике, но и за ее пределами.

В условиях заметных социально-экономических преобразований от учащихся требуется высокий уровень умений реализовывать творческий потенциал и свои интеллектуальные возможности, формирование способности к саморазвитию и конкурентоспособность. Это требует особых подходов к организации учебного процесса, заставляет пересмотреть как содержание образования и обучения, так и технологии образовательного процесса. Создание новых форм организации учебного процесса, использование новых средств обучения, разработка новых методов и приемов открывает большие возможности для внедрения достижений науки и практики в новые технологии обучения. Технология обучения дисциплин предметной подготовки предполагает самостоятельное изучение литературы; программированное и проблемное обучение; анализ педагогических ситуаций; деловые игры – моделирование профессиональной деятельности в учебном процессе; в процессе прохождения учебных и производственных практик; организацию профессионально ориентированной исследовательской работы при выполнении курсовых и дипломных работ и др.

Обостряются все более противоречия между возрастающими потребностями и существующей практикой обучения студентов вуза, новыми тенденциями высшего образования, требованиями к процессу обучения согласно стандартам, учебным программам и неопределенностью выбора путей наиболее эффективного обучения. Все эти процессы требуют теоретического переосмысления и опытной проверки новых педагогических технологий, разработанных современной педагогической наукой. Разнообразие подходов в классификации технологий обусловлено их сложностью и многоаспектностью, поскольку технология – это и логика воспитательного процесса, осуществляемая в разных видах педагогической деятельности; это и мастерство, и совокупность приемов и способов обучения, обеспечивающих высокую эффективность учебно-воспитательного процесса. Общая установка педагогических технологий – решать дидактические проблемы на пути управления учебным процессом[2].

За прошедшие годы практический опыт преподавания русского языка в группах с русским языком обучения в образовательных учреждениях Узбекистана констатирует, что уровень языковой и коммуникативной компетенции обучаемых далеко не всегда соответствует высоким требованиям государственного образовательного стандарта. С нашей точки зрения для повышения качества преподавания русского языка должен приниматься во внимание тот факт, что состав обучаемых многонациональный (узбеки, таджики, русские, татары, уйгуры, казахи, каракалпаки, туркмены, корейцы и др.). По понятным причинам, не все обучаемые обладают надлежащей русской речевой средой. В связи с этим подход к обучению этих учащихся (в основном торкоязычных) должен быть несколько иным, чем учащихся, для которых русский язык является родным. Следовательно, в условиях проведения коренных реформ в сфере народного образования, освоение методики преподавания русского языка в образовательных учреждениях Узбекистана с обучением на данном языке при многонациональном составе учащихся является на современном этапе актуальной лингвометодической проблемой.



В результате педагогика накопила в своем арсенале достаточное число эффективных методик. Тем не менее, очевидны проблемы стабильности в обучении, а также достижения каждым учащимся высоких результатов. Поступательное развитие педагогики открывает большие возможности в поиске новых средств, форм и методов обучения и воспитания. В педагогике наблюдаются новые подходы и взгляды на организацию процесса обучения и воспитания. В настоящее время каждый педагог находится в поисках наиболее эффективного пути усовершенствования учебного процесса, усиления мотивации, повышения заинтересованности учеников и роста успеваемости учащихся. В связи с этим стремлением повышать качество обучения реализация методов предполагает связанную деятельность педагогов и учащихся, в которой учитываются оптимальное использование человеческого и технического потенциала.

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GENDER INCLUSION AND DEVELOPMENT OPPORTUNITIES FOR WOMEN IN CURRENT SCENARIOS

Husenasab Vanageri

Research Scholar, Department of Social work,
Karnatak University, Dharwad-580003, Karnataka.

ABSTRACT

This paper highlighted on gender inclusion and the development opportunities for women have taken center stage in the discourse on social progress. Defined by United Nations Women as the assurance of equal opportunities and participation for all genders in societal aspects, this study explores these themes in contemporary scenarios. Utilizing an exploratory research design, the study reviews secondary sources such as academic papers and scholarly articles to map the landscape of gender inclusion and the development avenues available for women. This methodology facilitates a deep understanding by leveraging existing knowledge and insights, aiming to present a comprehensive view of the progress, challenges, and future prospects in gender inclusion and women's development. The conclusion focuses on India, highlighting its constitutional, legal, and empowerment efforts across various sectors, while pointing out persisting challenges such as socio-economic disparities. It underscores the importance of empowering women and creating a more equitable society.

KEY WORDS: Gender Equality, Women's Empowerment, Inclusion, Opportunities

INTRODUCTION

In an era marked by calls for equality and inclusivity, the discourse on gender inclusion and the development opportunities for women has emerged as a cornerstone of contemporary social progress. Gender inclusion, as defined by United Nations Women (2021), refers to the practice of ensuring equal opportunities, access, and participation for individuals of all genders in various aspects of society. This concept encompasses recognizing and addressing the diverse needs, experiences, and contributions of individuals, regardless of their gender identity or expression. The ultimate goal of gender inclusion is to create an environment where everyone can thrive without prejudice, stereotypes, or barriers. In recent times, there has been a growing awareness of the importance of women's development in fostering societal progress. This development includes economic, social, political, and educational growth, all of which significantly contribute to overall progress. As stated by the International Labour Organization (ILO, 2021), empowering women and promoting gender equality can lead to increased productivity, income generation, and economic growth. Moreover, it can result in improved social well-being, stronger families and communities, as well as a more stable political environment. Despite these advancements, numerous challenges persist in achieving gender inclusion and providing development opportunities for women. These challenges manifest in various forms, including gender pay gaps, limited access to education and healthcare, and underrepresentation in decision-making positions. Addressing these obstacles is crucial for creating a more equitable and inclusive society that empowers women to reach their full potential and contribute significantly to societal progress. The journey toward true gender equality requires ongoing effort, leadership accountability, and a

collective commitment to fostering diversity and inclusion at all levels.

REVIEW OF LITERATURE

Fernandez, R. et.al (2021) this paper explores various dimensions and sources of gender inequality, presenting policies and best practices for addressing these issues. Highlighting that women comprise fifty percent of the global population, it argues that inclusive growth is unattainable without promoting gender equality. Despite advancements, gender disparities persist across life stages, adversely affecting women's health, education, and economic outcomes. The authors advocate for gender equality through legal reforms, policies ensuring equal access, and initiatives to challenge deep-rooted social norms, considering the implications of digitalization, climate change, and pandemics.

METHODOLOGY

This study employs an exploratory research design to delve into the topic of Gender Inclusion and Development Opportunities for Women in contemporary scenarios. By conducting a thorough review of secondary sources, including academic papers, previous research studies, and relevant scholarly articles, the research aims to map the current landscape of gender inclusion and opportunities available for women's development. This approach facilitates a comprehensive understanding by drawing on existing knowledge and insights within the field. The methodology is designed to identify, analyze, and synthesize the findings from various studies to offer a consolidated view of the progress, challenges, and prospects concerning gender inclusion and women's development in today's context.



CURRENT STATE OF GENDER INCLUSION

In India, the quest for gender inclusion presents a complex tapestry of significant progress entwined with persistent challenges. The nation has seen commendable advancements in women's rights and participation across various sectors, propelled by policy reforms, educational achievements, and vibrant social movements aimed at fostering gender equality. Such efforts are gradually yielding results, especially in enhancing female education and healthcare. Nonetheless, these benefits are not uniformly experienced across the country, with socio-economic, cultural, and political barriers still obstructing gender parity, especially within rural and marginalized communities. Concurrently, the digital revolution offers a paradoxical scenario: it serves as a catalyst for women's empowerment through access to digital education, telemedicine, and e-commerce, yet it also underscores the digital divide. A considerable number of Indian women are marginalized from this digital boon due to socio-economic limitations and a lack of digital literacy, further entrenching gender disparities and limiting their participation in the digital economy. To navigate these complexities, India requires context-specific, nuanced strategies that not only embrace technology as a tool for gender inclusion but also earnestly address the digital divide. Initiatives aimed at enhancing digital literacy and access, coupled with ongoing efforts to dismantle socio-cultural obstacles, are vital to empower Indian women and girls fully, enabling them to leverage digitalization's benefits for greater equality and empowerment.

DEVELOPMENT OPPORTUNITIES FOR WOMEN

The landscape of development opportunities for women is multifaceted, encapsulating the essential avenues through which women can realize their full potential and contribute to societal advancement. Central aspects include:

- Economic Empowerment:** Economic empowerment is foundational for women's development, advocating for equal access to employment, entrepreneurial opportunities, and financial resources. As delineated by Duflo (2012), economic empowerment is not only about achieving financial independence but also about creating conditions under which women can make life choices freely and autonomously.
- Political Representation:** Ensuring women's participation in political decision-making is crucial for reflective and inclusive governance. Krook and Mackay (2011) argue that political representation goes beyond numerical presence to encompass the influence women have in shaping policy and legislative agendas, emphasizing the need for substantive representation.
- Access to Education:** Education stands as a critical pathway for personal and societal growth. Fuller (2007) posits that access to comprehensive education for women and girls catalyzes empowerment, enabling them to challenge traditional roles and participate more fully in economic and political spheres.
- Health Care:** Access to health care, particularly reproductive health services, is fundamental to women's autonomy and well-being. According to Sen (2009),

health care access is a critical component of development, empowering women to make informed decisions about their bodies and futures.

- Legal reforms:** Legal reforms play a crucial role in advancing gender equality and protecting women's rights. By advocating for gender-sensitive laws, we aim to create a legislative framework that not only recognizes but also actively supports the unique needs and challenges faced by women. Equally important is the strengthening of laws against gender-based violence, a pervasive issue that undermines the safety, dignity, and freedom of women worldwide.

OPPORTUNITIES FOR ENHANCING GENDER INCLUSION

Advancing gender inclusion in today's society demands a comprehensive strategy that encompasses policy innovation, grassroots activism, and corporate engagement. Notable policy reforms, such as enforcing equal pay, providing parental leave, and safeguarding against discrimination, have significantly contributed to narrowing gender gaps. The introduction of gender quotas in politics and business has further encouraged female participation in leadership, highlighting policy's role in enhancing gender inclusivity. Similarly, grassroots and community movements are crucial in driving women's development, particularly through initiatives focused on improving access to education, healthcare, and economic opportunities. These movements leverage local insights and collective efforts to challenge prevailing norms and foster women's progress, their effectiveness amplified by broader support and international collaboration.

In the corporate realm, commitment to workplace inclusivity is critical. Practices like diversity policies, bias training, and mentorship programs are making workplaces more equitable, though challenges like unconscious bias and structural impediments to women's advancement remain. Companies prioritizing gender inclusion not only support social advancement but also enjoy benefits like increased innovation and employee satisfaction, making inclusivity a smart business strategy. These strategies across policy, community, and corporate sectors outline a holistic path towards gender equality. Continuous innovation, engagement, and accountability from all societal sectors are essential for building a more inclusive world for all genders.

CONSTITUTION PROVISIONS FOR WOMEN DEVELOPMENT

India's Constitution stands as a testament to the nation's dedication to fostering an inclusive society where women's rights and opportunities for development are prioritized. It lays out a comprehensive legal framework that champions the cause of gender equality and the empowerment of women across various spheres of life.

- Central to this legal framework is Article 14, which enshrines the principle of equality before the law and the equal protection of the laws, setting a precedent for non-discriminatory practices. Article 15 further strengthens this stance by outlawing discrimination based on religion, race, caste, sex, or place of birth, with a specific provision in clause (3) enabling the state to enact special measures



for the benefit of women and children. This acknowledges the necessity of rectifying longstanding gender imbalances and social injustices.

2. Article 16 complements these by ensuring equal opportunity for all citizens in employment and office appointments under the state, emphasizing the significance of fair employment practices for women. The Directive Principles, especially noted in Article 39(a), require the state to guarantee that both men and women have the right to a decent livelihood. Simultaneously, Article 39(d) advocates for equal pay for equal work, reinforcing the nation's commitment to economic justice and gender equity in the workforce.
3. Article 42 mandates the state to ensure humane working conditions and maternity support, recognizing the importance of accommodating the unique biological and societal roles of women. Finally, Article 51(A)(e) highlights the moral obligation of every citizen to reject behaviors that diminish the dignity of women, thus promoting a cultural shift towards gender respect and equality.

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CONCLUSION

This research highlights the gender equality in India, emphasizing the country's efforts through its constitution, legal reforms, and empowerment initiatives in various sectors like the economy, politics, education, and healthcare. Despite these significant efforts, challenges remain, including socio-economic gaps, the digital divide, and cultural barriers, all of which demand specific strategies for overcoming them. The study underscores the importance of policy innovations, community activism, and corporate responsibility in promoting gender inclusion. Achieving gender equality is a continuous process that requires everyone's commitment to diversity and inclusion. Through innovative and inclusive approaches, India aims to empower women and build a fairer society for all.

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BIOTOPE FEATURES OF OILSEED CROPS, BIOECOLOGY OF DEVELOPMENT OF PEST SPECIES, THEIR DAMAGE

Toreniyazov E.Sh.¹, Sultanbaeva F.A.²

¹Doctor of Agricultural Sciences, Professor

²Assistant, Karakalpakstan Institute of Agriculture and Agrotechnologies

Article DOI: <https://doi.org/10.36713/epra15834>

DOI No: 10.36713/epra15834

ANNOTATION

Among the types of agricultural crops of Karakalpakstan, sunflower, sesame, soybean, safflower species, which have been growing in the area of cultivation in recent years, are spreading in the biotope, and the types of adapted and secondary pests that damage crops, bioecology of development, dynamics, damage the results of research aimed at determining the contribution of types of external factors that affect the level are included.

KEYWORDS: Oil crops, agroclimate, harmful factors, pests, harmfulness, biology, ecology, dynamics, species, distribution areas, entomophages.

JUSTIFICATION OF THE RELEVANCE OF THE TOPIC

The microclimate of the agrobiocenosis of Karakalpakstan is an extra-arid region with cold winters and hot summers, the maximum air temperature rising to 40-45 °C, the average relative humidity of the air 20-30%, and the minimum level falling to 12-20%. As a result of changes in the structure of agricultural farming in recent years, the work has started on the business plans of planting sunflower, sesame, flax plants, which were planted in very small areas in the region, and from unplanted varieties planting drought-resistant varieties of soybean, safflower and increasing the cultivated area. In this way, in the last two years, work has been carried out to increase the area of crops intended for obtaining such oil to 10,000 hectares and to increase the yield.

To fulfil the assigned tasks, it was noted that the results of the research conducted in the fields of crops, the importance of pests, diseases and wild grass among the harmful factors considered as the main elements of biocenosis. The main thing is that in the biotopes of some types of plants, it was found that most types of pests, including adapted species, which are widespread in the region and cause great damage to the types of agricultural crops, appear and develop. Because most of these are fed with vegetative, generative bodies of the plant adversely affecting growth and harvest, it became known that the expected results are not being obtained from the countermeasures to prevent the reduction of the quality and quantity of the harvest.

To solve such a problem that has arisen in the fields of oilseed crops in the region, it is necessary to identify the types of pests that spread in the biotope, to correctly

determine the characteristics of bioecological development, taking into account the changes in abiotic factors in recent years, and to develop and produce countermeasures on a scientific basis and their implementation is a pressing issue for the region today.

METHODS USED FOR RESEARCH

in the conditions of Karakalpakstan, research was carried out in the fields where the types of oilseed crops, their varieties were planted and agro-technical methods corresponding to the agro-climate of the region were used for harvesting [Shamshetov et al., 2003; Ozizov, 2008; Amanov et al., 2017]. The methods of B.P.Adashkevich [1983], Sh.T.Khojaev [2015] was used to determine the types of pests in the biotope and their entomophagous species, V.I.Tansky [1988] – to determine their degree of damage, conducting experiments were carried out by the methods of B.A.Dospekhov [1986].

RESEARCH RESULTS

To obtain oil from the fields of agricultural crops in the agrobiocenosis of Karakalpakstan, sunflower (*Helianthus annuus* L.), sesame (*Ovozamum indicum* L.), soybean (*Glycine hispida* (Mnch) Max.) safflower (*Catthamus tinctorius* L.), quick-ripening and drought-resistant varieties of flax (linacea) are planted in the main areas, it was determined that agrotechnical methods were used taking into account the soil and climatic conditions of the area. The experiments were carried out on the basis of scientific research where it was found that among these types of pests sunflower damaging pests include: turnip moth (*Agrotis Segetum* Schiff.), silver Y (*Phytometra gamma* L.), agapanthia dahli (*Agapanthia dahli* Richt.), types of aphids (Aphidodea), spider mite (*Tetranychus urticae* Koch.), alfalfa plant bug (*Adelphocorus lineolatus* Goeze.), lygus (*Lygus pratensis* L.), Eurasian sunflower moth



(*Homoeosoma nebulella* Hb.); in addition to above-mentioned pests of soybean include: cotton bollworm (*Heliothis armigera* Hb.), beet armyworm (*Spodoptera exigua* Hb.); in safflower - black beet weevil (*Psalidium makillosum* F.), flax moth (*Chloridea peltigera* Schiff), safflower aphid (*Macrosiphum jaceae* L.), safflower root aphid (*Brachyunguis anuraphoides* Nev.), mesogroicus (*Mesogroicus petraeus* Faust.), *larinus* (*Larinus syriacus* Gyll.); in sesame fields – *acmaeodera* (*Acmaeodera ballioni* Gangl.), and several types of locusts (Khodjaev, 2015; Khodjaev, Kholmuradov, 2009; Toraniyazov et al. 2018).

The main types of the specified pests related to the feeding of oilseed crops according to the degree of harmfulness are determined, research was conducted to determine the damage caused to the phases of plant varieties.

The results are presented in Table 1. It can be seen that the microclimate in the biotope proves to be favorable in terms of the types of pests found in the biotopes of oilseed crops of the northern districts of the agrobiocenosis of Karakalpakstan. From May to the end of August, due to the spread of the pest, the turnip moth was found in the isolated fields, it was found that the pest increased to 0.6-1.2 individuals per square meter of sunflower fields in May and damaged 18,6-34,8% of seedlings. It was noted that larvae with an exclamation mark increased in sesame and soybean fields, gnawed the real leaves and damaged 12.6-27.4% of seedlings.

It was found out that the type of cotton bollworm is the main pest of soybeans, causing damage to 23,8-36,4% of the examined plants in July and August and causing some damage to the crop.



Table 1
Types of pests that appear in the biotope of oilseed crops, the degree of harmfulness they cause
Karakalpakstan, Shimbay, Kegeyli, Nukus districts, 2022-2023 yy.

Types of pests	Sunflower				Sesame				Soybean				Safflower				Flax			
	5	6	7	8	5	6	7	8	5	6	7	8	5	6	7	8	5	6	7	8
Agrotis segetum Den. et Schif.	+	+++	+	-	-	+	++	-	+	++	+	-	+	+	-	-	-	+	+	-
Agrotis exclamati L	+	+++	+	-	-	+	++	-	+	++	+	-	+	+	-	-	-	+	+	-
Heliiothis armigera Hb	-	-	-	-	-	-	-	-	-	+	+++	+++	-	-	-	-	-	-	-	-
Phytometra gamma L.	-	+	+	++	-	+	+	++	-	+	+	++	-	+	+	++	-	+	+	++
Spodoptera exigua Hb	+	+++	+	-	+	+++	+	-	+	++	+	-	+	++	+	-	+	++	+	-
Aphididae	-	-	-	+	-	-	+	++	-	-	+	++	-	+	+	+	-	-	+	+
Tetranychus urticae Koch.)	+	+	++	++	-	-	+	++	-	-	+	++	-	-	+	++	-	-	+	++
Miridae	+	+	+	++	+	+	+	++	+	+	+	++	+	+	+	++	+	+	+	++
Sitona													-	+	++	++	-	+	++	++
Clon cerambycinus Sem	-	-	+	+	-	-	+	+	-	-	+	+	-	-	+	+	-	-	+	+
Acrididae	-	-	-	+	-	-	++	+	-	+	+	+	-	+	++	+	-	+	++	+
Homoeosoma nebulella Hb	-	+	++	++	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Entomophages	-	+	+	++	+	-	+	+	+	++	-	+	+	+	++	-	+	+	+	++

Conditional signs: -did not appear; - -few, +-average, +++-appeared in a great amount.



It was found that the silver Y, which is widespread in oilseeds, fed on young leaves, and the damage caused by beet armyworms, which appeared in May and June, reached a very high level. It was noted that 67.1-84.3% of the leaves of seedlings were damaged and the crops were completely destroyed in places where on average 8.5-14.6 worms were found in 100 plants of sesame fields.

In the fields of oilseeds, aphids of acacia and vegetable aphid have sufficient development dynamics, and in sesame, safflower and soybean, some do not resemble the identified varieties in terms of morphological characteristics, it became known that there is a need to carry out systematic work on this.

Among the pests, the spider mite species has expanded its range since the second half of the vegetation period, in some fields, it was noted that the number of leaves with increased physiological processes reached 41.3-54.8%, and it was known that the level of harmfulness was high.

In addition, many types of locusts around the fields continue to spread in the fields of oilseeds, and in July, it was noted that the leaves of the plants were damaged by a strange attack in the fields of sesame, safflower, and flax.

The species of entomophages increased along with the mentioned pests in the fields of oil crops, and the species that appeared in the fields of sunflower, sesame and other crops from June developed until the end of the vegetation period, proving that it is the most favorable biotic factor in reducing the number of pests.

CONCLUSION

In the conditions of Karakalpakstan, the cultivation area has increased in recent years, and the cultivation of sunflower, sesame, soybean, sorghum, and flax species, which are being cultivated as the main agricultural crops, is because the microclimates and phases of plants that appear in biotopes are valuable nutrients, it became known that many types of pests accumulate and live as the main element of the biocenosis. Among them, the gnawing moths cut off the seedlings of the plant, cotton bollworms damage the fruits of the soybeans, beet armyworms and others, and the locusts gnaw the leaves, species of aphids, spider mites, legcuffs cause damage by sucking food elements. It was noted that the development of the Eurasian sunflower moth in sunflower leads to the death of the main crop. It has been confirmed by the results of scientific research that oilseed fields of the mentioned species are highly harmful due to favorable availability of abiotic and biotic factors.

SUGGESTIONS FOR PRODUCTION

In order to reduce the level of damage caused by pests in oilseed crops, it is necessary to determine the characteristics of growth and development according to the external environmental factors of each crop type. It is necessary to determine the features of bioecological

development, dynamics, and factors favorable to the level of harmfulness of varieties that are distributed in the conditions of the region, including those that have become the main biotic factor as adapted pests of oil crops. It is necessary to determine the types of entomophages that multiply in the fields along with pests, determine the factors that positively affect the bioecology of development, and develop ways of using their livelihood needs to carry out biological countermeasures on a scientific basis. It became known that it is necessary to establish the phenological development periods of the pests that appear in the field related to plant types, varieties, planting periods, apply agrotechnical, biological and chemical methods against pests, develop them, and create a scientific basis for the control system.

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PRODUCTION TECHNOLOGY OF ACETONE PRODUCT DERIVED FROM ACETYLENE

Omanov Bekhruzjon Shukhrat ugli¹, Khatamova Mukhabbat Sattarovna²,
Adizqulova Oftob Ulug'bek qizi³, Islomova Gulshoda Farhod qizi⁴

¹Doctor of Philosophy of Technical Sciences, Associate Professor, Navoi State Pedagogical Institute, Uzbekistan,

²Candidate of chemical sciences, Associate Professor, Navoi State Pedagogical Institute, Uzbekistan

³Teacher of Chemical Technology, Navbahor Multidisciplinary Technical College, Uzbekistan

⁴Master's degree in teaching methods of exact and natural sciences (Chemistry), Navoi State Pedagogical Institute, Uzbekistan

ABSTRACT

Acetone (dimethyl ketone, 2-propanone, CH_3COCH_3) is a clear, colourless, volatile liquid with a sweet odor. The effect of various factors (temperature, volume velocity, acetylene: water ratio, catalyst composition, etc.) on the product yield and process selectivity in the catalytic hydration reaction of acetylene was studied. The kinetic laws of the catalytic hydration reactions of acetylene were studied and the mechanisms of their progress were proposed, and the additive kinetic equations representing the progress of the reactions were proposed (the mean square deviation does not exceed 5%). For the first time, improved and compact technologies for obtaining acetone by hydrating catalytic acetylene have been developed.

KEYWORDS: Acetone, water, acetylene, catalyst, methyl methacrylate, YKS, selectivity

INTRODUCTION

About 96% of acetone production worldwide is a by-product of phenol production. Thus, many trends in the phenolic industry also apply to acetone. The global acetone industry is driven by the solvent sector, which accounts for 34% of global demand. Global solvent demand for acetone will continue to maintain a steady growth rate until 2022. Methyl methacrylate (MMA) is the second largest end use of acetone. In 2017, global demand for MMA resin accounted for 25% of total acetone consumption. Bisphenol A is the third largest sector in demand; however, by the end of the forecast period, BPA demand will exceed MMA demand.

Acetone (dimethyl ketone, 2-propanone, CH_3COCH_3) is a clear, colorless, volatile liquid with a sweet odor. It is the simplest aliphatic ketone and the most commercially important. Almost all acetone production in the world occurs by peroxidation of cumene with phenol as a by-product. Its main chemical uses are as an intermediate in the production of acetone, cyanohydrin (MMA), bisphenol A (BPA), aldehyde and alcohol (aldol) for methyl methacrylate. Direct use of solvents accounts for the majority of global demand.

The following users are expected to experience positive growth during the forecast period and overall global acetone demand will continue to improve.

1. European market - Belgium, Finland, France, Germany, Italy, Poland, Russia, Spain
2. Asia-Pacific market - China, India, Japan, Singapore, South Korea, Taiwan, Thailand
3. North American market - USA
4. Latin American market - Argentina, Brazil
5. African and Middle Eastern market - Saudi Arabia, South Africa

EXPERIMENTAL PART

The effect of various factors (temperature, volume velocity, acetylene:water ratio, catalyst composition, etc.) on the product yield and process selectivity in the catalytic hydration reaction of acetylene was studied.

When studying the effect of temperature on the yield of acetone in the presence of catalyst № 9 with high activity and productivity, it was found that the optimal temperature for the acetylene hydration reaction is 425-430°C (Table 1).

Table 1. The effect of temperature on the conversion of acetylene to the yield of acetone and the selectivity of the process (cat №9)

№	Temperature, °C	Total conversion of acetylene, %	Yield of acetone, %	Selectivity to acetone S %
1	300-320	45.1	22.9	50.7
2	325-350	66.2	47.6	71.9
3	355-370	79.4	62.2	78.3
4	375-390	87.2	73.2	83.9
5	395-420	89.9	77.7	86.4
6	425-430	97.2	93.6	96.3
7	435-475	90.1	82.4	91.4
8	480-500	82.4	70.5	85.5



As can be seen from the table, when the temperature reaches 425-430°C, the productivity of acetone formation is 93.6%, and the selectivity of the process to acetone is 96.3%.

The effect of partial pressures of reagents on the kinetic laws of the process was carried out by changing the partial pressure of one reagent while keeping the partial pressures of other reagents constant. The required amount of pure argon gas was injected into the reaction zone (area) to keep the linear velocity of the initial mixture constant.

The catalyst volume was adjusted accordingly to keep the specific acetylene flow rate constant. As a result of the study of the influence of the partial pressures of acetylene and water on

$$\lg K_p = \frac{17637}{T} - 2,611 \lg T + 1,356 \cdot 10^{-3} T - 0,092 \cdot 10^{-6} T^2 - \frac{0,223 \cdot 10^5}{T^2} - 3,794$$

DISCUSSION PART

(99.8%) Acetylene (1) is delivered from the tank (2) to the upper part of the reactor (hydrolysis unit) for hydration through the compressed acetylene pipeline under a pressure of 0.18 MPa through the compressor. For the safe transportation of compressed acetylene, steam is supplied to the acetylene pipeline, and it is heated to a temperature of 270°C in a heating furnace. To prevent local overheating of the steam acetylene mixture at the point where the transport steam is introduced, the acetylene pipeline is equipped with a shutter for cooling the mixture with circulating water.

The superheater (3) is a rectangular chambered firebox with a stack of steel tubes inside. The furnace consists of 2 parts - radiant, where the steam is superheated due to the combustion of natural gas, and conversion, where the steam is superheated due to exhaust gases.

The steam entering the conversion section of the steam superheater is heated to a temperature of 270°C and split into two streams. A stream is sent to mix it with acetylene for safe transport.

Another steam stream from the conversion part of the furnace enters the coils of the radiation part, where it is heated to a temperature of 500°C.

When the temperature exceeds 350-400°C, catalyst dust starts to come out. Steam heated to 500°C in a heating furnace and (2) acetylene from the compressor are mixed in a ratio (1:4) in a mixer (4) installed at the top of the reactor in order to reduce catalyst expulsion.

the kinetic laws of the reaction, it was found that the yield of acetone increases with a decrease in the partial pressure of acetylene. At this time, the total conversion of acetylene increases, while the selectivity of the reaction to acetone decreases. Based on the study of the kinetic laws of the reaction, the following kinetic equation of the reaction of obtaining acetone by catalytic hydration of acetylene was proposed:

$$K_p = \frac{P_{C_3H_6O} \cdot P_{CO_2} \cdot P_{H_2}^2}{P_{C_2H_2}^2 \cdot P_{H_2O}^3}$$

$\lg K_r$ the relationship between and temperature is expressed as:

Reactor (5) is a vertical apparatus, inside which 10 layers of ZnO:Fe₂O₃:Cr₂O₃:MnO₂:V₂O₅/HSZ catalyst are placed and 10 plates are installed above the catalyst layer of each layer. The plates are designed to prevent condensate delivered to the hydrator through the nozzles to dissipate the heat of reaction from reaching the catalyst surface.

The acetylene-steam mixture entering the upper part of the reactor passes through 10 successive layers with a solid catalyst, and the reaction occurs on its surface. Acetylene hydration is carried out at a temperature of (425-430) °C. At the beginning of the reaction period, the temperature is maintained at 425°C. As the activity of the catalyst decreases, the temperature of the hydration process gradually increases to 435°C.

Contact gases formed as a result of the reaction from the lower part of the reactor (6) are cooled to a temperature of 185°C in a steam boiler.

After the steam boiler, the gases enter the cooler of the refrigerator (7), where they are cooled by circulating water to a temperature of 100°C and sent to the next cooler (8). Here they are cooled again with circulating water to a temperature of 75°C. In this case, the main part of acetone, acetic acid and crotonic acid dissolved in water in the condenser is condensed. Non-condensable gases with a temperature of 75°C enter the next cooler (9) where they are cooled with cold water to a temperature of 35°C. The obtained acetone water is condensed in coolers (7), (8), (9) and sent to tank (11).

Acetone and flue gases containing carbon dioxide (SO₂), nitrogen (N₂), oxygen (O₂), methane (CH₄), carbon monoxide (CO) washed from the reaction products are released into the atmosphere through a 40-meter high chimney (10).

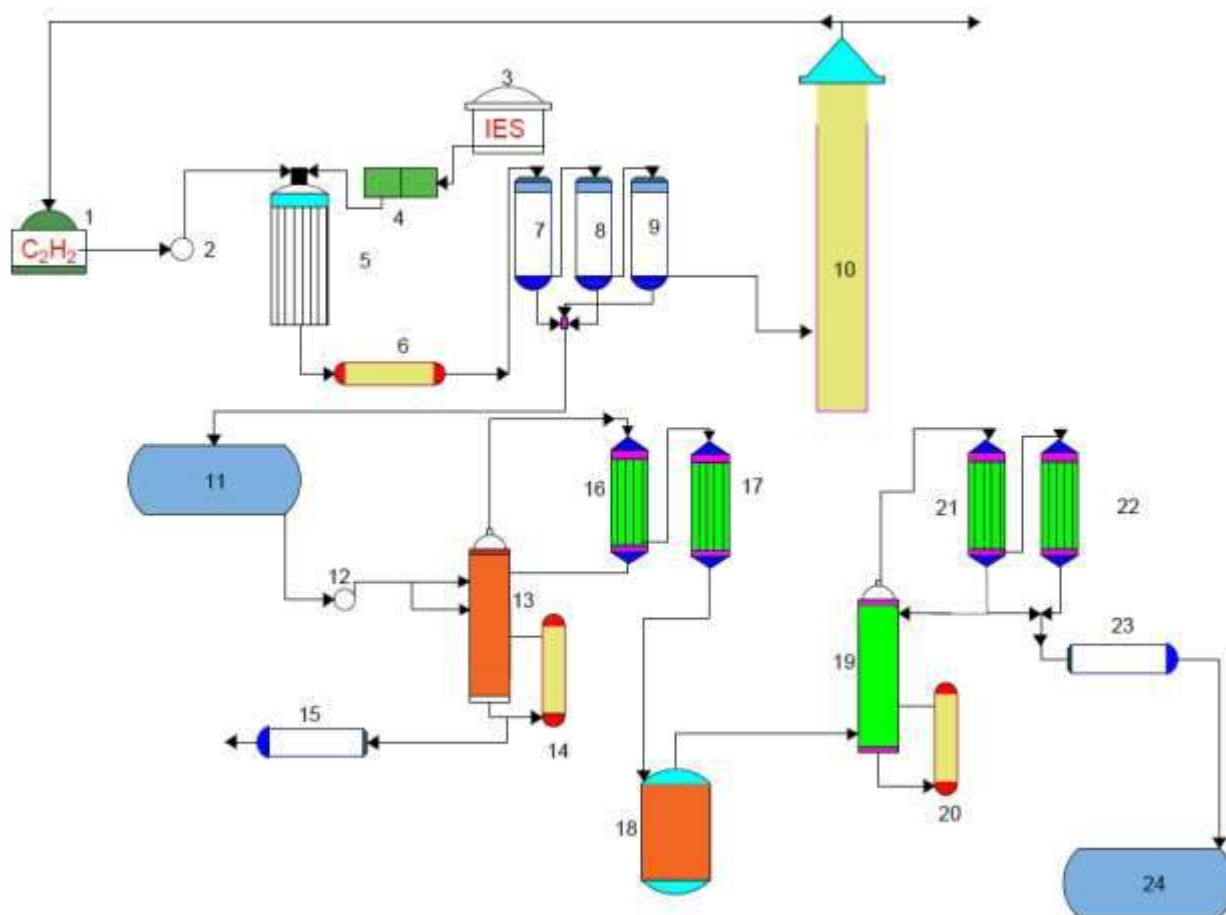


Figure 1. Technological scheme of obtaining acetone from acetylene and water

1-acetylene; 2, 12th pump; 3-water; 4-evaporator; 5th reactor; 6, 14 and 20-heater; 7, 8 and 9- coolers; 10-gas processing tower; 11th collector; 13, 19-rectification column; Alkali 18; 15 and 23-small cooler; 16, 17, 21 and 22 deflegator; collector 24

Catalyst regeneration. In the process of acetylene hydration, carbon and tar products accumulate on the surface of the catalyst, which leads to a decrease in its activity. After 72 hours of contact, the catalyst is regenerated using a mixture of steam and air heated to a temperature of 500-550 °C. Before supplying air to the hydrator, the system is vaporized and purged with nitrogen, blowing off acetylene, as well as combustible organic products formed during the hydration reaction and deposited on the surface of the catalyst. Catalyst regeneration takes 20-24 hours.

Rectification of an aqueous acetone solution. Aqueous acetone (3-7% acetone, 0.1% croton aldehyde, 0.01% acetic aldehyde) containing aqueous acetone collected in tank (11) with a temperature of 50-70°C is fed from the upper part of the rectification column (12) through a pump (13). In the lower part of the rectification column (14), the temperature is heated up to 130°C using steam. The temperature in the upper part of the column is 115-120°C. The fusel water (15) from the lower part of the column is cooled to 40-45°C through the cooler and goes to BXO. The main function of this rectification column is to separate acetone from aqueous acetone.

Acetone (16) in a par form from the top of the column is cooled with circulating water through the dephlegmator and fed as phlegm (saturation) from the top of the column. Gases that have not turned into liquid are cooled by cooled water in the next

(17) dephlegmator. In dephlegmators (16-17), a part of cooled acetone is given as phlegm to saturate the column, and the rest is passed through 40% NaOH solution in dephlegmator (18).

Acetone vapors (19) at 45-50°C purified from acetaldehyde are sent to the lower part of the rectification column. This is heated to a temperature of 80-82°C using a heater in the lower part of the rectification column (20). The temperature at the top of the column is 55-58°C. Acetone vapors in the upper part of the column are cooled and condensed in reflux condensers through a dephlegmator installed in series (21-22). Part of the technical acetone is returned to the top of the column as phlegm. The remaining part (23) is cooled in a cooler and (24) is pressed with nitrogen into the collector. According to this technology, it is possible to obtain high purity acetone, not less than 99.5%.

CONCLUSION

Thermally stable, high activity, selectivity and productivity nanocatalysts were created for the ZnO:Fe₂O₃:Cr₂O₃:MnO₂:V₂O₅/HSZ reactions of catalytic hydration of acetylene from local raw materials based on "wet" and suspension technology. The kinetic laws of the catalytic hydration reactions of acetylene were studied and the mechanisms of their progress were proposed, and the additive kinetic equations representing the progress of the reactions



were proposed (the mean square deviation does not exceed 3%). For the first time, improved and compact technologies for obtaining acetone by hydrating catalytic acetylene have been developed.

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INSIGHTS INTO BODY DONOR'S ATTITUDES AND PERSPECTIVES; A SURVEY ON VOLUNTARY BODY DONATION

Dr Arpitha S^{1*}, Dr Sireesha S R^{2*}, Dr Uma B Gopal^{3*}

^{1&2}.III-year PG Scholar, Department of Rachana Shareera, SDM College of Ayurveda and Hospital, Hassan.

³.Professor and Head, Department of Rachana Shareera, SDM College of Ayurveda and Hospital, Hassan.

Article DOI: <https://doi.org/10.36713/epra16225>

DOI No: 10.36713/epra16225

ABSTRACT

The study delves into the motivations behind voluntary body donation (VBD) by conducting a retrospective analysis of 120 registered body donors at the Department of Rachana Shareera, Sri Dharmasthala Manjunatheshwara College of Ayurveda and Hospital, Hassan. The historical context of body donation is explored, tracing its roots back to Hindu religious literature and highlighting key milestones, such as the enactment of the Anatomy Act in India in 1948.

The primary aim of the study is to evaluate the reasons driving individuals to voluntarily donate their body after death. The materials include the body donor register and relevant literature from Ayurvedic classical texts, contemporary science, journals, publications, and articles. The methods involve a retrospective analysis of the registered voluntary body donors. The study sheds light on the multifaceted reasons behind voluntary body donation, providing insights that can support educational and awareness initiatives in promoting Voluntary body donation.

KEY WORDS: Voluntary Body donation, Body Donors

INTRODUCTION

Without Practical knowledge, theoretical knowledge will be incomplete. So, for better understanding of human anatomy, dissection plays a very important role. Voluntary body donation (VBD) programs form the backbone of cadaveric teaching and learning in medical schools. As famous quotation says "LIVE AFTER DEATH", tells us the importance of Body donation. The history of body donation can be traced long back to Puranas, the Hindu religious literature which narrates a story of Vrutraasura, the troublesome demon, of whom the Gods and the mankind wanted to get rid of. On the request from Lord Indra, the great sage Dadhichi, by his power of yoga, left his body. His bones were utilized to make the weapon Vajra, using which the demon was killed¹. This may be considered as the first body donation in the world.

In Sushruta Samhita kala there is a reference of cadaveric dissection to obtain full-fledged knowledge of human body². This implies that may be in that period also, there were some people who donated the bodies instead of performing *Maranotthara Samskara* (rituals to be performed after death).

During the time 300 BC, Herophilus was the first scientist to systematically perform scientific dissections of human cadavers. The early Christian author Tertullian states that Herophilus vivisected at least 600 live prisoners, however this account has been disputed by many historians. He is often seen as the Father

of Anatomy³. During 13th century –Pope Boniface prohibited dissection of human body⁴.

In 1750-1832- there was selling of dead body. People also resorted to murder to retrieve cadaver⁵. In 1828 W. Burke and W. Hare were convicted for 16 murders⁶.

In India, the Anatomy Act was enacted in 1959 to provide unclaimed bodies of deceased persons to hospitals and medical and teaching institutions for the purpose of anatomical examination and dissection⁷.

According to Wikipedia "Body donation, anatomical donation, or body bequest is the donation of a whole body after death for research and education⁸. "In spite of having so much cultural and religious beliefs some people come forward to donate their bodies the reasons may be of following-

1. Self-willingness to help for education
2. Inspiration from others and other trust or societies
3. No family members to perform their final rites
4. Son/daughter not taking care of parents
5. Economically poor to perform final rites
6. Others.

So, a retrospective study has been conducted in Sri Dharmasthala Manjunatheshwara College of Ayurveda and Hospital, Hassan to evaluate the reason behind voluntary body donation.



AIM

1. To evaluate the reasons for Voluntary Body Donation.

MATERIALS AND METHODS

A) Materials:

1. Body donor register in Department of Rachana Shareera, SDMCAH Hassan.
2. Ayurvedic classical text books, related books of contemporary science, various journals, publications, articles.

B) Methods:

A retrospective study has been carried out among 120 voluntary body donors, who were registered in Department of Rachana Shareera, SDMCAH Hassan.

RESULTS

The present retrospective survey study was conducted among 120 Voluntary Body Donors, who have registered in Department of Rachana Shareera, Sri Dharmasthala Manjunatheshwara

College of Ayurveda and Hospital, Hassan, to evaluate the reason behind voluntary body donation. It shows results like, a total of 65% of voluntary body donors are willing to donate their bodies for education purpose to help students in academics which comes under first category. Out of 120, 32(26.6%) members are inspired by some trust and societies and also by friends and family members who have already registered for Body donation. About 3.3% of people who have registered for Voluntary Body Donation as they do not have any family members to perform their final rites. And about 3 members (2.5%) falls into fourth category where their Son/Daughter are not taking care of their parents. About 0.83% fall under fifth category who are economically poor to get their final rites performed. Out of 120 members, 3 members falls under sixth category for various reasons like personal relationship problems, being atheist, who is not having any interest in religious rites, and some who are in old age home. (Figure No.1: Pie chart showing the results of reasons behind voluntary body donation in percentage).

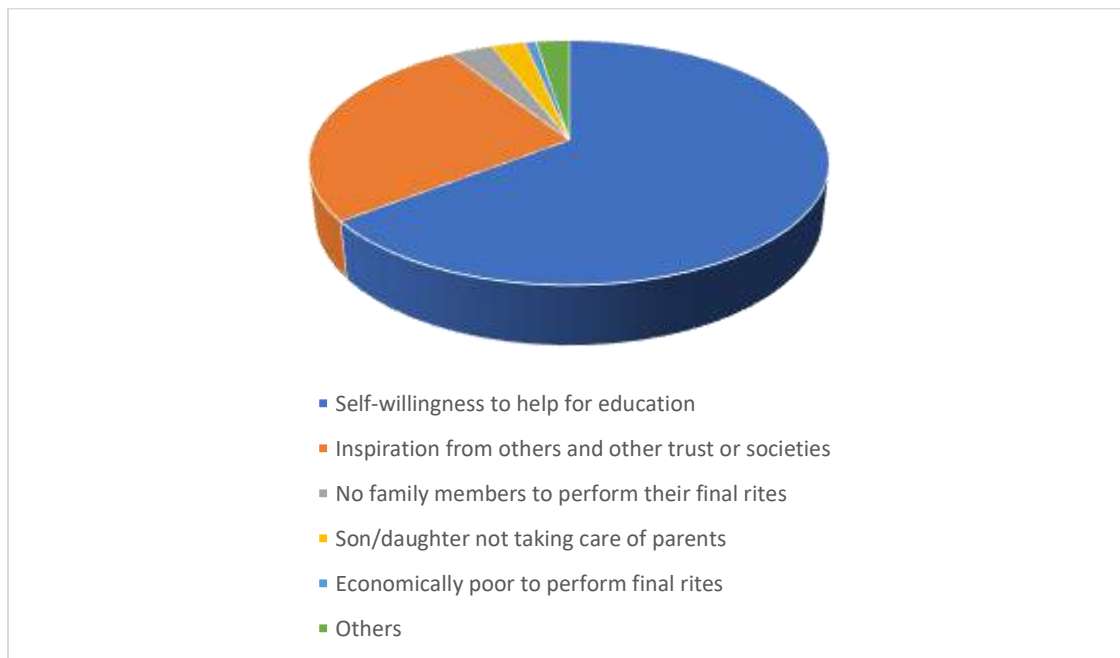


Figure No.1: Pie chart showing the results of reasons behind voluntary body donation in percentage

Among 120 Voluntary Body Donors, 53 are males, 67 are females (Figure No.2: Pie chart showing the results of Gender ratio for voluntary body donation in percentage). When we take age into consideration 7 members fall under age less than 35 years and 113

members fall under age more than 35years (Figure No.3: Pie chart showing the results of people showing interest in voluntary body donation based on their Age in percentage).

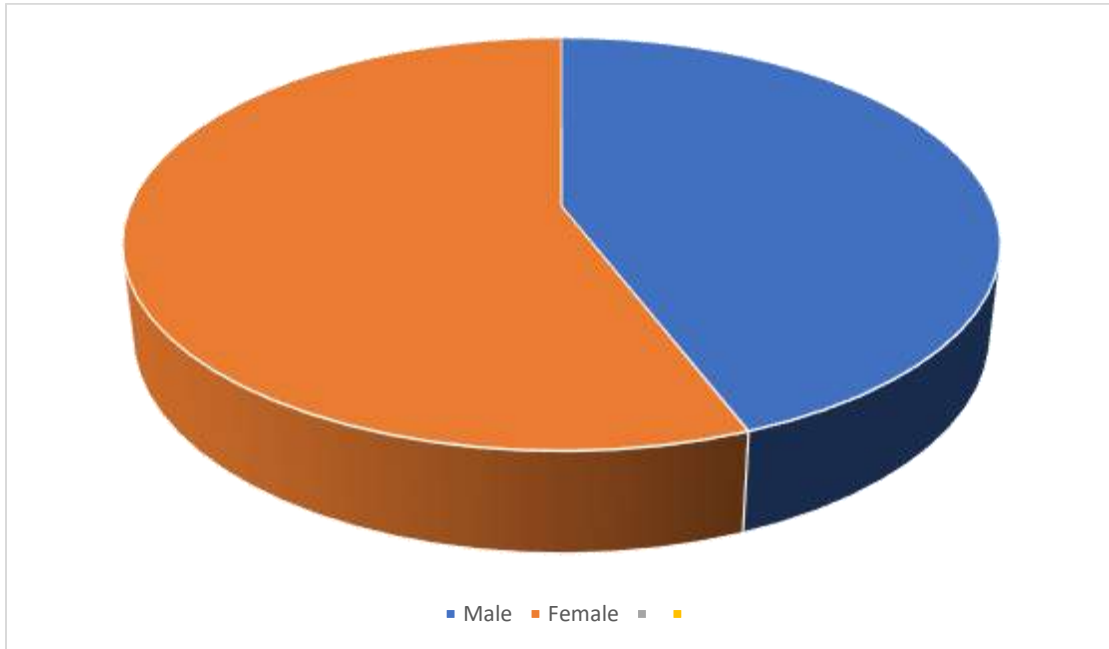


Figure No.2: Pie chart showing the results of Gender ratio for voluntary body donation in percentage

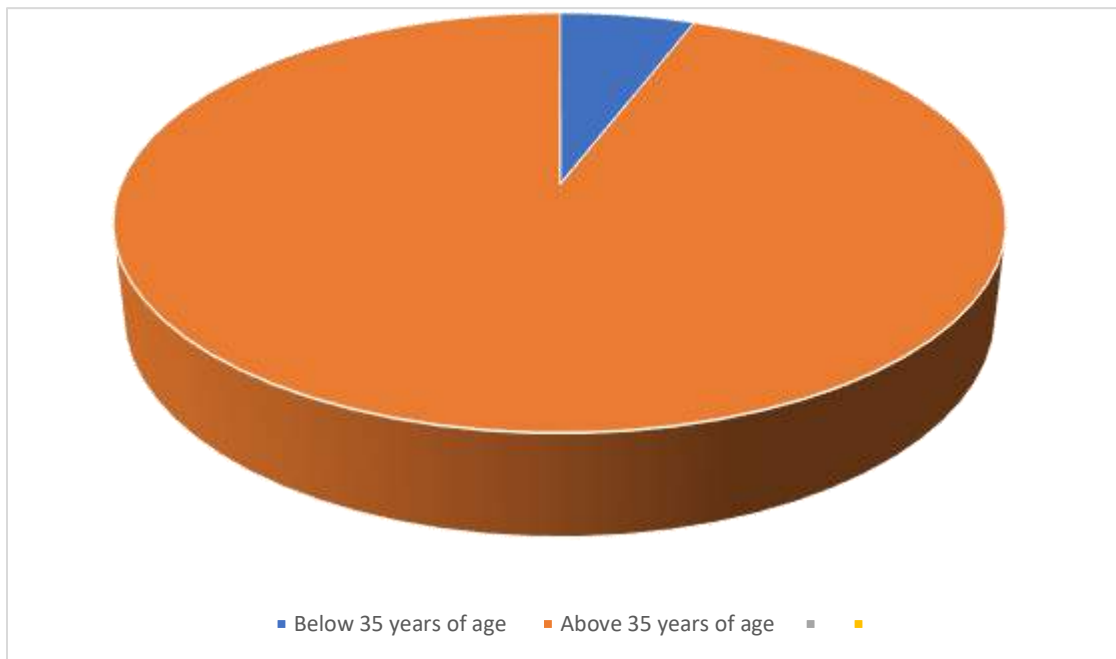


Figure No.3: Pie chart showing the results of people showing interest in voluntary body donation based on their Age in percentage.

DISCUSSION

Among 120 members, 65 percent are eager to offer their bodies in order to help medical education; both well-educated and uneducated people are equally interested in VBD as a means of assisting students with their academic endeavors, with the belief that their bodies should not be wasted. Even if, they pass away, they wish their body to be fully utilized.

26.6% of members say that they are motivated to donate their bodies by their friends, family members, relatives, neighbors and other trusts and societies. Even though they were unaware of VBD, they learnt about it from friends and family. Some of them who were motivated by the Trust and societies after becoming aware that, their ultimate mission in life is to serve society in whatever way they can, like providing food, monetary support or by donating their properties for the development of schools/hospitals or Ashrams and likewise. As these cluster of



people often attended Satsanga, Viveka jagrithi camps, Spiritual talks by Seers which has motivated them to decide to donate their eyes after their demise and also the whole body for medical education and research.

3.3% of the individuals who have registered for voluntary body donation do so because they have no family members who are willing to carry out their last wishes. In that some of them don't have kids to carry out their last wishes, and some of them wish to pass away quietly without causing any trouble to others. Furthermore,

2.5% of individuals who registered for voluntary body donation stated that their son or daughter was not caring for their parents. In certain instances, children who have migrated abroad may not be prepared to care for their parents. 0.83% of people cannot afford to have their last rites done. Due to their isolation and lack of access to their children, they are unable to have their last rituals carried out.

Among 120 members, three are in an assisted living facility like Orphanage center, old age home, have personal relationship issues, are atheists, or have no interest in participating in religious rituals.

CONCLUSION

The present study has shown that most of the people who have registered for VBD, are donating their bodies self-willingly for the purpose of Medical education, to help students in academics. Following this, the inspiration from other trusts, societies, friends, and family members ranks as the second reason why the majority of people are eager to donate. People who have registered with no family members to perform their final rites, and Son/daughter not taking care of parents are equally less while people who are economically poor to get performed their final rites are very few. Members with different reasons like personal relationship problems, being atheist, who is not having any belief in religious rites, and some who are in old age home are also very few.

Demographically, the study reveals that both male and female actively participate in voluntary body donation. Those above 35 years show an extreme interest in body donation, while individuals below 35 years exhibit comparatively lower interest. The findings emphasize the crucial role of voluntary body donation in medical education and highlight the diverse motivations that drive individuals to make this altruistic contribution.

In conclusion, the study sheds light on the multifaceted reasons behind voluntary body donation, offering insights that can inform educational and awareness initiatives in promoting this noble cause.

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A COMPREHENSIVE REVIEW OF HERBAL FACE SERUM

Miss. Gauri Deshmukh, Miss. Vaishnavi Katkar, Mr. Sanjay Garje, Mr. Gaffar Sayyad
Sajvpm's College of Pharmaceutical Science and Research Centre, Kada

ABSTRACT

We delve into the scientific basis behind herbal formulations, exploring their potential benefits and addressing consumer concerns. Through an extensive literature review, this paper aims to present a holistic view of herbal face serums, aiding consumers, skincare professionals, and researchers in making informed decisions.

The growing consciousness about skincare among women in India, particularly the emphasis on reduced wrinkles ageing and a youthful appearance. The focus on serums, known for their concentrated ingredients and deep skin penetration, aligns with the demand for effective skincare products. The growing emphasis on skincare reflects a societal shift towards prioritizing personal appearance and beauty standards.

KEYWORDS - Herbal Face Serum, Anti-ageing, Anti-wrinkle, Skincare

INTRODUCTION

Skin serums are formulated to deliver targeted and potent ingredients to address specific skincare concerns. They are designed to penetrate the skin deeply and provide nourishment, hydration, or address issues like wrinkles or pigmentation. Using a serum before moisturizing can enhance the overall effectiveness of your skincare routine.

The serum's small molecules facilitate deep skin penetration, enhancing its effectiveness in targeting specific skincare concerns like pigmentation and signs of aging, face serums are potent skincare products designed with higher concentrations of active ingredients, making them effective in addressing specific cosmetic concerns. The absence of unnecessary additives and fillers in serums allows for a more direct and efficient treatment of skin issues. With a thinner consistency, serums facilitate rapid absorption, deeper penetration into the skin, and often have higher concentrations of active ingredients compared to creams. This makes them ideal for nourishing and layering on the skin, providing targeted benefits.

HISTORY OF FACIAL SERUMS

Facial serums have a rich history dating back to ancient civilizations. Egyptians used natural oils and plant extracts for skincare, while ancient Greeks and Romans created formulations

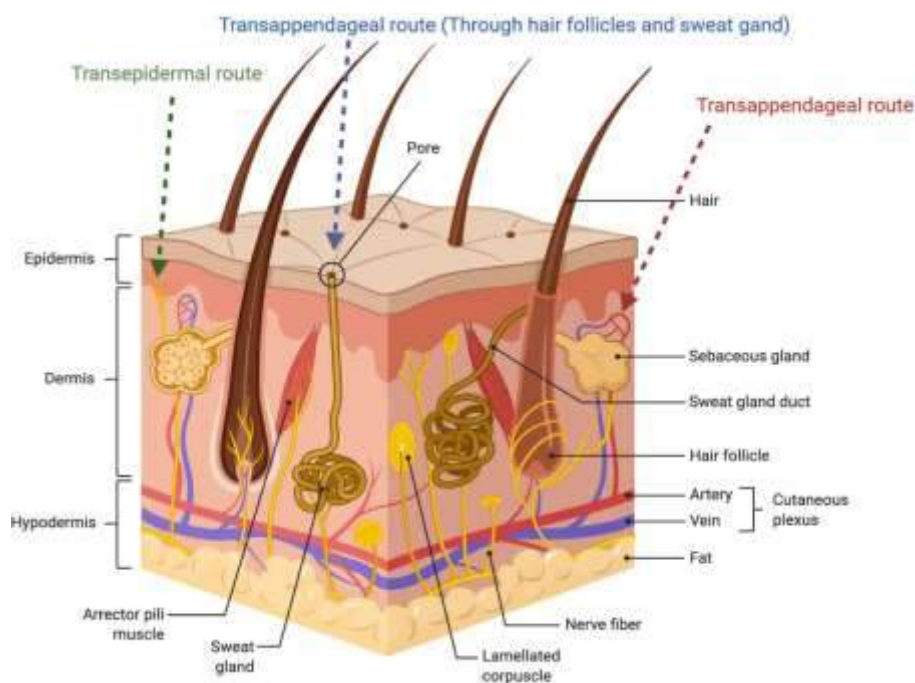
with ingredients like olive oil. In the 20th century, advancements in cosmetic science led to the development of modern serums, incorporating ingredients like hyaluronic acid and antioxidants for targeted skincare benefits. Today, facial serums remain popular for their concentrated, fast-absorbing formulations addressing various skin concerns.

What are Face Serums - Their lightweight nature and concentrated formulation indeed make them effective for addressing skin concerns at a deeper level.

Cosmetic Serum - Serums are formulated with a high concentration of active ingredients, making them more potent than regular creams. This allows them to address specific skincare concerns more effectively.

BASICS OF FACE SERUM

Face serums are formulated to deliver a high concentration of active ingredients without unnecessary additives. Their thinner consistency and absence of heavy oils enhance absorption and penetration, making them effective for nourishing and layering on the skin. The focus on essential ingredients without emulsifiers ensures optimal delivery of active agents, such as vitamins or botanical extracts.

Fig- Mechanism of drug penetration through skin**FUNCTION OF SKIN**

1. Provide a barrier of defense against harmful substances, mechanical, thermal and physical harm.
2. Prevents moisture loss.
3. Minimizes the negative effects of UV light.
4. Aids in temperature regulation.
5. Serves as a sense organ.

ADVANTAGES OF FACE SERUM

1. Keep skin moisturised
2. Help remove skin blemishes
3. Anti-aging benefits
4. Helps protect against the future.
5. Not effective for all skin issues.
6. Can be pricey.
7. Difficult to select the proper one.
8. If not used effectively, it risked being wasted.

FIVE TYPES OF ORGANIC FACIAL SERUM FORMULATIONS**Anti- Aging Serums**

These components, such as Aloe Vera, and various herbs, aim to address different aspects of skin aging and promote a more youthful appearance.





The Oil Serum

Oil serums are often used in skincare routines to provide hydration and nourishment to the skin. They contain various oils, such as olive oil, coconut oil, which can help moisturize and improve the skin texture. When incorporating an oil serum into your routine, apply a few drops after cleansing and before moisturizing for added hydration and a healthy glow.



Gel Serums

Gel Serums are lightweight skincare products that often combine the benefits of a gel and a serum. They're designed to provide hydration, target specific skin concerns, and absorb quickly without a heavy feel. Popular ingredients include hyaluronic acid for moisture and various antioxidants for skin nourishment.



The Water Based Serums

Is a skincare product formulated with water as its main ingredient? It's lightweight and suitable for various skin types, providing hydration without a heavy feel. Look for serums containing hyaluronic acid or glycerin for effective moisturization.



The Emulsion Serums

Emulsion Serums typically combine water and oil components to provide hydration and nourishment to the skin. They're versatile for various skin types, offering a lightweight feel with moisturizing benefits.



Theory of Face Serum Herbal face serums are typically formulated with plant-based ingredients known for their skincare benefits. These serums often contain extracts, oils, and other botanicals chosen for their hydrating, antioxidant, anti-inflammatory, or anti-aging



properties. While each serum may vary in ingredients, common botanicals include aloe vera, saffron oil, and chamomile. The theory behind these serums is to provide natural nourishment to the skin, promoting a healthier complexion without harsh chemicals.

1. Plant oils such as organ oil, jojoba oil, saffron oil evening primrose oil for hydration and nourishment.
2. Herbal extracts like green tea extract, chamomile extract, or calendula extract for their antioxidant and soothing properties.
3. Essential oils such as lavender oil, tea tree oil, or rosemary oil for fragrance and additional skincare benefits.
4. Hyaluronic acid for its hydrating properties and ability to plump the skin.
5. Vitamin C for its brightening and antioxidant effects.
6. Aloe Vera gel for its soothing and moisturizing properties.



DIFFERENT TYPES OF SERUMS AND THEIR FEATURES

Types	Technology	Features
Transparent or semi-transparent lotion type	Solubilization, micro emulation, liposomes, Disc like capsule	In general, contains more humactant than lotion. The texture may be lotion type solubilization, transparent adjusted through the selection of micro emulation or semitransparent humactant and water soluble polymer, liposomes and varying their combination. this is most general form of serum preparation
Emulsion Type	o/w type w/o type w/o/w type	As the type of contain large amount of emollient it is suitable for preparation containing large amount of U.V absorber and oily ingredients the w/o type is suitable for preparation requires water repellence
Oil Type		In which the texture is adjusted by solid or semi-solid oils and animal's fats or plants oils in different proportions as texture of this type is not good as that



		of other preparation it is disappearing from market
Two agents mix together type	In addition to above spray, dry, microcapsule technology are used	In order to prevent instability in pharmaceutical agent and preparation or to affect a visual change two agents are mixed together to use they are liquid powder combination
Other	Lotion with powder type much alcohol types	Serum for t-zone which secrets including sebum absorbing powder increases lasting powder of makeup essence having a germicidal effect for ace preparation

How to use Face Serum - For using serums based on climate and skincare routines. Applying serums before heavier products in the morning and evening can optimize their effectiveness by allowing active ingredients to penetrate deeply. This sequence helps ensure maximum benefits for your skin.

Benefits of using Face Serum - It includes antioxidants, vitamins, and other ingredients that can address specific skin concerns such as fine lines, wrinkles or hydration. The lightweight nature of serums allows them to be easily layered with other skincare products, enhancing the overall effectiveness of your routine. Using a face serum regularly can contribute to a more vibrant and youthful complexion by providing targeted nourishment to the deeper layers of your skin.

MARKETED PRODUCTS

- 1) **Jovees Herbal Face Serum** - The jovees herbal serum revives dull skin and improve its texture and brightness. With this lightweight you can combat the fine lines of ageing. It is rich in vitamin c and natural fruits, making your skin young penetrates your skin to provide nourishment and a glow. Your skins hydration is greatly aided by the serum's inclusion of grape seed extract. It reduces hyperpigmentation and black spots on your skin.



- 2) **TruSkin Natural Vitamins C Serum for Face** – The serum has a potent anti-ageing composition best suited for eradicating wrinkles, fine lines, and other facial symptoms





CONCLUSION

Herbal face serums are popular for their natural ingredients and potential benefits for skin health. However, individual experiences may vary, and it's essential to choose products based on your skin type and specific needs. Always patch-test new products and consult with a dermatologist if you have concerns about potential allergens or sensitivities.

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LEARNING STYLES AND MATHEMATICAL DISPOSITIONS AS PREDICTORS OF THE CRITICAL THINKING SKILLS OF JUNIOR HIGH SCHOOL STUDENTS

Elmer S. Morial¹, Emmanuel P. Abuzo²

Department of Education, Kapalong National High School, Kapalong, Davao del Norte, Philippines¹

Graduate Education, St. Mary's College of Tagum, Inc., Tagum City, Davao del Norte, Philippines¹

Department of Education, Sawata National High School, San Isidro, Davao del Norte, Philippines²

Article DOI: <https://doi.org/10.36713/epra16232>

DOI No: 10.36713/epra16232

ABSTRACT

The primary purpose of this study is to determine whether learning styles and mathematical dispositions predict students' critical thinking skills. This study employed a descriptive and correlational research approach. Using stratified random sampling, 271 grade 10 students were selected as respondents from six public secondary schools in Kapalong East District, Davao del Norte Division during the school year 2022-2023. Furthermore, this study employed two adapted survey questionnaires and one researcher-made questionnaire, all of which were validated to collect data and treated using mean, standard deviation, Spearman's Rank Correlation Coefficient, and regression analysis. The findings showed that the learning styles among the students are high, their mathematical dispositions are moderate, and their critical thinking skills are low. The findings also revealed that learning styles has a positive significant relationship and influence on students' critical thinking skills in mathematics. However, students' mathematical dispositions have an inverse relationship and influence to their critical thinking skills in mathematics. These findings underscore the importance of nurturing critical thinking skills among students. It is recommended that teachers and DepEd officials collaborate to create interventions aimed at enhancing students' critical thinking skills. Furthermore, replication studies across diverse contexts are advised to validate the longevity of these relationships and further advance our comprehension of the subject matter.

KEYWORDS: Learning styles, mathematical dispositions, critical thinking skills, grade 10 students, descriptive-correlational approach, regression analysis, Kapalong East District, Davao del Norte.

BACKGROUND OF THE STUDY

Critical thinking skills of students in solving word problems in mathematics have become a challenge among teachers (Ginanjar et al., 2019). This is because students struggled to comprehend the significance of the presented problem situations, which hindered their ability to generate solutions (Baumanns, 2022). According to Purwanto et al. (2020), the various learning styles of students in a classroom pose a challenge for teachers to stimulate critical thinking skills among their students. Moreover, students with unfavorable dispositions toward mathematics have difficulty answering tasks requiring critical thinking skills (Susilo et al., 2020). This means that students need to improve their ability to think critically before they can solve math problems well (Lestari et al., 2021).

In Indonesia, current teaching and learning in mathematics subjects are still unable to effectively enhance the critical thinking skills of students (Munawaroh et al., 2018). In Semarang, Indonesia, only 21% of elementary students answered critical thinking exercises correctly, indicating insufficient skill development (Lestari et al., 2021).

Additionally, the Trends in International Mathematics and Science Study (TIMSS) 2019 report highlights low critical thinking scores among Pakistani students, suggesting inadequate guidance in applying conceptual understanding to problem-solving (Mullis et al., 2020; Afrida et al., 2019).

In the Philippines, Benedicto and Andrade (2022) pointed out that a contributing factor to the underperformance of the country in mathematics is the insufficient development of critical thinking skills among students. According to TIMSS 2019, the Philippines averaged 297, below the low benchmark score, indicating a lack of ability to apply understanding to critical-thinking-required math problems (Mullis et al., 2020). Students' struggles with critical thinking result in inadequate information processing, leading to incorrect or incomplete problem-solving (Brazel, 2022).

Moreover, in one of the schools of the Division of Davao del Norte, a problem with critical thinking skills in mathematics has been observed among students. According to the School District Consolidated Proficiency Level Report in Mathematics for the school year 2021-2022, the test scores of the Grade 10



students in the school only have a proficiency level of 75.97%, which is considered the lowest among the other subjects. Most of the students cannot solve real-life mathematics applications and problems. Thus, students have poor performance on items that require critical thinking.

Several studies establish links between learning styles and critical thinking skills (Erdoğan, 2020), as well as mathematical disposition and critical thinking (Celik & Ozdemir, 2020). Efforts to enhance critical thinking in students include various approaches like learning devices, interactive questions, problem-based learning, and chronotype variations (Afdareza et al., 2020; Monrat et al., 2022; Amin et al., 2020; Lopez III, 2022). This study aimed to explore connections between learning styles, mathematical dispositions, and critical thinking skills in mathematics, prompted by pandemic-related challenges. It addressed a gap in research, aiming to foster empirical evidence to promote critical thinking skills in mathematics among Grade 10 students in Davao del Norte Division.

The study addresses the pressing issue of students' critical thinking skills in mathematics, exacerbated by the ongoing pandemic. It investigates whether learning styles and mathematical dispositions can predict these skills, aiming to provide the Department of Education with strategies for improvement. Results will be disseminated widely, including through the School and District Congress, the School Learning Action Cell (SLAC), seminars, and publications.

STATEMENT OF THE PROBLEM

The main purpose of the study is to determine if learning styles and mathematical dispositions significantly predict the critical thinking skills of Grade 10 students in the Kapalong East District.

Specifically, this sought to answer the following questions:

1. What is the level of learning styles of the students in terms of:
 - 1.1. study activities;
 - 1.2. study motives; and
 - 1.3. study views?
2. What is the level of mathematical dispositions of the students in terms of:
 - 2.1. confidence;
 - 2.2. cognitive disposition; and
 - 2.3. affective disposition?
3. What is the level of critical thinking skills of the students in terms of:
 - 3.1. interpretation;
 - 3.2. analysis;
 - 3.3. evaluation; and
 - 3.4. inference?
4. Is there a significant relationship between:
 - 4.1. learning styles and critical thinking skills of students?
 - 4.2. mathematical dispositions and critical thinking skills of students?

5. Do learning styles and mathematical dispositions significantly predict the critical thinking skills of the students?

METHODOLOGY

RESEARCH DESIGN

The study utilized a quantitative research design, employing both descriptive and correlational approaches to collect and analyze numerical data. Quantitative research aims to discern trends, predict outcomes, analyze causal relationships, and generalize findings to broader populations by gathering data from specific samples and addressing population sample issues. Descriptive research focuses on methodically describing populations, events, or phenomena, providing an overview of current ideas or behaviors, while correlational research identifies relationships between variables and forecasts future events based on present information, assessing the strength of associations between variables.

In this study, the descriptive design facilitated data collection without altering variables, summarizing students' learning styles, mathematical dispositions, and critical thinking skills, while the correlational design allowed for statistical analysis to determine the strength and direction of relationships between these variables. The study aimed to explain current variable levels, assess statistical linkages, and evaluate whether learning styles and mathematical dispositions predict students' critical thinking skills, making the combination of descriptive and correlational quantitative research approaches suitable for its objectives.

STATISTICAL TREATMENT OF DATA

The analysis and interpretation employed the following statistical tools:

Mean. This was used to determine the students' levels of learning styles, mathematical dispositions, and critical thinking skills.

Standard Deviation. This refers to a statistical measurement that quantifies the extent of dispersion within a dataset in relation to its mean value. This method of analysis was employed to ascertain the proximity or distance of the scores from the mean.

Spearman's Rank Correlation Coefficient. This was utilized to determine the correlation strength among variables having non-normal distribution of data. This was employed to answer specific research queries.

Multiple Regression Analysis. This tool includes a collection of statistical methods used to ascertain the relationships between one or more independent variables and dependent variables. This was employed to ascertain the extent to which independent variables exhibit a statistically significant influence on the dependent variable.

RESEARCH RESPONDENTS

The study's respondents were the Grade 10 students enrolled in the six public secondary schools in Kapalong East District, Davao del Norte Division, during the 2022–2023 school year.



The total number of grade 10 students was 911, including 580 in School A, 91 in School B, 47 in School C, 65 in School D, 83 in School E, and 45 in School F. Using the Raosoft Sample Size Calculator with a 95% confidence level (Z-Score = 1.96) and a 5% margin of error, a sample size of 271 respondents was determined. The sample consisted of 173 students from School A, 27 students from School B, 14 students from School C, 19 students from School D, 25 students from School E, and 13 students from School F.

Furthermore, respondents were drawn from the strata of the six secondary schools using a stratified random sampling technique. This study also employed simple random sampling to choose respondents from each stratum. The researcher used a Microsoft Excel random name generator to select the respondents from the list of Grade 10 students.

Moreover, the school gatekeepers distributed a printed letter directly to each individual, enlisting them as respondents. Furthermore, the researcher made sure to obtain parental consent for the voluntary involvement of the research respondents in this study.

RESULTS AND DISCUSSION

The following are the results of the study.

Table 1

Summary on the Level of Learning Styles in Mathematics

Indicators	Mean	SD	Description
Study Activities	3.88	0.56	High
Study Motives	3.46	0.72	High
Study Views	3.85	0.64	High
Overall Mean	3.73	0.51	High

The overall mean level of students' learning styles in mathematics is 3.73, signifying a high descriptive equivalent and manifesting their learning styles. With a standard deviation of 0.51 indicating minimal variability, responses suggest coherence, positive experiences, high-level study approaches, and favorable attitudes, likely fostering academic success and deeper engagement with mathematics.

The findings align with Tossavainen et al.'s (2020) proposition, showing students possess a high level of learning styles, indicating positive attitudes and active engagement in studies. Rashidov (2020) suggested students with high levels of learning styles contribute to generating new ideas, enhancing their ability to apply knowledge in mathematics effectively. Mazana et al.'s (2019) study supports prioritizing learning styles in mathematics education to enhance enjoyment and academic performance.

Table 2

Summary on the Level of Mathematical Dispositions

Indicators	Mean	SD	Description
Confidence	3.15	0.44	Moderate
Cognitive Disposition	3.38	0.58	Moderate
Affective Disposition	3.17	0.36	Moderate
Overall Mean	3.24	0.33	Moderate

The overall mean score obtained by students in terms of their mathematical dispositions was 3.24. This suggests that their mathematical dispositions are somewhat evident, with a consistent standard deviation of 0.33. Students display moderate confidence, cognitive disposition, and affective disposition, influencing their engagement and problem-solving abilities while maintaining a balanced disposition towards mathematics.

Moreover, Hutajulu, Wijaya, and Hidayat (2019) found that students generally have moderate mathematical dispositions, indicating a willingness to participate in various mathematical tasks and solve simpler problems effectively, but they may face challenges with more complex mathematical applications. Similarly, Yaniawati et al. (2019) observed a moderate level of mathematical disposition among students, who actively seek alternative approaches and engage in reflective thinking about their problem-solving methods. Consequently, it's crucial for educators to cultivate students' mathematical attitudes in the classroom setting.

Table 3

Level of Critical Thinking Skills of Students

Indicators	Mean	SD	Description
Interpretation	26.73	22.97	Low
Analysis	27.53	31.35	Low
Evaluation	19.79	23.35	Very Low
Inference	19.26	17.07	Very Low
Overall Mean	23.33	20.15	Low

The overall mean of critical thinking skills among students is 23.33, indicating a low descriptive equivalent. This means that the critical thinking skills of students are fair. The standard deviation of 20.15 suggests variability around this mean. Additionally, students display inconsistency in their responses, facing challenges in interpreting, analyzing, evaluating, and inferring mathematical problems, which can hinder decision-making and problem-solving abilities, potentially impacting academic achievement and proficiency in tackling complex problems.

Moreover, Basri et al. (2019) found junior high students' critical thinking skills were low, resulting in low problem-solving and decision-making abilities. Conversely, Siburian et al. (2019) emphasized the importance of enhancing students' critical thinking within instructional contexts, linking it to proficient problem-solving skills. These findings stress the need for targeted educational interventions to improve critical thinking skills.

Table 4

Significant Relationship Between Learning Styles and Mathematical Dispositions Towards Critical Thinking Skills of Students

Independent Variables	ρ	p-value	Decision on H_0	Decision on Relationship
Learning Styles	0.140	0.021	Reject	Significant
Mathematical Dispositions	-	0.000	Reject	Significant



Table 4 illustrates correlations between students' learning styles, mathematical dispositions, and critical thinking skills. It reveals a significant positive correlation between learning styles and critical thinking skills ($p < 0.05$), rejecting the null hypothesis. Spearman's rank correlation coefficient (ρ) of 0.140 supports this, indicating higher learning styles correspond to higher critical thinking skills. Conversely, there's a significant negative relationship between mathematical dispositions and critical thinking skills ($p < 0.05$), with a ρ -value of -0.227 indicating higher mathematical dispositions are associated with lower critical thinking skills. Addressing learning styles is crucial to enhancing students' critical thinking skills in mathematics.

The findings corroborate Maknun's (2020) study, showing a positive correlation between learning styles and critical thinking skills. Adnan et al. (2023) discovered that diverse learning activities enhance students' critical thinking skills, a sentiment echoed by Hamidah et al. (2019), who emphasized the importance of improving learning styles to enhance mathematical problem-solving abilities. Conversely, Güner and Gökçe (2021) found a negative relationship between students' mathematical dispositions and critical thinking skills, although Widana (2022) contested this, suggesting a positive correlation. Susilo et al. (2020) observed that positive attitudes towards mathematics don't guarantee high-level critical thinking, highlighting the need for tailored educational approaches to nurture both positive attitudes and robust critical thinking skills.

Table 5
Regression Analysis of the Learning Styles and Mathematical Dispositions Towards Critical Thinking Skills

Independent Variables	Unstandardized Coefficients	Standardized Coefficients	t	p-value	Remarks
	B	Std. Error			
(Constant)	32.1	10.67	3.01	0.003	Significant
Leaning Styles	7.95	2.28	3.49	0.000	Significant
Mathematical Dispositions	-11.92	2.8	-4.26	0.000	Significant
R = 0.288		R square = 0.083		p= 0.000	

Table 11 shows that the regression analysis delves into the influence of learning styles and mathematical dispositions on critical thinking skills. Data transformation normalized the distribution, validated by a Shapiro-Wilk value of 0.053 surpassing 0.05. The coefficient of determination (R square) at 0.083 suggests the model predicts 8.3% of critical thinking skill variability in Grade 10 students. A high coefficient of alienation (91.7%) implies other factors may explain the remaining variability. The beta coefficient ($\beta = 7.95$) indicates a positive association between learning styles and critical thinking skills, while $\beta = -11.92$ suggests an inverse relationship between mathematical dispositions and critical thinking skills. Statistical analysis rejects the null hypothesis, affirming that learning styles and mathematical dispositions significantly predict students' critical thinking skills in mathematics.

Arisoy and Aybek's (2021) research underscores the significant positive impact of learning styles on students' critical thinking skills in mathematics. Minarti et al. (2020) also highlighted the pivotal role of mathematical dispositions in shaping students' critical thinking skills and influencing their interpretation and analysis of mathematical problems. Conversely, Güner and Gökçe (2021) and Palavan (2020) reveal inverse relationships between mathematical dispositions and critical thinking skills, necessitating alternative approaches to foster critical thinking proficiency in educational settings.

RECOMMENDATIONS

The following suggestions are made in light of the data and conclusions presented.

The study's findings and conclusions lead to the following recommendations:

1. Students might participate in a variety of learning activities to enhance their critical thinking skills. Active participation in challenging problem-solving tasks helps develop resilience and a positive attitude towards math. Integrating these methods in teaching and learning enables critical thinking, diverse perspective exploration, and effective problem-solving skills essential for mathematics success.
2. Teachers might promote the development of critical thinking skills in students by first assessing their learning styles and mathematical dispositions through various activities or assessments. Adapting teaching methods to match these styles enhances learning. Establishing a nurturing educational environment focused on personal growth encourages applying critical thinking in practical scenarios and supports interdisciplinary learning to accommodate diverse mathematical attitudes.
3. The Department of Education might implement policies promoting teacher training programs that incorporate modules on diverse learning styles and mathematical dispositions. Additionally, they might support the development of educational materials catering to different learning modalities, fostering a flexible framework for cultivating critical thinking skills across diverse student populations.
4. Future researchers might focus on conducting extensive studies to better understand the complex interplay between learning styles, mathematical dispositions, and critical thinking skills, offering insights into effective strategies for tailored education. They may also



investigate how emerging technologies and innovative teaching methods can personalize learning, cater to individual preferences, and expedite critical thinking skill development.

CONCLUSIONS

Based on the findings of the study, the subsequent conclusions have been derived:

1. The learning styles of the Grade 10 students are manifested.
2. The mathematical dispositions of the Grade 10 students are somewhat evident.
3. The critical thinking skills of the Grade 10 students is fair.
4. There is a significant relationship between learning styles and critical thinking skills, and mathematical dispositions and critical thinking skills of the students.
5. Learning styles and mathematical dispositions significantly predict the critical thinking skills of the students.

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A STUDY ON TRENDS AND GROWTH OF PUBLIC AND PRIVATE SCHOOL EDUCATION IN KARNATAKA

Umesha K¹, Dr. Mahesha M²

¹Research Scholar, Dos in Economics and Co-Operation, Manasagangotri, University of Mysore, Mysore

²Professor, Dos in Economics and Co-Operation, Manasagangotri, University of Mysore, Mysore

Article DOI: <https://doi.org/10.36713/epra16240>

DOI No: 10.36713/epra16240

ABSTRACT

This paper attempts to analyse the trends and growth of Public and Private School Education in Karnataka. For this purpose the study taken the time period between 2012-13 to 2021-22 from UDISE+ reports. The study found that the numbers of government primary schools are decreased from 22,897 to 20,903 in 2012-13 to 2021-22. For private aided primary schools the same trend is also observed they decreased from 245 to 195 in study period. The private unaided schools are also decreased from 3769 to 3226 during the study period. But the numbers of government primary schools are decreased higher compare to private aided and unaided schools and also found that the numbers of government upper primary schools are decreased in study period. In private aided Upper primary schools are decreased from 70 to 46, in study period. The private unaided schools are also decreased from 286 to 123 from 2012-13 to 2021-22. But the number of government Upper primary schools are decreased higher when compare to private aided and unaided schools.

KEY NOTES: Schools, Enrolments

INTRODUCTION

Education is one of the important socio-economic indicators of development of the country. Education contributes to economic growth through consumption, saving, investment and distribution aspect. It enhances the quality of life of the people in the country through increase in life-time earnings (Sanjay Kumar 2020).

Indian school education system is one of the biggest and most significant education systems in the global after China, while catering to over 260 million young person's every year. Initial expansion of the education sector has limited by India's economic growth but continued steadily in the 20th century. Since, committing to the Millennium Development Goals in 2000. India has made great progress towards achieving universal primary education. As per the Reports of World Bank during the period between 2000 and 2017, elementary school enrolment increased by more than 33 million from 156.6 million in 2000-01 to 189.9 million in 2017-18. While achievement varies greatly between India's 29 states and seven union territories, two thirds of these have claimed to have progressed universal primary enrolment. Two prominent initiatives of the Indian Government, Sarva Shiksha Abhiyan (SSA – 'Education for All Campaign' in Hindi) in 2001 and the Right of Children to Free and Compulsory Education (RTE) Act, 2009, have promoted greater foci on issues of access, inclusivity and quality in education. The mean years of schooling of the working population, increased from 4.19 years in 2000 to 6.4 years in 2017. India has also devoted to the achievement of the UN Sustainable Development Goals; with the initiation of several further large-scale and ambitious

schemes in current years to help achieve these objectives (Sharma, R., & Ramachandran-2009).

An Overview of School Education in Karnataka:

Education segment is creating significant growth in Karnataka. As per 2001 Census, literacy rate was 66.64 percent, which increased to 75.60 percent in 2011. Presently, Karnataka is ranked 9th overall in the literacy rate, the literary growth plans reveal the prospects for the sustainable education. In Karnataka, school education is consisted of Lower Primary Schools (class I to V), Higher Primary Schools (class I to VII / VIII), and High Schools (VIII to X). According to the Education Department, it is evidence from that the elementary education is substantial with 83.14 per cent of the lower and 60.86 percent higher primary schools being achieved. However, department's participation is low in secondary education with only 29.59 percent of the high schools being managed by the Government. While the Government schools are mainly located in rural areas, private schools are largely urban based. There are 62319 elementary schools in the State of which 24316 are lower primary school and 38003 are higher primary school during 2019-20 (Karnataka School Education Department Reports).

The very recent and emerging trends of the primary education system in Karnataka show that the Enrollments of government schools have come down, Even though the Government expenditure on various schemes to promote Universalisation of Elementary Education (UEE) has been increasing in every consecutive year, these schemes are not fulfilling the Government's aim to improve Enrollment and retention rate. On the other hand, private schools have become synonymous



with a quality education that is leading to an increase in the number and the Enrollments of private schools and is causing the shutdown of government schools. (Deepmala Yadav & Suma Singh, 2020).

METHODOLOGY

The objective of the present study is to gain insight into the trends in growth of public and private schools education in Karnataka state.

The study has used secondary data. The secondary sources of data have been collected from Unified District Information System of Education (UDISE+), Economic Survey of

Karnataka 2022-23, Karnataka School Education Reports and websites.

In order to examine the objective of the study, the collected data have been analysed by using tables, graphs and ANOVA techniques.

RESULT AND DISCUSSION

This section discuss about trends in school education at state level, for this purpose two important indicator have been selected for the analysis. They are number of primary and upper primary schools and primary and upper primary school enrolments.

Table-1: Trends in Number of Primary Schools in Karnataka

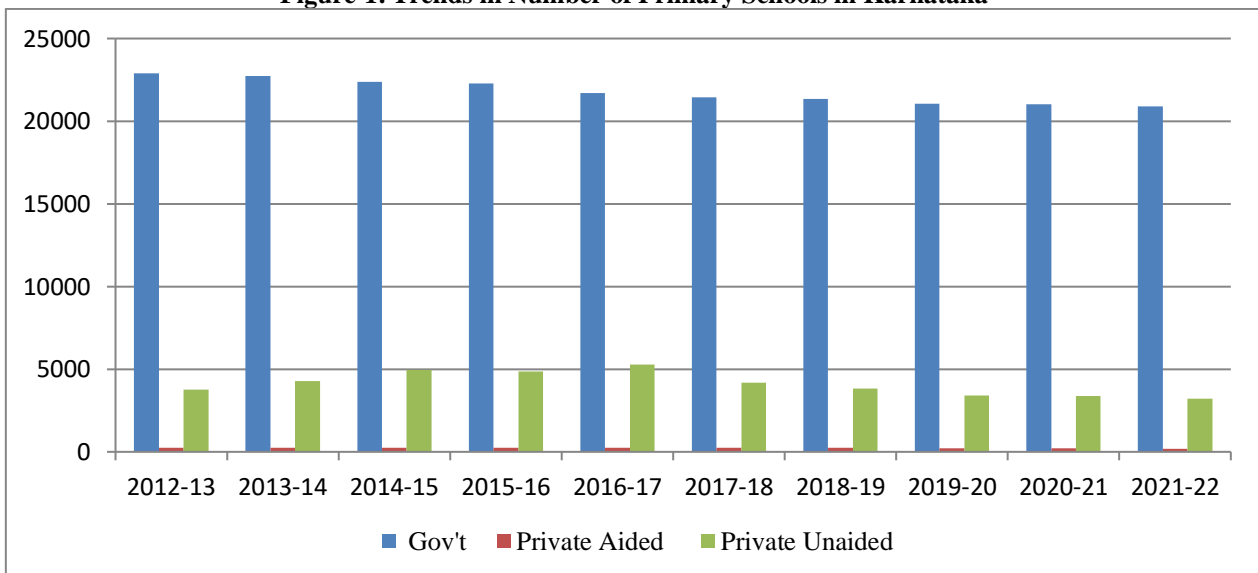
Year	Government	Private Aided	Private Unaided
2012-13	22897	245	3769
2013-14	22728	242	4295
2014-15	22392	240	4957
2015-16	22285	240	4860
2016-17	21715	237	5267
2017-18	21442	233	4169
2018-19	21352	235	3814
2019-20	21061	206	3409
2020-21	21011	201	3383
2021-22	20903	195	3226

Source: UDISE+

The Table-1 clearly shows the trends in Government, Private Aided and Private Unaided primary schools in Karnataka for the period of 2012-13 to 2021-22. The numbers of government primary schools are decreased from 22897 to 20903 in study period. The private aided primary schools are continuously decreased from 245 to 195, during the study period. Whereas the private unaided schools are increased from 3769 in 2012-13

to 5267 in 2016-17. But thereafter it is observed that decreased to 3226 in the year 2021-22. But the number of government primary schools are decreased higher when compare to private aided and unaided schools. The figure-1 depicts the same trends in total number of governments, private aided and unaided schools of primary schools in Karnataka from 2012-13 to 2021-22.

Figure-1: Trends in Number of Primary Schools in Karnataka



Source: UDISE+



Table-2: Trends in Number of Upper Primary Schools in Karnataka

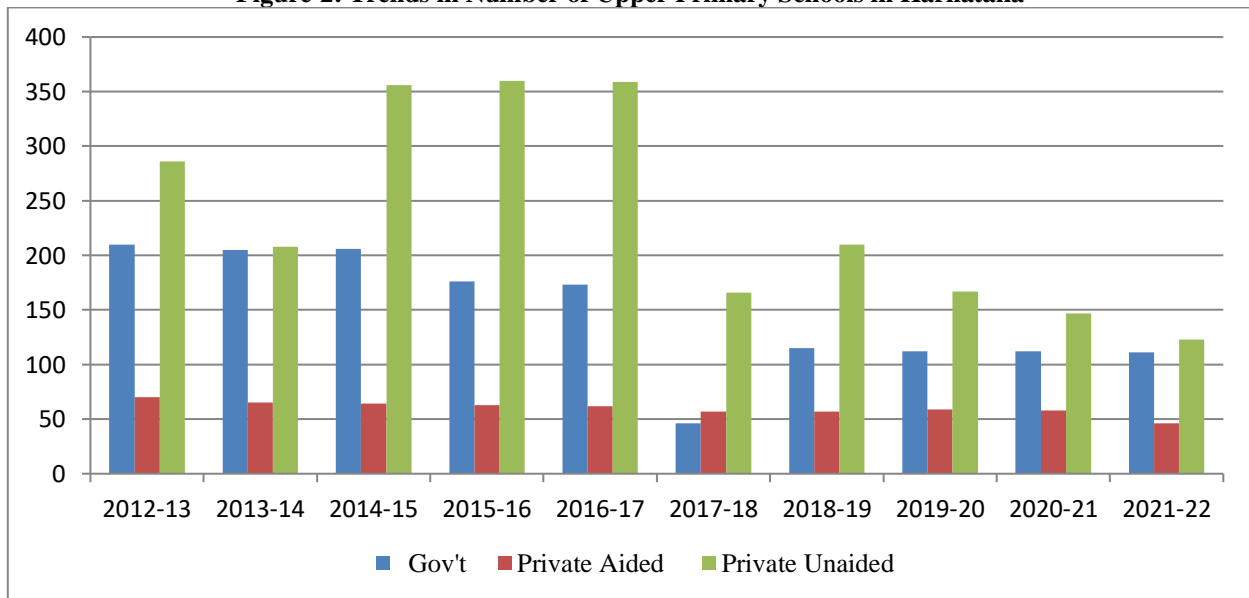
Year	Government	Private Aided	Private Unaided
2012-13	210	70	286
2013-14	205	65	208
2014-15	206	64	356
2015-16	176	63	360
2016-17	173	62	359
2017-18	46	57	166
2018-19	115	57	210
2019-20	112	59	167
2020-21	112	58	147
2021-22	111	46	123

Source: UDISE+

The Table-2 reveal about trends in total number of Government, Private Aided and Private Unaided upper primary schools in Karnataka from the period of 2012-13 to 2021-22. The numbers of government upper primary schools are decreased from 210 to 111 in study period. The private aided upper primary schools are decreased from 70 to 46, in study period. The private

unaided schools are also decreased from 286 to 123 from 2012-13 to 2021-22. But the number of government upper primary schools are decreased higher when compare to private aided and unaided schools. The figure-2 shows the graphical representation of total number of governments, private aided and unaided upper primary schools in Karnataka.

Figure-2: Trends in Number of Upper Primary Schools in Karnataka



Source: UDISE+

Table-3: Trends in Primary School Enrolment in Karnataka

Year	Government	Private Aided	Private Unaided
2012-13	730951	29222	312310
2013-14	721759	31421	432166
2014-15	701626	28483	525195
2015-16	684781	27105	536855
2016-17	672847	23647	503604
2017-18	613929	21897	284233
2018-19	594080	22729	346693
2019-20	566587	22015	317792
2020-21	578524	20908	281144
2021-22	614060	21030	251150

Source: UDISE+

Trends in primary school enrolment in Karnataka is reported in the Table-3 Results reveal that there is a steady decline in enrolment in the government primary school but only in last year of the study 2021-22, there is an increase in the enrolment

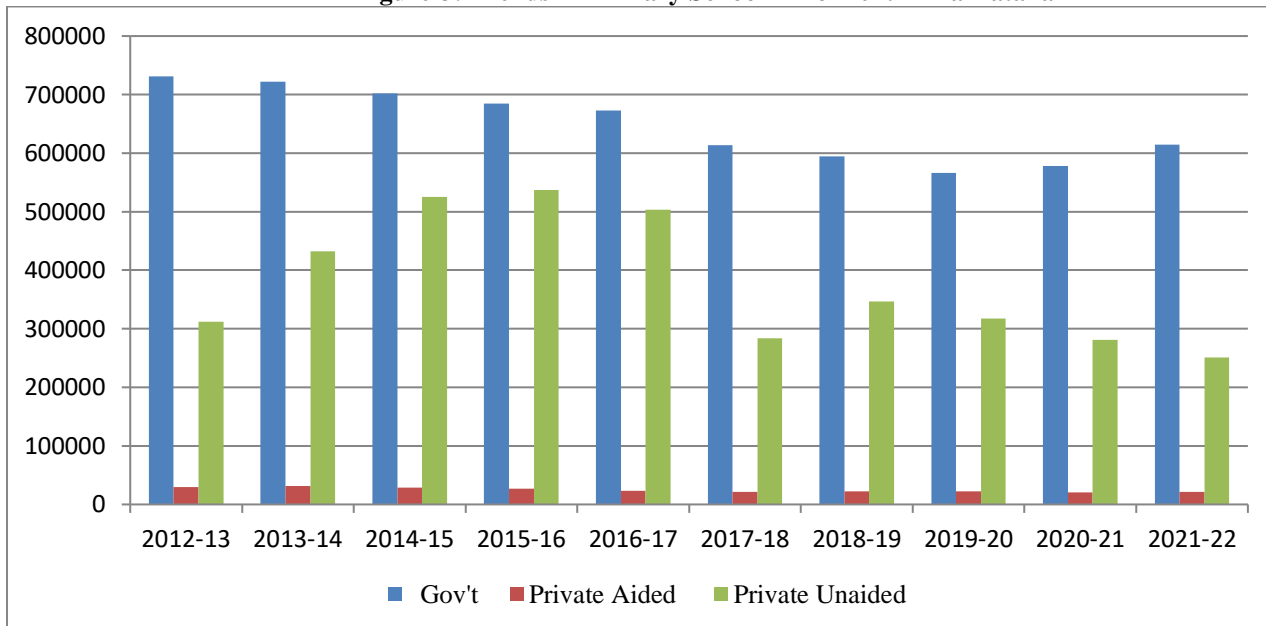
2020-21 to 2021-22 is value of 578524 and 614060 respectively the reasons for increase in enrolment in the last two years of the study is due to covid-19 pandemic.



Almost the same trend is observed in enrolment of private aided school. But whereas for private unaided school's enrolment has been increased for first five years period of the study. There after enrolment has been decreased. The rates of enrolment in

private unaided schools are very low during the covid-19 period due to because of job loss and other effects of covid-19 pandemic.

Figure-3: Trends in Primary School Enrolment in Karnataka



Source: UDISE+

Table-4: Trends in Upper Primary School Enrolment in Karnataka:

Year	Government	Private Aided	Private Unaided
2012-13	26645	7453	11978
2013-14	31795	6106	18641
2014-15	35061	6924	29597
2015-16	26030	6855	29288
2016-17	26155	5824	30571
2017-18	12407	4757	9054
2018-19	10942	4917	13805
2019-20	10562	5234	11910
2020-21	9964	4758	9552
2021-22	9807	2580	7273

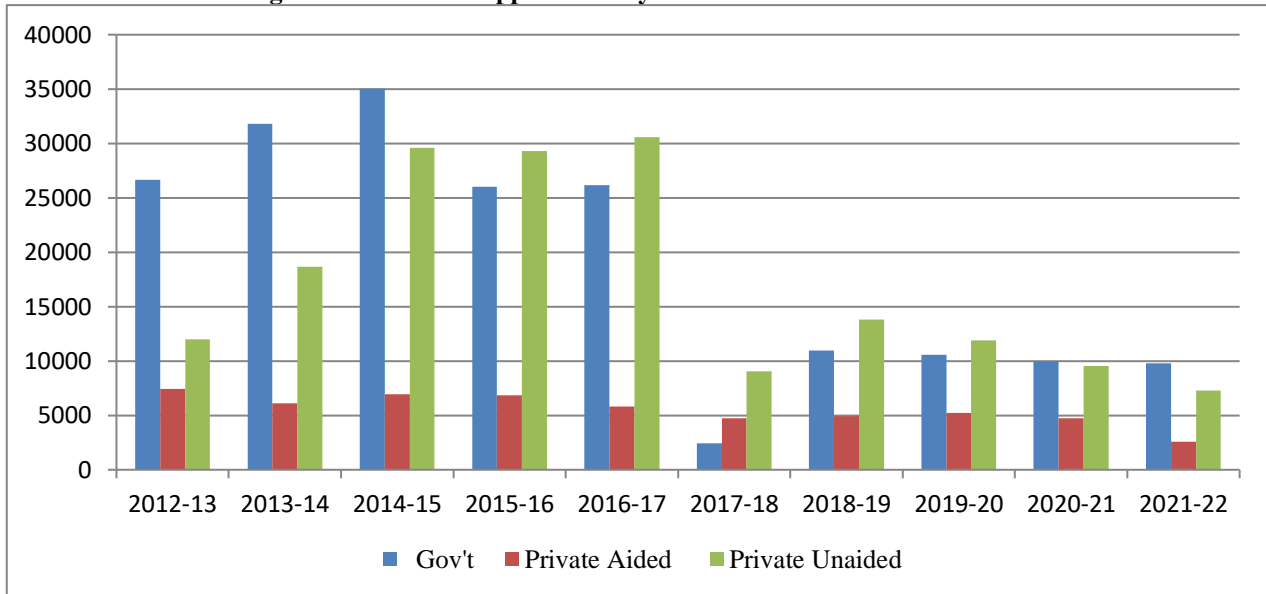
Source: UDISE+

The Table-4 represents the total number of enrolment in government, private aided and private unaided schools from the period of 2012-13 to 2021-22. The total number of enrolments in government upper primary schools was increased from 2012-13 to 2016-17, but from the academic year 2017-18 to 2021-22 enrolments in government upper primary schools decreased from 12407 to 9807. In private aided schools the number of enrolments are continuously decreased from

7453 to 2580 from 2012-13 to 2021-22. The enrolment in Private unaided upper primary schools for the first five years was increased but after 2017-18 it was decreased. The figure-4 show graphical representation of the upper primary school's enrolments of government, private aided and unaided schools in Karnataka in the study period.



Figure-4: Trends in Upper Primary School Enrolment in Karnataka:



Source: UDISE+

Table-5: ANOVA Results for Number of Schools and Enrolment among Government, Private Aided and Private Unaided Schools in Karnataka:

One Way ANOVA						
Type of Schools	Groups	Sum of Squares	df	Mean Square	F	Sig.
No of Primary School	Between Groups	2638577251.267	2	1319288625.633	3702.947	.000
	Within Groups	9619579.700	27	356280.730		
	Total	2648196830.967	29			
No of Upper Primary School	Between Groups	158641.400	2	79320.700	20.045	.000
	Within Groups	106840.900	27	3957.070		
	Total	265482.300	29			
Primary School Enrollment	Between Groups	1953247741773.267	2	976623870886.633	184.708	.000
	Within Groups	142759423786.100	27	5287386066.152		
	Total	2096007165559.367	29			
Upper Primary School Enrollment	Between Groups	1059171877.400	2	529585938.700	7.343	.003
	Within Groups	1947309866.100	27	72122587.633		
	Total	3006481743.500	29			

Source: Compiled by author

The results of ANOVA for number schools and enrolment across government, private aided and private unaided school are presented in the Table-5.

Results reveal that there is a significant difference in number of schools both in primary and upper primary schools among the three management types. This can be observed from calculated values of 'F' reported in the table, 3702.947 and 20.045 respectively and the 'P' value for number of the schools are 0.000 and 0.000 respectively, indicating difference is statistically significant at 1 % level. From these results it is observed that the average numbers of primary and upper primary schools are different among three management schools.

Results in the Table-5 also show that there is significant difference in number of Enrolment both in primary and upper primary schools among the three management types. This can be observed from calculated values of 'F' reported in the table, 184.708 and 7.343 respectively and the 'P' value for number of the schools are 0.000 and 0.003 respectively, indicating difference is statistically significant at 1 % level.

From these results it is observed that the average numbers of primary and upper primary school enrolment are different among three management schools.



Table-6: Results of Post Hoc Tests:

Type of Schools	Subset for alpha = 0.05				
	Variable	N	1	2	3
Primary School	Private Aided	10	227.4000		
	Private Unaided	10		4114.9000	
	Government	10			21778.6000
	Sig.		1.000	1.000	1.000
Upper Primary School	Private Aided	10	60.1000		
	Government	10		146.6000	
	Private Unaided	10			238.2000
	Sig.		1.000	1.000	1.000
Primary Enrollment	Private Aided	10	24845.7000		
	Private Unaided	10		379114.2000	
	Government	10			647914.4000
	Sig.		1.000	1.000	1.000
Upper Primary Enrollment	Private Aided	10	5540.8000		
	Private Unaided	10		17166.9000	
	Government	10		18936.8000	
	Sig.		1.000	.645	

Source: Compiled by author

The results of post hoc test are reported in Table-6 the results depict that number of schools both in primary and upper primary section and also the Enrolment in primary schools among the three management types are statistically different. Which implies that the average number of schools during the study period among the three types management are different, But the Enrolment in upper primary schools indicate, there is no difference in Enrolment between private unaided and government school. But private aided schools are having lower Enrolment.

CONCLUSION

The purpose of the study was to analyse the trends in number of schools and enrolment is primary and upper primary schools in Karnataka by divided the schools in to government, private aided and private unaided.

The study found that the numbers of government primary schools are decreased. Private aided and unaided schools also decreased during the study period. But compare to aided and unaided schools. Government schools were decreased more. Further, Upper primary private unaided schools are more compare government and private aided in study period. It is also found that there is a fluctuating trend in enrolment of both government and private unaided schools. The difference in number of schools and enrolment are statistically significant across government, private aided and unaided schools as observed in ANOVA results. In whole the study found that in all types of management both number of school and enrolment have shown a decreasing trend. The main reason might be increase in CBSE School.

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THE RELATIONSHIP OF BACK FITNESS, MUSCLE STRENGTH ARM AND HAND STRIP ON THE SPEED OF THE O GOSHI TECHNIQUE IN JUDO ATHLETES IN BANDAR LAMPUNG

Aldo Krisdiantoro¹, Hari Yulianto², Dawam Ashidiqie³

^{1,2,3}Departement of Health and Sports Science, Yogyakarta State University, Yogyakarta, Indonesia

Article DOI: <https://doi.org/10.36713/epra16234>

DOI No: 10.36713/epra16234

ABSTRACT

This study aims to determine how the relationship between back flexibility, arm muscle strength and grip to the speed of o goshi technique strikes on judo athletes in judo bandar lampung. Data retrieval using method descriptive correlational. The sample is 30 people with data collection technique Total Sampling. The data analysis technique uses Normality Test, Homogeneity Test, Linearity Test and Correlation Product Moment. The results showed that (1) the flexibility of the back muscles gave a relationship to the throw speed of the technique O Goshi by 31.3%, (2) the strength of the arm muscles give a relationship to the throw speed of the technique O Goshi by 48.5%, and (3) Grip hand give a relationship to the speed of dings technique O Goshi by 37.0%. While back muscle flexibility, arm muscle strength, and hand grip give a relationship of 64.6% to the slam speed of the technique O Goshi. From the results of this study, it can be concluded that back flexibility, arm muscle strength and hand grip contribute to the kicking speed of the technique O Goshi, and the biggest contribution to the kicking speed of the technique O Goshi is the arm muscle strength of 48.5%.

KEYWORDS: Speed, Muscle Strength, Flexibility, Technique O Goshi.

INTRODUCTION

The definition of judo is a branch of martial arts that originates from Japan and has become a popular sport today, Kadir (2013). Judo is a competitive sport that relies on good back flexibility and arm muscle strength to throw. The development of Judo sport development in Indonesia is very rapid, which can be seen from the many regional and national level championships held in Indonesia. As well as many clubs Judo in colleges and schools.

There are several throwing techniques in judo that judo players must learn, judo throwing techniques, namely:

1. Te-Waza (hand throwing or slamming technique).
2. Koshi-Waza (throwing or slamming technique with the pelvis).
3. Ashi-Waza (throwing or slamming technique with the feet).
4. Sutemi-Waza (throwing or slamming technique by dropping yourself).
5. Yoko-Sutemi-Waza (throwing or slamming technique by throwing yourself to the side).

The O Goshi throwing technique is a throwing technique with the whole hip (large Hip Throw). Researchers will specialize in research on the relationship between back flexibility, arm muscle strength and hand grip on throwing speed in the O Goshi technique in Bandar Lampung Judo Athletes aged 16-20 years. Based on observations, researchers saw that several judo athletes from Bandar Lampung when competing were athletes who used the O Goshi throwing technique. Researchers

looking during randori found a judo player throwing a kick using the O Goshi technique and producing an ippon. Therefore, researchers tried to examine what physical factors support the success of this technique so as to produce a perfect kick.

METHODOLOGY

In this research, researchers used descriptive correlational research methods. This method was used because this research is related to information parables that describe existing symptoms. Especially regarding the relationship between back flexibility, arm muscle strength and hand grip strength on the speed of the O Goshi kick in Bandar Lampung judo athletes aged 16-20 years. Correlation research is research to determine the relationship and level of relationship between two or more variables without any attempt to influence these variables so that there is no variable manipulation, Frankel and Wallen (2008). The existence of relationships and levels of these variables is important because by knowing the level of relationships that exist, researchers will be able to develop them in accordance with the research objectives.

Population is an area consisting of objects that have certain quantities and characteristics determined by researchers to be studied and the possibility of drawing conclusions. The population in this study was 30 Bandar Lampung Judo athletes (Sugiyono et al., 1992). The sample is a part or representative of the population studied, Arikunto et al. 2010). To determine the sample size if the subjects are less than 100 is better to take all. Furthermore, if the number of subjects is large, between 10



– 15% or 20 – 25% or more can be taken. In this research, the sampling method is by total sampling, namely including all individuals or members of the population as samples, (Arikunto et al., 2010). The sample in this study was 30 Bandar Lampung judoka using a total sampling technique.

A research variable is an attribute or trait or value of a person, object or activity that has certain variations determined by the researcher to be studied and then conclusions drawn, (Sugiyono et al., 2017).

In this research the variables consist of:

Independent Variable

An independent variable is a variable whose value does not depend on other variables. In this study, there are two independent variables, namely:

1. Back Flexibility (X1)
2. Arm Muscle Strength (X2)
3. Hand Grip Strength (X3)

Dependent Variable

The dependent variable is a variable whose value depends on other variables, in this study the dependent variable is the O Goshi Technique's Throwing Speed (Y).

Normality test

The step before testing the hypothesis is to first test the requirements. Data analysis using the normality test, namely using the Liliefors test, (Sudjana et al.,2005). The purpose of the normality test is to find out whether the distribution is normal or not.

Homogeneity test

In addition to testing the distribution of values to be analyzed, it is necessary to test homogeneity to be sure that the groups that form the sample come from a homogeneous population. Homogeneity was sought using the F test.

Linearity test

The linear test is a test used to find out whether the independent variable and the dependent variable are linear or not. This test can be used as a requirement in correlation or linear regression analysis. The linearity test is intended to test whether the data being analyzed is linear or not, (Sudjana et al., 2003).

Product moment correlation

To find the relationship between each predictor and the dependent variable in testing the hypothesis between X1,X2,X3 and Y, statistics are used through product moment correlation, (Arikunto et al., 2010).

RESULTS AND DISCUSSION

Research objectives can be achieved by collecting data from each research variable. The data collected in this study consisted of three independent variables, namely: back flexibility, arm muscle strength, and hand grip strength as well as one dependent variable, namely the kicking speed of the O Goshi technique. The summary of the overall data description is presented in table form as follows:

Table 1. Description of data from measurements of back flexibility, arm muscle strength, hand grip strength and kicking speed in the O Goshi technique

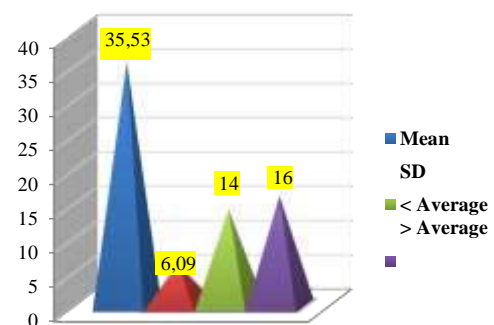
Result	Variable			
	Flexibility Back	Strength Arm	Strength Grip	Slam
Average	35,43	28,90	34,03	1,36
SD	6,09	8,67	6,65	0,08
< Average F	14	17	16	15
%	46,67%	56,67%	53,33%	50%
> Average F	16	13	14	15
%	53%	43,33%	46,67%	50%

The following is a partial explanation of the research results of each variable including the average, standard deviation, number of students who are below the class average and the number of students who are above the class average:

Back flexibility of bandar lampung judo athletes

The results of research and measurements on back flexibility variables in Bandar Lampung Judo athletes show that the average flexibility class is 35.53. The standard deviation of flexibility is 6.09 athletes who are below the class average by 14 (46.67%) and athletes who are above the class average by 16 (53.33%). So that can be depicted through a bar chart as follows:

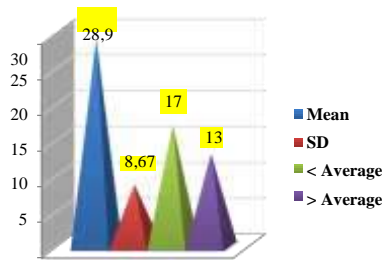
Fig 1. Bar diagram of back flexibility of Bandar judo athletes Lampung



Arm muscle strength of bandar lampung judo athletes

The results of research and measurements on arm muscle strength variables in Bandar Lampung Judo athletes show that the average strength class is 28.90. The standard deviation of strength is 8.67 athletes who are below the class average as many as 17 (56.67%) and athletes who are above the class average as many as 13 (43.33%). So it can be depicted through a bar chart as follows:

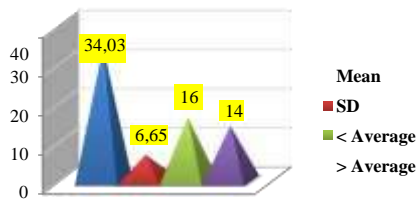
Fig 2. Bar diagram of arm muscle strength of judo athletes Bandar Lampung



Grip strength of bandar lampung judo athletes

The results of research and measurements on hand grip strength variables in Bandar Lampung Judo athletes show that the average hand grip strength class is 34.03. The standard deviation of hand grip strength is 6.65 for athletes who are below the class average of 16 (53.33%) and athletes who are above the class average is 14 (46.67%). So it can be described via a bar chart as follows:

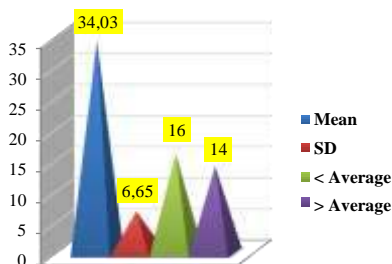
Fig 3. Bandar judo athlete's hand grip strength bar diagram Bandar Lampung



Speed of throwing technique of o goshi judo athlete bandar lampung

The results of research and measurements on the variable speed of the o goshi technique in Judo athletes in Bandar Lampung show that the average class speed of the o goshi technique is 1.36. The standard deviation of the slamming speed of the o goshi technique is 0.08 for athletes who are below the class average by 15 (50%) and athletes who are above the class average by 15 (50%). So that it can depicted through a bar chart as follows:

Fig 4. Bar diagram of the throwing speed of the o goshi technique of judo athletes in Bandar Lampung



Data analysis is used to answer the proposed hypothesis. Before data analysis is carried out, it is necessary to test the prerequisites for analysis, namely normality, homogeneity and linearity tests. The results of the prerequisite tests and hypothesis tests can be seen as follows:

Normality test

To test the normality of the data, use a normality test known as the Lilliefors test, (Sudjana et al., 2002). If L count < L table it means the data is normally distributed and otherwise the data is not normally distributed (Sudjana et al., 2002). The results of the normality test are as follows:

No	Variable	L Count	L Table	Conclusion
1	Flexibility	0,118	0,220	Normal
	Back			
2	Muscle	0,108	0,195	Normal
	Arm			
3	Strength	0,077	0,206	Normal
	Hand Grip			
4	Speed slam O Goshi	0,146	0,195	Normal

Homogeneity test

The homogeneity test is carried out to obtain information whether the two sample groups have homogeneous variances or not. The results of homogeneity calculations are presented in the following table:

Table 3. Homogeneity test

No	Data	F Count	F table	Conclusion
1	Back flexibility - Slam Speed	1,000	1,861	Homogen
2	Arm muscle strength - Slam Speed	1,000	1,861	Homogen
3	Hand grip strength - Slam Speed	1,000	1,861	Homogen

To find out which variables have the same variance, the test carried out is by comparing the largest variance and the smallest variance from each group so that the calculated F value is obtained using the test criteria if the calculated F value is < F table.

So both data are homogeneous or come from the same variance. It turns out that the test results show that F count < F table, so the two variances are homogeneous.

Linearity test

The linearity test is a test to determine whether the form of relationship between the independent variable and the dependent variable is linear. To test the linearity of the regression line with the F test and based on the calculations, the following results are obtained:



Table 4. Linearity Test

No	Variabel	F Count	F table	Conclusion
1	Back flexibility - Slam Speed	1,003	2,482	Linier
2	Arm muscle strength - Slam Speed	0,686	2,685	Linier
3	Hand grip strength - Slam Speed	1,342	2,533	Linier

Data Analysis

Relationship of back flexibility to kicking speed in the o goshi technique

Based on the data analysis obtained, the correlation value (R) is 0.560 (there is a positive/moderate relationship between back flexibility and the speed of the o goshi technique) and the percentage influence of the independent variable on the dependent variable is explained, which is called the coefficient of determination which is the result of squaring R. From the data analysis, a coefficient of determination (R²) was obtained 0.313, which means that the relationship between the independent variable (back flexibility) and the bond variable (o goshi technique slamming speed) is 31.3%, while the rest is influenced by other variables.

Relationship between arm muscle strength and throwing speed o goshi technique Based on data analysis, the correlation/relationship value (R) was obtained, namely 0.697 (there is a positive/strong relationship between arm muscle strength and the speed of the o goshi technique) and the percentage influence of the independent variable on the dependent variable is explained, which is called the coefficient of determination which is the result. from squaring R. From the data analysis, a coefficient of determination (R²) was obtained of 0.485, which means that the relationship between the independent variable (arm muscle strength) and the dependent variable (o goshi technique slamming speed) is equal to 48.5%, while the rest is influenced by other variables.

Relationship between hand grip strength and speed o goshi technique slam Based on data analysis, the correlation/relationship value (R) was obtained, namely 0.608 (there is a positive/strong relationship between hand grip strength and the slamming speed of the o goshi technique). The percentage of influence of the independent variable on the dependent variable is called the coefficient of determination which is the result of squaring R. From the analysis of this data, a coefficient of determination (R²) of 0.370 is obtained, which means that the relationship between the independent variable (hand grip strength) and the dependent variable (technical slam speed o goshi) is as big as 37.0%, while the rest is influenced by other variables.

The relationship between back flexibility, arm muscle strength and hand grip strength with kicking speed in the o goshi technique. Based on data analysis, it was obtained that the

correlation/relationship value (R) was 0.804 (there is a positive/very strong relationship between back flexibility, arm muscle strength and hand grip strength and the speed of the o goshi technique) and explained the percentage influence of the independent variable on the variable. The dependent variable is called the coefficient of determination which is the result of squaring R. From the data analysis, a coefficient of determination (R²) of 0.646 is obtained which means that the influence/contribution of the independent variables (back flexibility, arm muscle strength and hand grip strength) on the dependent variable (speed o goshi technique slam) is 64.6%, while the rest is influenced by other variables.

Flexibility is a very important and necessary element in all sports. Because flexibility supports the quality of allowing a joint segment to move as much as possible according to the possibility of movement (the width of the joint) thus allowing a muscle or group of muscles to contract in a position of maximum shortening and lengthening. Flexibility is very much needed in performing good judo kicks because almost all judo throwing techniques are based on the biomotor component of flexibility (Kadir et al., 2013).

From the results of the data analysis that has been carried out, it can be concluded that there is a significant relationship between back flexibility and the speed of the O Goshi technique in Bandar Lampung Judo athletes. Flexibility is very important in Judo, especially in performing the O Goshi throwing technique skill when the athlete pulls the opponent's hand and sweeps the opponent's leg, then good back flexibility will smooth out the O Goshi throwing movement. From the results of testing the second hypothesis, it was found that arm muscle strength had a significant relationship with the throwing speed of the O Goshi technique in Bandar Lampung Judo athletes. This finding means that the better the arm muscle strength, the better the throwing speed of the O Goshi technique in Judo athletes, conversely, the less arm muscle strength, the less optimal the throwing ability will be.

O Goshi's good throwing skills will be even better if they are supported by other physical factors possessed by the athlete or judoka. The physical factor is arm muscle strength. With good arm muscle strength, the athlete's strength to pull, push or lift during a slam will become easier.

In Judo, arm muscle strength plays an important role in the application of Judo techniques, especially the O Goshi kick. So good arm muscle strength can make judo athletes feel confident in being able to produce maximum kicks and be able to knock down opponents. The results of research conducted on hand grip strength variables show that there is a significant relationship to the speed of the O Goshi technique in Judo athletes in Bandar Lampung. Strength is defined as a component of a person's physical condition, the ability to use muscles to accept loads while working, then grip is the grip of the hand to hold.

Hand grip strength in this study is the effort of the hand muscles to provide strength when holding the opponent's judogi. In a match, each judo player has different grip characteristics. Commonly used grip techniques are two-handed grip and one-



handed grip. This grip technique is an indication of the type of judo player himself, namely the attack, defense and counterattack type. The grip is one of the stages in performing a judo technique. In other words, the grip influences the next movement.

Meanwhile, the combination of the independent variables of back flexibility, arm muscle strength, and hand grip above shows that there is a significant relationship to the speed of the O Goshi kick in Bandar Lampung judo athletes at 52.2%.

CONCLUSION

Based on data analysis and the previous discussion, the following conclusions can be drawn: there is a significant relationship between back flexibility and throwing speed in the o goshi technique in bandar lampung judo athletes, there is a significant relationship between arm muscle strength and throwing speed in the o goshi technique in bandar lampung judo athletes. There is a significant relationship between hand grip strength and throwing speed in the o goshi technique in bandar lampung judo athletes, there is a significant relationship between back flexibility, arm muscle strength, and big hand grip strength on the throwing speed of the o goshi technique in bandar lampung judo athletes, arm muscle strength has a greater relationship to the speed of the o goshi technique in judo athletes in bandar lampung.

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A NOVEL MICRO CONTROLLER BASED MULTI FOOD FLOUR MAKING MACHINE

Pradeep M, Karthika, Sangeetha, Ayyappa Srinivasan M G

St.Mother Theresa Engineering College, Vagaikulam, Thoothukudi

ABSTRACT

To replace the labor-intensive local method of mixing flour for both home and commercial purposes, a mixing machine was built. The machine's originality lies in its ability to interchange both the mixer basin and the stirrer to suit the type of material being mixed. The purpose of the machine is to improve the sanitary processing of flour into dough for bread baking and other related wheat products that are consumable by humans. The mixer does away with the messy and time-consuming traditional method of preparation. The mild steel U and square channel (1270 x 1000 mm) metal sheet that covered the whole frame with the exception of the underside was welded to form the frame. The transmission system and the 1:40 gearbox were placed in the U-Channel square base. The machine was made to combine components and 25 kg of flour into dough in under 25 minutes. The machine's efficiency is 87%. The machine's components include a driver pulley, V-belt, gearbox, stainless basin, stirrer, shaft, and a 2.5 horsepower electric motor running at 2840 rpm.

I. INTRODUCTION

Finely ground cereal grains or other starchy plant parts are used as flour, a fundamental element in baked goods and a food product in many other applications. Bread is mostly made from wheat flour. One source of energy is wheat (carbohydrate). On the other hand, it has notable concentrations of other vital nutrients, such as fiber and proteins, as well as trace levels of lipids, vitamins, minerals, and phytochemicals that may support a balanced diet [1]. Just that many emerging nations, including Nigeria, have seen a steady rise in bread consumption in recent years.

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Mixing flour to make dough has long been a key step in the food industry's production process. The necessity for an inexpensive flour mixing machine is growing since it is now necessary to mix flour for baked goods even in many houses [3]. Another culinary tool is the mixer, which rotates a set of beaters in a bowl of food to be prepared using a gear-driven mechanism. It does the repetitious chores of beating, whisking, and stirring

automatically. A mixer can also be used to knead dough when beaters are employed in place of dough hooks [4, 5, 6, 7, 8].

The size of a stand mixer ranges from compact countertop versions for domestic usage to massive commercial units. Stand mixers provide the mixing action by either rotating the mixing container (spiral mixers) or the mixing device (planetary mixers) vertically [9]. The mixing and kneading procedures are integrated into every mixing equipment on the market today [2]. A technique that produces a well-developed gluten network by homogeneously combining and hydrating the ingredients is necessary for making bread dough [4, 6, 10, 11, 12].

Nevertheless, small and medium-sized bakeries continued to find dough mixing to be unaffordable. Intimate mixing of the components to be combined is necessary for the main goal of solid mixing. This isn't that easy because there isn't a single mixer design that can meet every mixing need. It takes time and energy to mix flour since appropriate hygiene requires that contamination be avoided. Existing flour mixing machines have drawbacks such as needing a lot of time, money, and cleaning [13, 14, 15]. Given this drawback, a machine that can combine up to 25 kg of flour with minimal cleaning requirements and ease of use will be built.

II. PROPOSED METHODOLOGY

This study built an automated flour processing machine for pressed coconut pulp using the developmental research process. According to Richey and Klein (2005), developmental research is a way to create new protocols, approaches, and tools based on a thorough analysis of specific cases. It covers assessment in addition to product design and development. The framework of developmental research frequently consists of several stages,

including analysis, design, development, testing, and assessment. This study examined the prerequisites for enhancing the efficacy and efficiency of the apparatus.

Fig.1. Shows the block diagram of the apparatus.

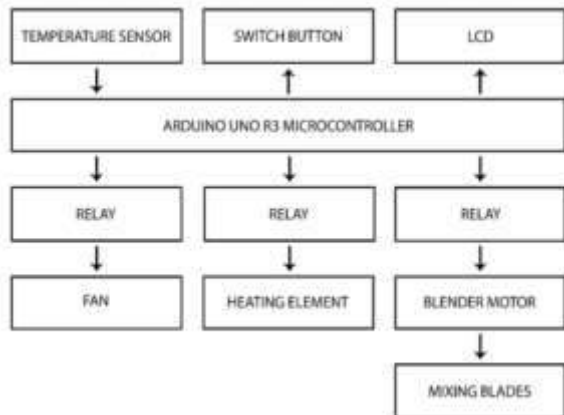


Fig.1. Block Diagram

The Arduino UNO R3 and C++ programming language were utilized by the researcher. The circuit's design by the researcher relied on a relay's capacity to open and close circuits. The max6675 and K-type thermocouple are mounted on the Arduino in order to collect and measure the temperature in order to run the uploaded software. To regulate every step of the coconut flour-making process, a 5V 4-channel relay is attached to the heating element, blender motor, and DC fan that processes the squeezed coconut pulp. The machine has a latch button switch because the software modifies the argument it should use to continue until it is finished, and it does so by frequently checking the status of the switch.

The Schematic diagram has been shown in fig.2

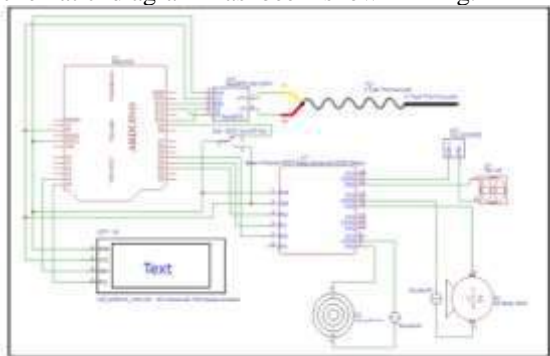


Fig.2. Schematic Diagram

The manual procedure had an influence on the researcher's programming and design of the Arduino code. The hardware components, iterations, and software system are created through iterative testing and cycles until the desired result is achieved. Temperature and process length are the two primary factors that must be altered or continuously monitored in order to develop a workable automated procedure for the machine.

The Ktype Thermocouple with Max6675 module converts unquantifiable data from raw data using its own Arduino library.

However, the process duration reduces the constant duration by one second every second by using for-loops. To reduce the amount of wiring that connects the LCD to the Arduino, the program code additionally makes use of the I2C LCD display library.

The Arduino based code has been shown in fig.3

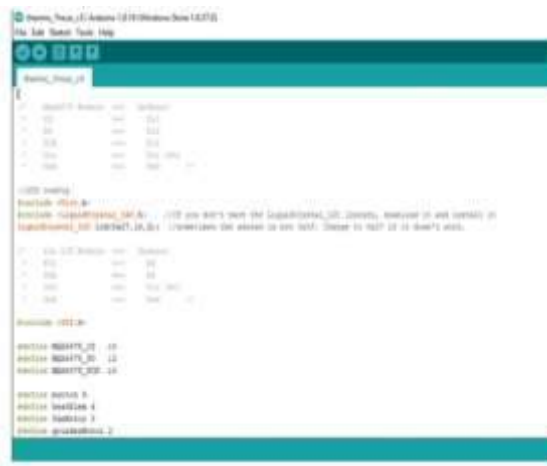


Fig.3. Arduino Coding

III. HARDWARE

Times New Roman or Times typeface should be used throughout the entire document. Fonts of type 3 are not to be used. If necessary for particular applications, different font styles may be utilized.

The following are the elements:

1. Heating element

2. The ingredient that was utilized in this study's drying procedure. The infrared heater quickly reaches the operational temperature by converting electricity into radiated heat and transferring it to colder locations.

3. AC Motor: An AC brush motor operates on 220V of alternating current. The motor is linked to the blades that are necessary for turning the crushed pulps of coconuts into flour.

4. DC fan: The fan helps the heating element during this study's air fry, or drying process. Also employed for the machine's exhaust are two 12 volt fans.

5. Arduino: The machine's embedded system uses an Arduino Uno R3 microcontroller. It can manage the various inputs and outputs needed for this investigation and is easy to use.

6. 5V 4-Channel Relay: Relays are electrically powered switches that join the machine's small current circuit to its bigger current circuit. The heating element, DC fan, and motor blender are examples of AC and DC equipment whose operation switches are controlled by this.

7. Thermocouple K-type using Max6675 module:

Because of the machine's construction, the thermocouple sensor may operate at high temperatures. It is situated within the processing area, where it operates continually and collects information to start a debate.



8. *Switching Power Supply*: The machine's electrical equipment is supplied with and kept steady with DC voltage input by the Power supply, an electronic device.

9. *16x2 LCD with I2C Display*: This LCD can show 16 characters on 2 lines. It is employed to show the machine's duration and temperature during each loop.

10. *Blade*: The crushed coconut pulp is divided into smaller pieces by the sharp blades.

Fig.4 shows the Hardware Prototype of the machine



Fig.4 Prototypical model

It is easy to integrate software and hardware together. The 5V 4 channel relay is linked to the processing components, motor, heating element, and DC fan, and the Arduino is uploaded with the program code. The heating element and grinding motor performance are taken into account while adjusting the repeating stages and cycles in the Arduino code. The combined components operate quietly and trouble-free. However, the machine vibrates when the grinding process starts, it disrupts the wire of the LCD, and it sometimes malfunctions.

IV.RESULTS

The table-I shows the results of the working model

Table 1. Evaluation of the project.

Parameter	Mean	Interpretation
Functionality	4.60	Highly Acceptable
Reliability	4.20	Moderately Acceptable
Efficiency	4.69	Highly Acceptable
Maintainability	4.38	Highly Acceptable
Portability	4.40	Highly Acceptable
OVERALL	4.45	Highly Acceptable

V.CONCLUSION

For increased efficiency, a flour mixing machine is developed for home users. This machine not only produces more hygienic mixed dough, but it also does away with the traditional method of dough preparation. The development of the flour mixing machine, which can now combine flour and components to create dough, shows how useful this type of food processing machinery is for manufacturing huge amounts while controlling costs. The flour mixing machine minimizes waste and operates quickly. This equipment is intended for use in restaurants and the bread-making sector, with the goal of enhancing individual health and hygiene.

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UNLEASHING NATURE'S POTENTIAL THROUGH PHYTOREMEDIATION STRATEGIES TO COMBAT HEAVY METAL POLLUTION: A REVIEW

Vikas Kumar^{1*}, Sandeep Kumar Tyagi², Ravindra Singh Parmar³

¹Department of Chemistry, IIMT University, Meerut-250 004 (U.P.), India

²Department of Environment Chemistry, IIMT University, Meerut-250 004 (U.P.), India

³Department of Chemistry, MIT, Meerut-250 004 (U.P.), India

*Corresponding Author

ABSTRACT

Heavy metal pollution is a pressing global concern due to its detrimental effects on human health and the environment. This paper delves into the sources and consequences of heavy metal contamination, emphasizing the urgency for effective remediation strategies. Phytoremediation emerges as a promising solution, leveraging plants' natural abilities to remove pollutants. Various phytoremediation techniques, including phytoextraction, phytofiltration, phytostabilization, and phytovolatilization, are explored alongside biotechnological approaches and plant selection criteria. The paper concludes by underscoring the utility of phytoremediation in improving soil quality and reducing heavy metal levels, while advocating for further research to optimize this process.

KEYWORDS: Heavy metal pollution, phytoremediation, biotechnological approaches, plant selection, soil quality improvement.

1. INTRODUCTION

Global landscapes are increasingly plagued by environmental pollution caused by heavy metals. The problem stems from the continuous extraction of these elements from ores and their subsequent processing for various applications, a process that always releases them into our fragile ecosystems. With the vigorous development of industrialization and the disturbance of natural biogeochemical cycles, the severity of heavy metal pollution continues to escalate. Unlike organic matter, heavy metals defy the natural degradation sequence and persist indefinitely once in the environment. This persistence breeds accumulation, a dangerous phenomenon in which these metals leach into soil and water with alarming regularity. This accumulation poses a serious threat to environmental balance and human well-being. In living organisms, heavy metals begin a sinister journey of bioaccumulation, imperceptibly penetrating into body tissues and steadily increasing in concentration as nutrient levels rise. This disturbing process, known as biomagnification, amplifies the dangers these metals pose to ecological balance and human health. Even in seemingly inert soil, heavy metals can play a toxicological symphony, disrupting the delicate harmony of microbial communities. The effects are dire, as reduced microbial populations and activity endanger the foundations of terrestrial ecosystems. In the face of this multifaceted crisis, the need for concerted action is undeniable. Only by working together to limit the flow and spread of heavy metals can we hope to protect our planet and its inhabitants from the harmful effects of pollution[1-3].

In intricate biological systems, heavy metals play dual roles and are divided into two categories: essential and non-essential. Essential heavy metals such as iron (Fe), manganese (Mn), copper (Cu), zinc (Zn) and nickel (Ni) occupy vital ecological niches, and organisms require trace amounts of trace elements to coordinate important physiological and biochemical processes. Their absence creates biochemical disharmony, making them an integral part of life's complex machinery. In contrast, non-essential heavy metals are merely interlopers without any inherent physiological or biochemical necessity. Cadmium (Cd), lead (Pb), arsenic (As), mercury (Hg), and chromium (Cr) are examples of this category, which lurk in biological systems without invitation or utility. Far from being beneficial, their presence often heralds destruction and toxicity, and casts a shadow over the delicate balance of organisms. Beyond a certain threshold, the presence of heavy metals changes from benign to malignant as they silently invade the normal functioning of living systems, thereby adversely affecting health. This invasion disrupts the complex orchestration of biochemical pathways, triggering a cascade of deleterious consequences that ripple across the biological spectrum. Therefore, vigilance and restraint must be exercised when managing heavy metal concentrations, lest their toxic properties overshadow the vitality of life[4-5].



2. SOURCES OF HEAVY METALS IN THE ENVIRONMENT

Heavy metals seep into our environment from multiple sources, blending the natural and man-made. Nature itself facilitates this influx through processes such as mineral weathering, erosion, and sporadic bouts of volcanic activity. However, it is human hands that leave the most indelible marks, with activities such as mining, smelting and electroplating being the main culprits. The problem is compounded by the use of pesticides and chemical fertilizers, including the use of phosphate fertilizers, as well as agricultural practices involving biosolids and sludge dumping. Sources of man-made pollution are increasing, and industrial emissions and atmospheric deposition have exacerbated pollution. Each of these activities, whether intentional or unintentional, contributes to the surge of heavy metals in our environment, creating a complex web of pollution that broadly erodes ecosystems[6].

3. HARMFUL EFFECTS OF HEAVY METALS ON HUMAN HEALTH

The shadow of heavy metal pollution hangs over the food chain, casting a shadow over human health. In intricate biological systems, many heavy metals and metalloids use toxicity as weapons and can cause serious damage even at extremely low concentrations. At the heart of heavy metal toxicity lies oxidative stress, a dangerous state caused by the rampant formation of free radicals. These reactive oxygen species (ROS) released by heavy metals cause a relentless attack on cellular integrity, overwhelming the body's innate defenses and leaving cells vulnerable to damage or death. Compounding the problem, heavy metals can unknowingly penetrate essential pigments and enzymes, disrupting their delicate balance and hindering their vital functions. Certain perpetrators stand out from others when dealing with the hazardous environment of heavy metal toxicity. Mercury, cadmium, lead and arsenic are the most problematic, their non-essential nature exacerbating their threat to human well-being. However, even essential heavy metals such as copper and zinc can cause toxicity if present in excess. The health effects of heavy metal exposure are diverse and dire, depending on variables such as metal type, concentration, and oxidation state[7].

4. GREENING THE EARTH: PHYTOREMEDIATION FOR HEAVY METAL POLLUTION

In the field of environmental remediation, phytoremediation has emerged as a beacon of hope, harnessing the symbiotic relationship between plants and soil microorganisms to decontaminate contaminated landscapes. It represents a multifaceted strategy capable of addressing issues such as heavy metals, radionuclides and organic contaminants, while offering a range of advantages. This innovative approach has been praised for its novelty, cost-effectiveness and efficiency. It is highly regarded for its inherent eco-friendliness and solar-powered

nature. At its core, phytoremediation is about maintaining the integrity of topsoil, protecting it from the ravages of contamination, while potentially improving fertility through organic inputs. The word itself is a blend of Greek phyto (plant) and Latin remedium (to remove evil), emphasizing the transformative power of green plants in correcting environmental problems. While the concept of phytoremediation may be relatively new, its aesthetic appeal and public acceptance have earned widespread acclaim since its inception. Notably, it is affordable, with installation and maintenance costs often being a fraction of traditional methods, making it an attractive option for large-scale restoration work. Furthermore, phytoremediation is a versatile tool with economic potential, ranging from risk control to phytostabilization to the extraction of valuable metals such as nickel, thallium and gold. Furthermore, the integration of fast-growing biomass plants such as willow, poplar and jatropha not only aids in restoration but also holds promise for renewable energy production, proving its versatility and sustainability. In the public eye, phytoremediation shines as a beacon of environmental innovation, offering a "green cleaning" alternative to traditional methods. Phytoremediation therefore serves as a powerful ally in the evolving field of environmental management, offering hope for a cleaner, greener future[8-9].

5. TECHNIQUES/STRATEGIES OF PHYTOREMEDIATION

Phytoremediation technologies include a variety of strategies, each harnessing the power of plants to mitigate environmental pollution. At the forefront is phytoextraction, also known as phytoaccumulation, which is the process by which plants selectively absorb contaminants from soil or water, effectively purifying the environment of toxins. Phytofiltration complements this approach, in which plants act as natural filters, purifying water or soil as it passes through the roots, leaving behind a cleaner, rejuvenated matrix. Phytostabilization, meanwhile, focuses on immobilizing contaminants within the soil matrix, preventing their migration and reducing their bioavailability to surrounding organisms. Phytovolatilization emerges as a solution for volatile pollutants, as plants absorb these substances and release them into the atmosphere in less harmful forms, effectively mitigating their impact on the surrounding environment. Finally, phytodegradation utilizes the metabolic capabilities of plants to decompose pollutants into less harmful substances through an enzyme process, further assisting environmental restoration work. Taken together, these technologies form a comprehensive toolkit for addressing a wide range of environmental contaminants, providing a sustainable and environmentally friendly approach to remediation challenges[10-11].

5.1. Phytoextraction

Phytoextracts are the cornerstone of phytoremediation and embody the remarkable ability of plants as nature's guardians,



selectively absorbing contaminants from soil or water through their roots and transporting them upward into above-ground biomass, especially shoots. This transformation process, also known as phytoaccumulation or phytosequestration, has attracted attention due to its toxicity in eliminating contaminant-plagued environments. The importance of metal transfer to buds cannot be overstated and represents a key biochemical mechanism underpinning the success of phytoextraction. In fact, the accumulation of contaminants in aboveground biomass is not only required but necessary for effective remediation efforts, especially given the impracticality of harvesting root biomass. Highlight the scientific consensus on the efficacy of botanical extracts. The nuances of metal translocation and their role in maximizing repair outcomes are revealed. In the complex dance of phytoremediation, phytoextraction demonstrates the symbiotic relationship between plants and their environment, offering hope for a cleaner, healthier future[12].

5.2. Phytofiltration

Phytofiltration becomes a powerful tool in phytoremediation, providing a natural and sustainable way to purify contaminated surface water or wastewater through plant intervention. This process depends on the plant's innate ability to absorb or adsorb contaminants from water, thus inhibiting their migration into underground aquifers. The versatility of plant filtration is evident in its various manifestations: Rhizosphere filtration utilizes the complex network of plant roots to filter pollutants, while bud filtration harnesses the capabilities of seedlings for a similar purpose. Additionally, stem filtration utilizes cut plant buds to remove harmful substances from the water using their absorptive capabilities. The efficacy of phytofiltration in reducing the movement of contaminants to groundwater sources became apparent, highlighting its potential to safeguard human health and ecological integrity. In an era where sustainable solutions are increasingly sought after, phytofiltration is a beacon of hope, providing a natural, environmentally friendly approach to water restoration challenges[12].

5.3. Phytostabilization

Phytostabilization, also known as phytoimmobilization, is a strategic intervention in the fight against soil pollution that uses selected plant species to hold contaminants in place, arresting their flow and limiting their entry into the ecosystem. As Singer explains, this technology represents a proactive approach to environmental management that aims to prevent contaminants from migrating into underground reservoirs and subsequently integrating into the food chain. Plants are masters of immobilization, utilizing a range of mechanisms to sequester heavy metals within the soil matrix. Phytostabilization can reduce the bioaccumulation of heavy metals in biota and inhibit their infiltration into groundwater reservoirs, but it is critical to recognize its limitations. The reality is that plant stabilization is not a panacea. Rather, it represents a management strategy aimed at neutralizing potentially toxic contaminants by

confining them to the soil matrix. It provides a pragmatic solution to the long-term challenge of soil pollution, acting as a bulwark against pollutants from insidiously eroding our ecosystems.

5.4. Phytovolatilization

Phytovolatilization is a fascinating aspect of phytoremediation that involves plants absorbing pollutants from the soil, converting them into volatile forms, and then releasing them into the atmosphere. The technology promises to address organic pollutants and select heavy metals such as mercury and selenium. However, its application is limited by the realization that it does not completely eliminate pollutants; rather, it simply transfers them from one medium (soil) to another (atmosphere) where they may be redeposited. The efficacy and ethics of plant volatilization remain topics of debate in the scientific community. While it offers potential ways to reduce pollutants, concerns remain about the potential for recontamination and atmospheric dispersion of pollutants.

5.5. Phytodegradation

Phytodegradation is a testament to the transformative power of plants, orchestrating the breakdown of organic pollutants through the wonders of enzymes such as dehalogenases and oxygenases, without relying on rhizosphere microorganisms. The scope of phytodegradation only applies to organic pollutants, as heavy metals are inherently non-biodegradable. Nonetheless, recent scientific research has delved into the field of plant degradation, exploring the efficacy of green plants against a range of organic pollutants, including synthetic herbicides and pesticides. It is worth noting that the emergence of genetically modified plants, represented by genetically modified poplar trees, has opened up new ways to improve plant degradation efficiency. Within the complex arrangement of environmental remediation, phytodegradation emerges as a compelling narrative of the symbiotic relationship between plants and pollutants, providing a beacon of hope in our collective pursuit of a cleaner, greener tomorrow.

5.6. Rhizodegradation

Rhizosphere degradation demonstrates a complex dance between plants and microorganisms coordinating the breakdown of organic contaminants in the soil matrix. This transformation process depends on the busy ecosystem of the rhizosphere, an intimate realm that extends about 1 mm around the plant roots and is heavily influenced by the presence of the rhizosphere. At the heart of rhizosphere degradation is a symphony of microbial activity powered by the plant's rich exudates, a complex mixture rich in carbohydrates, amino acids and flavonoids. In addition, plants act as benevolent benefactors, not only nourishing the microbial community with their secretions but also endowing the microorganisms with a large number of enzymes that degrade organic pollutants. The role of plants in cultivating an environment suitable for remediation, where microorganisms



and enzymes work together to harmoniously neutralize pollutants. In essence, rhizosphere degradation reveals the underlying potential of the rhizosphere as a bioremediation furnace, where symbiotic interactions between plants and microorganisms work together to clear the toxic burden of the soil, paving the way for rejuvenation and ecological resilience.

5.7. Phytodesalination

Phytodesalination emerged as a pioneering technology, heralding a new frontier in soil reclamation and agricultural sustainability. As described by Zorrig et al., this innovative approach exploits the unique ability of halophytes to extract salts from saline-affected soil, making them beneficial for normal plant growth. Halophytes are naturally adapted to salt environments and have obvious advantages over glycophytes in handling heavy metals. The accumulation of sodium ions in the above-ground biomass of halophytes further highlights their effectiveness in alleviating soil salinity, thus mitigating the adverse effects on glycophytic crops such as barley. In essence, phytodesalination represents a paradigm shift in sustainable land management, providing a natural and cost-effective solution to the widespread soil salinization challenge while increasing agricultural productivity and environmental resilience.

6. POTENTIAL BIOTECHNOLOGICAL APPROACHES FOR PHYTOREMEDIATION

Biotechnological approaches to phytoremediation include improving metal tolerance and accumulation through plant genetic engineering, and modifying rhizosphere microbial populations to enhance plant growth and metal uptake. Other techniques for cleaning up contaminated soil include using fungi and bacteria to promote plant growth, which improves soil quality and speeds the breakdown of toxins. Additionally, biosurfactants and chelating agents can be used to mobilize and dissolve contaminants, making them easier to remove from the soil. In addition, nanoparticles and nanomaterials have potential applications in improving plants' ability to absorb and move metals. Phytoextraction can be enhanced by using hyperaccumulating plant species.

7. HEAVY METAL TRANSPORTER GENE AND THEIR UPTAKE SYSTEM MODIFICATION

Heavy metal pollution caused by human activities such as industrialization and mining poses a serious threat to human health and the environment. Developing effective strategies to remediate contaminated sites is critical. The use of plants to extract and accumulate heavy metals is promising but relies on genes that regulate metal absorption and transport, such as heavy metal transporter genes. Modifying these genes through genetic engineering can enhance plants' tolerance and absorption of heavy metals. Nanoparticles also offer a potential solution for

improving metal uptake by plants. Further research is needed to develop safe and effective repair methods.

8. INCREASING THE SYNTHESIS OF HEAVY METAL LIGANDS CAN HELP IN REDUCING HEAVY METAL TOXICITY

Heavy metals pose serious health risks and environmental hazards due to their non-biodegradable nature. It is crucial to develop effective strategies to reduce heavy metal toxicity. One approach involves increasing the synthesis of heavy metal ligands, which form stable complexes with heavy metals, thereby reducing their toxicity. Plants produce various heavy metal ligands, such as organic acids and phytochelatin, to combat heavy metal stress. Genetic engineering can enhance ligand synthesis in plants and improve plant tolerance to heavy metals. Other methods include the use of rhizosphere bacteria and organic soil amendments that promote plant growth. Chelating agents such as EDTA and DTPA help remove heavy metals from contaminated sites. Overall, increased heavy metal ligand synthesis may mitigate toxicity, and further research is needed to develop safe and effective strategies[13].

9. PLANT SPECIES SUITABLE FOR PHYTOREMEDIATION

The success of phytoremediation depends on the plant's ability to absorb metals. To be effective, hyperaccumulator plants targeting specific contaminants are needed. The phytoremediation potential of several plant species including corn, pea, mustard and common sunflower was evaluated and the results showed different metal enrichment potential in hyperaccumulator plants. Different plant species show different abilities to accumulate specific heavy metals, for example, corn accumulates cobalt and chromium, sunflower accumulates cadmium, rapeseed accumulates chromium, and peas accumulate lead. Therefore, it is important to select plant species based on the type of contamination present to ensure effective phytoremediation. Tailor-made implantation techniques can improve the chances of successful accumulation of heavy metals[14].

10. PHYTOREMEDIATION PROMOTERS

Promoters such as phosphate-solubilizing bacteria, growth hormones, and osmotic agents can increase the rate of heavy metal (HM) formation. Phytohormones such as gibberellic acid, auxins, and cytokinins control the activity of plant meristems and morphogenesis. Effective control of these accelerators and their integration can improve the effectiveness of phytoremediation. Studying biomass balance and the metabolic fate of contaminants in plants is an important approach to demonstrate the relevance of phytoremediation.



11. CONCLUSION

phytoremediation is a promising and sustainable method of environmental remediation that utilises plants' inherent capacity to remove pollutants from the environment. While it has its limitations, it offers many advantages over traditional methods of remediation and has been successfully used to clean up a wide range of pollutants. Phytoremediation has the potential to play conserving the environment and preserving human health for future generations. Heavy metals pose a major risk to human health, the environment, and the soil. Phytoremediation, a plant-based approach for removing contaminants, is an effective and environmentally-safe strategy to remediate these pollutants. However, the process is time-consuming and poses threats to plant integrity due to heavy metal toxicity. This research looks at the causes and consequences of heavy metal contamination, phytoremediation methods, and ways to speed up the procedure, such employing chelating agents, metal-accumulating plants, and bio-augmented acidified manure. Research in molecular biology and genetic engineering may potentially help to increase the efficiency of phytoremediation. To fully comprehend how different types of catalysts affect the process, more study is required. Phytoremediation is a practical and affordable way to remove heavy metals from the environment and enhance soil quality.

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QUALITY OF LIFE PRIME RANKINGS AND REVIEW OF EVIDENCES

L.B Ngoze¹, Prof. Lalhriatpui²

¹Ph.D Scholar, Department of Economics, Mizoram University

²Professor, Department of Economics, Mizoram University

Article DOI: <https://doi.org/10.36713/epra16254>

DOI No: 10.36713/epra16254

ABSTRACT

The study focused on the various indicators of quality of life with evidences conducted globally and in India. A persons or society's quality of life measurement is quite difficult to comprehend. To understand a broader welfare status of a society and material aspects GDP and per capita income are considered as poor measures since it fails to capture the welfare aspect of society. The important rankings are highlighted where different indicators and dimensions are encompassed.

KEYWORDS: *quality of life, ranking, evidences*

INTRODUCTION

Quality of life is an integral part of any economy. It is highly dependent on economic factors; economic policies implemented by states. A persons or society's quality of life measurement is quite difficult to comprehend. To understand a broader welfare status of a society, material aspect i.e. Income or GDP, cannot alone explain the concept and this fosters the measurement of a broader concept of well-being to overcome the GDP limitations by including non-monetary indicators. There is a need for a broader aspect and more comprehensive study. Many studies have come up with a more holistic approach like Human Development Index (HDI), Physical Quality of Life Index (PQLI), Quality of Life Index (QoLI) etc. These approaches are an improved method and necessary conceptualization over the Gross National Product (GNP) method in analyzing the quality of life of any region. Three important indicator, viz. literacy rate, infant mortality rate and life expectancy at birth have been chosen and combined with equal weights to obtain PQLI and life expectancy, education and per capita income for the measurement of HDI. Literacy rate of any country or region is the percentage of the population of an area at a particular time aged seven years or above who can read and write with understanding. Infant Mortality Rate (IMR) is the number of deaths of infants under one year's old per 1000 live births. Life expectancy is generally recorded as a person's expected lifespan from birth and can be represented as either an expected mean or as the true average age of individuals born in that year (which can only be calculated after all people born in that year have passed away).

rate regarding Infant Mortality Rate (IMR) was rated 100, while the highest IMR was given the scale of 1. Whereas the literacy rates, measure as percentages from 1 to 100, provide their own scale. Once a country's performance in life expectancy, infant mortality and literacy has been rated on the scale of 1 to 100, the composite index for the country or any region is calculated by averaging the three ratings, giving equal weights to each.

Life expectancy, infant mortality and literacy are used as indicators of development, describing progress in health, sanitation, education and women's status. PQLI is the summation of complex social interrelationships on which no theoretical explanation imposes any given weights/biases. Equal weight is assigned to each component. The life expectancy in Nigeria is 49, infant mortality 180/1000 and literacy 25%. The PQLI is 25. The life expectancy at age 1 in the U.S. is 72, infant mortality 16/1000 and literacy 99% and the PQLI is 94. The PQLI informs about the changing distribution of social benefits among countries, between the sexes, among ethnic groups, and by region and sector. The PQLI facilitates international and regional comparisons by minimizing developmental and ethnocentricities. As the gap closes between current performances, the gaps between PQLI indices should close. The PQLI, with signs of lowered infant mortality and lengthened life expectancy, paints a less fatalistic pessimistic picture than the GNP.

Central to improving people's Quality of Life (QoL) is the ability to measure this concept. This is, however, made difficult by the concept's multi-dimensional nature where measurement is tasking. When assessing the diverse status of nation or region, it is necessary to move to the centre of gravity towards human welfare and quality criteria. There have been numerous attempts

The value of PQLI lies between 0-100 where 1 represents the worst performance by any country and 100 is the best performance. For life expectancy the upper limit of 100 was assigned to 77 years and lower limit to 28 years. The minimum



to construct alternative, non-monetary indices of social and economic well-being by combining in a single statistic a variety of different factors that are thought to influence the quality of life. The main problems in all these measures is selection bias and arbitrariness in the factors that are chosen to assess the quality of life and, even more seriously, in assigning weights to different indicators (measured on a comparable and meaningful scale) to come up with a single synthetic measure. GDP, despite its drawbacks, at least has a clear, substantive meaning and prices are the objective weights for the goods and services that make it up. In measuring non-monetary indices of social and economic well-being, assigning weights to each selected indicators becomes a problem in itself.

The concept of Quality of life encompasses physical and economic improvements as well as individual, social, cultural, spiritual and political ideas. In studying this concept the researcher has the freedom to choose any indicators that he sees fit the area of study, so it is based on his/her discretions. Various indicators that suits a particular study can be selected to find the wellbeing of that study area or a set of commonly accepted indicators can be chosen.

In India, the quality of life continues to be appalling with the country ranked poorly at 132 among 191 countries on the Human Development Index of the United Development Programme (UNDP) that was released globally in September 2022. The five countries with the highest HDI are Norway, Switzerland, Ireland, Germany and Iceland. The five countries with lowest are Niger, Central African Republic, Chad, Mali, and Burkina Faso. The COVID-19 pandemic has had a devastating impact on human development, particularly in developing countries. India scored 0.633 and was placed in medium human development category. In South Asian Region, Sri Lanka (73) emerged as the best performer followed by Maldives (87) were placed in 'high human development' category followed by India (134), Bhutan (125), Bangladesh (129), Nepal (146), Pakistan (164) and Afghanistan (182). India ranks lowest among BRICS nations and its value increased from 0.428 in 1990 to 0.642 in 2015. However, its average annual growth in HDI (1990-2015) was higher than that of other medium HDI countries. The HDI can be used to question national policy choices, asking how two or more countries with the same level of income or GDP can end up with different human development outcomes.

Published annually since 1990, the index goes beyond a nation's gross domestic product (GDP) to measure the general well-being of people under a host of parameters, such as poverty levels, literacy and gender-related issues. The goal is to contribute toward the expansion of opportunities, choice and freedom.

PRIME RANKINGS

While specific frameworks may vary depending on the context and purpose of the Quality of Life (QoL) index, they typically consider broader range of factors that encompass different domains of life.

The research paradigm about individual's quality of life in a society imposes a multifaceted and complex analysis. The Life Quality Research Centre (LQRC) address this as thematically divided into six scientific areas: Education and training; physical activity and healthy lifestyles; food production and technology on food behaviors; organizational dynamics; motor behavior; and individual and community health. There have been several studies conducted on the QOL Index in India, which aim to assess the well-being of the population and to identify areas of improvement.

1. Human Development Index (HDI): The HDI is widely used index that measures the average achievements of a country in three basic dimensions of human development: a long and healthy life, access to knowledge, and a decent standard of living. India's HDI has improved over time, but still lags behind many other countries, particularly in terms of health and education outcomes. The HDI has been used to assess human development in India and to compare its performance with other countries. Here are some key data points on HDI in India:

a) **HDI Value:** According to the 2021 Human Development Report, India's HDI value is 0.647, which places it in the medium human development category. India's HDI value has increased over time, reflecting improvements in life expectancy, educational attainment, and income.

b) **Life Expectancy:** India's life expectancy at birth has increased from 59 years in 1980 to 69 years in 2020. This reflects improvements in health care, nutrition, and disease control.

c) **Education:** India has made significant progress in expanding access to education, particularly in terms of primary and secondary schooling. The adult literacy rate has increased from 52% in 1981 to 74% in 2020.

d) **Standard of Living:** India's standard of living, as measured by gross national income (GNI) per capita, has also improved over time, although it remains relatively low compared to other countries. In 2020, India's GNI per capita was estimated at \$1,910.

e) **Regional Disparities:** There are significant regional disparities in HDI across India, with some states, such as Kerala and Goa, having higher HDI values than others, such as Bihar and Uttar Pradesh. These disparities reflect differences in income, education, and health outcomes across different regions.

The Inequality-adjusted Human Development Index (IDHI) is an additional indicator introduced in the Human Development Report in 2010. It takes into account inequality as the fourth dimension alongside the three dimensions used in HDI measurement. It indicates the loss in HDI due to inequality. It takes into account not only the average achievements of a country or region in health, education and income, but also those achievements are distributed among its population by 'discounting each dimension's average value according to the level of inequality'. The approach is based on the distribution-sensitive class of composite indices proposed by Foster, Lopez-Calva, and Szekely (2005), which draws on the Atkinson (1970) family of inequality measures. It is computed as the geometric mean of dimension indices adjusted for inequality. The inequality in each dimension is estimated by the Atkinson



inequality measure, which is based on the assumption that a society has a certain level of an aversion to inequality. While the HDI can be viewed as an index of average achievements in human development dimensions, the IHDI is the level of human development when the distribution of achievements across people in the society is accounted for. The IHDI will be equal to the HDI when there is no inequality but falls below the HDI as inequality rises. The difference between the HDI and IHDI, expressed as a percentage of the HDI, indicates the loss in human development due to inequality.

Overall, the HDI provides a useful tool for assessing human development in India and for comparing its performance with other countries. While India has made significant progress in expanding access to education and improving health outcomes, it still faces challenges in ensuring equitable access to opportunities and outcomes, particularly for marginalized and disadvantaged groups.

2. World Happiness Report: The World Happiness Report is an annual publication that ranks countries based in self-reported measures of well-being, such as life satisfaction, happiness, and freedom. Countries are rank based on several factors such as real GDP per capita, social support, healthy life expectancy, freedom to make life choices. The World Happiness Index is based on two key ideas- happiness or life evaluation measured through opinion surveys and identifying key elements that determine well-being and life evaluation across countries. India ranks 126th out of 143 nations in the World Happiness Report 2024 and ranked behind Pakistan, Palestine and Niger which is relatively low on this index, reflecting challenges such as poverty, inequality, and social unrest. This report is produced by the Sustainable Development Solutions Network, a global initiative for the United Nations. The ranking is based on data from the Gallup World Poll, which surveys individuals in over 150 countries on various aspects of their lives, including their levels of happiness and well-being.

Here are some key data points on the World Happiness Index:

a. Top-ranked Countries: The 2024 World Happiness Report ranks Finland as the happiest country in the world, followed by Denmark, Switzerland, Iceland, and the Netherlands. Afghanistan was ranked the unhappiest nation, followed closely by Lebanon, Sierra Leone, Zimbabwe respectively.

b. India's Rank: India ranks 126th out of 143 countries in the 2024 World Happiness Report, reflecting challenges such as poverty, inequality, and social unrest. It even lacks behind neighbouring nations like Nepal, China, Bangladesh and Sri Lanka. Factors such as marital status, social engagement and physical health also influence life satisfaction among older Indians. Education level and social caste also play significant roles, with those with higher education and higher social castes reporting greater life satisfaction

c. Factors Affecting Happiness: The World Happiness Report takes into account a number of factors that are associated with happiness and well-being, including income, social support,

freedom, trust, and healthy life expectancy.

d. Regional Patterns: The report also highlights regional patterns in happiness and well-being, showing that the happiest countries are typically those in the Nordic region, while the least happy countries are in Africa and South Asia.

The World Happiness Report provides valuable insights into the well-being of individuals and societies, and has helped to raise awareness about the importance of happiness and well-being in policymaking and development. By ranking countries based on self-reported measures of happiness and well-being, the report offers a unique perspective on the quality of life in different countries and regions, and provides a framework for policymakers to identify areas for improvement.

However, the World Happiness Report has received some criticism over the years, with some researchers questioning its methodology and the validity of its findings. It has been criticized that the report relies on self-reported measures of happiness and well-being, which some researchers argue subjective and susceptible to bias. Critics argue that self-reported measures of happiness are influenced by cultural and social factors, and may not accurately reflect actual levels of happiness and well-being. The report also takes into account the limited number of factors that are associated with happiness and well-being, such as income, social support, and healthy life expectancy. Critics argue that other factors, such as social inequality, political stability, and environmental quality, should also be taken into account.

Despite these criticisms, the World Happiness Report remains a valuable resource for policy makers and researchers, providing important insights into the state of happiness and well-being across the world.

3. Mercer's Quality of Life Rankings: Mercer's Quality of Life Rankings is an annual study conducted by the Global consulting firm Mercer. The study provides a ranking of the quality of living in cities around the world, based on 39 factors that are deemed important for determining the quality of living. The study uses data from variety of sources, including government agencies, international organizations, and in-house research, to evaluate the living conditions in each city. The study is intended to help multinational companies and organizations determine the compensation and benefits they should offer their employees in different locations, as well as to provide information to individuals and families who are considering a move to new city.

New York is used as the base city in comparing the factors taken into account for the global ranking. Data was collected from 241 countries across 5 continents. Mercer bases its annual global ranking of cities on 'data on quality of living for employees sent to work abroad'. Therefore, Mercer's primary audience appears to be companies that operate and invest internationally and employees arranging compensation when working abroad. Mercer states that



“quality of life” is subject to personal circumstances (e.g., health). The index is categorized into 10 where top 5 represents $\frac{3}{4}$ of total weight – political and social environment, medical and health considerations, public services and transport, consumer goods, recreation, socio-cultural environment, natural environment, housing, economic environment and schools and education.

The report evaluates just short of 450 cities worldwide based on 39 criteria, on a scale of 0 to 10 (low to high). The latest edition of Mercer’s Quality of Living Rankings, published in 2023, ranks Vienna, Austria as the city with the highest quality of living globally, followed by Zurich, Switzerland and Auckland, New Zealand. Places with lower quality of living include several African cities- N’Djamena (Chad), Bangui (Central African Republic) and Khartoum (Sudan). The highest-ranked city in India is Mumbai, which was placed at 143rd globally. While other cities like Delhi (162nd), Kolkata at 163rd, Hyderabad at 140th are worth noting that the ranking in India are generally lower compared to cities in other countries, reflecting the ongoing challenges facing the country in terms of air pollution, traffic congestion, safety, and other factors that can impact the quality of life. However, it is worth noting that India has made significant progress in recent years in improving the quality of life in its cities, particularly in areas such as healthcare, education, and access to technology and communications.

4. The Economist Intelligence Unit’s Livability Ranking: This is an annual study that provides a ranking of the most livable cities in the world. The study evaluates cities based on five categories: stability, healthcare, culture and environment, education, and infrastructure. Each category is further divided into several sub-indicators, and the cities are ranked based on the overall score they receive across these categories.

The study uses data from a variety of sources, including government agencies, international organizations, and in-house research, to evaluate the living conditions in each city. The study is intended to help individuals, companies, and organizations make informed decisions about where to live, work, or invest.

In the latest editions of the study, published in 2023, Vienna, Austria was ranked as the city with the highest quality of living globally, followed by Auckland, New Zealand, Melbourne Australia and Vancouver, Canada. The Highest ranked city in India was Hyderabad, which was placed at 116th globally.

REVIEW OF EVIDENCES

A study by the International Institute for Population Studies (IIPS) found that the overall quality of life in India has improved since 1990, with health, education and economic outcomes showing significant improvements. The study found that overall, India is making progress towards improving quality of life. It reported that access to health care and education had improved, poverty had decreased, and life expectancy was on the rise. However, it also highlighted areas where more effort is needed such as reducing inequality and tackling environment degradation.

The World Bank also conducted studies on impact of public services on poverty and inequality in India. One of the most recent studies found that economic growth can reduce poverty levels in rural areas across all Indian states. Additionally, improved access to public services like health care, education and infrastructure can help reduce inequalities between urban and rural populations in India. The World Bank recommends targeting interventions like agriculture productivity, access to finance, and improved public services such as healthcare and education. Additionally, many states have implemented programs that provide social assistance or support for vulnerable populations such as the elderly and disabled. Finally, some states have implemented economic strategies that focus on reducing income disparities between urban and rural populations.

One research paper that examines the QoL index in India is titled, ‘Quality of Life: A study on Rural India’ by Dr. Shikha Gupta and published in the International Journal of Population, Environment and Sustainable Development in 2017. The study uses primary data from field surveys conducted in rural areas of Uttar Pradesh to analyze various components such as Housing conditions, sanitation facilities, access to resources and other aspects that impact quality of life. The study found that access to healthcare, education and employment had improved in recent years. Despite this progress, there were still areas where improvement is needed such as reducing poverty and inequality, promoting gender equality and tackling environmental degradation. The study also highlighted the need for better infrastructure development, increased access to renewable energy sources and improved wildlife habitats. The study concludes that the overall quality of life for rural population has improved over time but still remains low compared to urban populations.

Also, a study by Indian Institute of Technology (IIT) Delhi, titled ‘Quality of Life in Urban India: A Perceptual Study’ found that economic indicators such as per capita income, employment rate and inflation have significant impact on quality of life in India. The study aimed to assess the quality of life of people living in urban areas of India, with a focus on the cities of Delhi, Kolkata, Chennai and Bangalore.

The study was conducted through survey of 4000 individuals from different socio-economic backgrounds. The study found that overall, the quality of life in urban India is perceived to be moderate. However, there were significant variations in quality of life across different socio-economic groups. Some key findings of the study were:

- Basic amenities such as water supply, sanitation and waste management were found to be inadequate in many urban areas.
- Pollution, traffic congestion and noise were major concerns for people living in cities.
- There were significant variations in the quality of life across socio-economic groups, with people from lower



socio-economic backgrounds facing more challenges in accessing basic services and amenities.

- The study highlighted the need for better governance and planning to improve the quality of life in urban India.

Another study by the Centre for Monitoring Indian Economy (CMIE) examined various factors such as health care expenditure, education spending and access to resources which significantly influence quality of life. While CMIE has conducted research on a wide range of economic issues, including poverty, employment and income distribution, it does not typically focus specifically on the quality of life in India. However, CMIE does regularly collect and analyze data on variety of socio-economic indicators that are relevant to assessing the quality of life in India. One such indicator is the Consumer Pyramids Household Survey, which is conducted by the CMIE and is one of the largest household surveys in India. The survey covers a wide range of topics, including household income, consumption, assets and liabilities as well as health, education and employment. The survey data can be used to generate insights into the quality of life of households in India. For example, the data can be used to assess the extent to which households, have access to basic services and amenities such as electricity, clean water and sanitation. It can also analyze household expenditure patterns and to identify areas where households may be facing financial constraints that could impact their quality of life.

A study by the National Family Health Survey (NFHS) 2015-2016 found that health indicators such as nutrition, child mortality rate and access to healthcare have a positive impact to healthcare have positive impact on quality of life in India. While the NFHS primarily focuses on health-related indicators, it also provides valuable data on socio-economic and demographic factors that are relevant to assessing the quality of life of people in India. For example, the survey includes information on household assets, including housing, vehicles and household appliances. The survey also includes information on education, employment and income which are important indicators of socio-economic well-being and can impact the quality of life of individuals and households. In addition, the survey includes information on health-related quality of life indicators such as prevalence of chronic diseases, nutritional status, and access to healthcare services. Overall, the NFHS provides a comprehensive picture of the health and socio-economic conditions of households in India and can serve as a valuable resource for policymakers, researchers and other stakeholders who are interested in improving the quality of life of people in the country.

'A Comparative Study of Quality of Life in Kerala and Tamil Nadu' was conducted by researchers from the Department of Economics at St. Thomas College, Thrissur, Kerala. The study used data from National Sample Survey Organisation (NSSO) and the Human Development Report (HDR) to compare various indicators of quality of life in the two states. The study found that overall, Kerala performed better than Tamil Nadu in terms of most

indicators of quality of life, such as life expectancy, infant mortality, literacy rates, access to safe drinking water and access to healthcare. Kerala also had a higher Human Development Index (HDI) compared to Tamil Nadu. However, Tamil Nadu performed better in some areas such as access to electricity, sanitation facilities and gender equality, as measured by the Gender Development Index (GDI). Overall, while there might be variations in the specific indicators used in measuring quality of life indicators used, the available evidence suggests that Kerala generally performs better than Tamil Nadu in terms of most Indicators of quality of life. However, both states are known for their relatively high levels of human development compared to other states in India.

CONCLUSION

The concept of QoL index encompasses physical and economic improvements as well as social, cultural, spiritual and political ideas. The review of evidences provides valuable insights into the quality of life and can serve as useful resource for policymakers, researchers and other stakeholders

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DELVING INTO THE PEDAGOGICAL TRANSITIONS OF PRE-SERVICE TEACHERS TO NEW NORMAL: INDIVIDUAL DIFFERENCES OF ELEMENTARY LEARNERS IN FOCUS

Estella Marie P. Alicante-Martel¹

¹Faculty, University of Mindanao Tagum College, Tagum City, Philippines

Article DOI: <https://doi.org/10.36713/epra16268>

DOI No: 10.36713/epra16268

ABSTRACT

This research inquiry aimed to explore and describe the experiences of elementary pre-service teachers on pedagogical transitions to new normal. The study used a qualitative research design employing a phenomenological approach. The study focused on the experiences, coping strategies and insights of the fourteen (14) elementary pre-service teachers in private tertiary institutions in Tagum City, Davao del Norte. Seven (7) participants underwent in-depth interviews, and another seven (7) participants underwent focus group discussion. On the experiences of elementary pre-service teachers in the pedagogical transitions, the study revealed that the pre-service teachers facing difficulty on students' lack of participation, embracing teaching and technological skills, experiencing intermittent and unstable internet connection, struggling in finding appropriate teaching strategies and learning virtual teaching strategies with the guidance of cooperating teacher. To cope with the challenges, data showed that pre-service teachers were maintaining patience, employing technology integration in virtual class, utilizing differentiated strategy, creating a conducive virtual learning environment, and having a positive attitude. Apart from the findings, pre-service teachers gained insights of equipping pre-service teachers with professional skills, realizing one's potential, improving adaptability among pre-service teachers and enhancing creativity of pre-service teachers. These results are important to the pre-service teachers, cooperating teachers, Higher Education Institutions' administrators and Commission on Higher Education for them to be aware and understand the practice teaching experiences of pre-service teachers. This will help them in making initiatives to support and strengthen the curriculum, programs **and training intended for the pre-service teachers who will also benefit from this study.**

KEYWORDS: pedagogical transitions, new normal, qualitative-phenomenological study, online teaching, private tertiary institutions, elementary pre-service teachers

INTRODUCTION

In a teacher education program, teaching internship is crucial as it enables pre-service teachers to apply their knowledge and skills in an actual classroom situation. The Commission on Higher Education switched from traditional to online education because of the pandemic to avoid and minimize the danger of infection in the academic community. However, most pre-service teachers have difficulty adjusting to this new normal. The sudden shift in the instructional delivery mode for teaching internship enables pre-service teachers to encounter quite diverse and challenging circumstances. These pedagogical transitions pose difficulty in delivering content and managing virtual classroom for pre-service teachers.

A study conducted by Ogonnaya et al. (2020) in Ghana revealed that pre-service teachers faced various issues due to many institutions switching to online teaching and learning. Pre-service teachers at a Ghanaian university face difficulties when teaching and learning online, such as poor internet connectivity, a high cost

of data, irregular power supply, a lack of suitable gadgets, an inability to effectively manage their time, and family disruptions. In addition, a study conducted in Pakistan by Mahmood and Iqbal (2018) discovered that pre-service teachers' lack of experience and expectations about the teaching and learning environment in schools presents issues. Their challenges during practice teaching are divided into the following five categories: facility needs, instructional needs, administration's attitudes, student behavior, and mentoring of pre-service teachers. Furthermore, in Turkey, Özüdoğru (2021) highlighted that pre-service teachers have issues with the online educational process. The issues on the implementation, student, internet connection, technical, and instructor are what the pre-service teachers encountered. The pre-service teachers claimed that their most significant issues were a lack of computers, limited internet connection, technical difficulties during online classes, and not receiving instructor feedback

In the Philippines, Napanoy et al. (2021) conveyed that some impediments that pre-service teachers encountered are the



communication with learners, awareness of teaching techniques and strategies, the context for teaching and learning, and the new virtual learning environment. Additionally, pre-service teachers in one of the Philippines' state colleges cited difficulties with lesson planning, classroom management, and technology in their demonstration teaching. Furthermore, a study conducted by Ugalingan et al. (2021) revealed that since the transition to online education required modifications in how they offered instruction, pre-service instructors initially had difficulty. Also, pre-service teachers encountered different challenges such as interaction in an online environment, lack of self confidence in teaching, and technical difficulties.

Further, based on my first-hand observation in one of the private tertiary institutions in Tagum City, there are some pre-service teachers that have difficulties in adjusting to the pedagogical transitions to new normal. Based on the initial interview, it is a challenge to them to find and discover teaching practices that is appropriate to online education that focuses on catering to students' differences. It becomes an issue when pre-service teachers' content knowledge, experience, and training are inadequate. In these pedagogical transitions in our existing educational system, they are not adequately prepared, which restricts their ability to select efficient pedagogical methods and curriculum materials.

Pre-service teachers' pedagogical transitions are among the most important issues in the new normal. Therefore, it is crucial to address issues pertaining to the pre-service teachers' experiences with these pedagogical transitions. This study will give the Commission on Higher Education (CHED) the information about pre-service teachers' experiences in their practicum course that they can use to revisit and strengthen the curriculum in the new normal. In this inquiry, the experiences of participants may offer ideas for coping with the pedagogical transitions to the new normal. Their insights about the pedagogical transitions that focuses on catering to the differences of students may help to improve the practice teaching course in the new normal.

PURPOSE OF THE STUDY

This phenomenological study aimed to explore the experiences of pre-service teachers in the pedagogical transitions to the new normal that focuses on the individual differences of elementary students in private tertiary institutions in Tagum City, Davao del Norte. Furthermore, this study aimed to generate results that may give guidance to pre-service teachers in thinking of coping strategies to these pedagogical transitions that gives focus on the students' differences in the new normal education setup.

At this stage in study, pedagogical transition generally defined as the shift to alternative mode of instructional delivery known as online education.

RESEARCH QUESTIONS

This study aims to answer the following questions:

1. What are the experiences of pre-service teachers in pedagogical transitions in catering to students' individual differences in the new normal?
2. How do the pre-service teachers cope with the pedagogical transitions in catering to students' individual differences in the new normal?
3. What are the insights of pre-service teachers on pedagogical transitions in catering to students' individual differences in the new normal?

METHOD

In this study, qualitative research was utilized to analyze the phenomenon and gain a thorough understanding of it. Additionally, data about the topic under study were gathered and examined using qualitative research method. The use of qualitative research was ideal for my study since it enabled me to describe the common experiences of the participants. Related to this are pre-service teachers' experiences with pedagogical transitions to the new normal. Furthermore, this study used a phenomenological approach to examine pre-service teachers' experiences. A qualitative phenomenological research design was utilized for the reason that I gathered data and information by means of interviews about the lived experiences of elementary pre-service teachers on the pedagogical transitions in the new normal that focuses on catering the students' individual differences. All data that were obtained was utilized to interpret, evaluate, and understand the phenomena on pedagogical transitions of pre-service teachers in the new normal and to describe it substantially.

This phenomenological study was participated by 14 pre-service teachers from private tertiary institutions in Tagum City, Davao del Norte, Philippines. Among the 14 participants, seven (7) went through in-depth interviews, and seven (7) were subjected to focus group discussion. This study adhered to the idea put forward by Creswell & Creswell (2018) that phenomenology involves 3–10 individuals and is adequate for conducting qualitative research, and that this participants' number is sufficient to saturate the information in the inquiry. The interviews were performed virtually using the Zoom application. In the selection of the participants, purposive sampling was utilized in this inquiry. Patton (2015) mentioned that purposive sampling is a procedure that the researcher specifically chooses the study participants based on the qualities they possess.

The following inclusion criteria was employed in the selected participants of this study: (a) must be officially enrolled in a practicum course in private tertiary institutions in Tagum City, Davao Del Norte; (b) must have been already deployed to the respective cooperating school; (c) must have facilitated in online class; (d) must have facilitated in catering the individual differences of elementary students; (e) must be willing to participate in this study.

In this study, I gave emphasis to the use of data coding and thematic analysis in the formulation of themes. Data coding and



thematic analysis are some steps in qualitative data analysis (Akinyode & Khan, 2018). Coding is the process of categorizing subjects, interests, preferences, and disliking that emerge from participant replies which are evaluated by the researcher (Sutton & Austin, 2015). Additionally, a technique for finding, evaluating, and reporting patterns or themes in data is called thematic analysis. It is an effective technique for examining the participant's viewpoints, highlighting parallels and differences, and revealing unexpected insights (Nowell et al., 2017). Since thematic analysis was flexible and practical as a research tool and has the ability to produce a significant, comprehensive, and rich record of the data, it is particularly beneficial in this study (Castleberry & Nolen 2018).

REVIEW OF RELATED LITERATURE

Pedagogical Transitions

The term "pedagogical transition" refers to the change from one delivery method to another, typically remote and online. It is a new event that emerged because of the pandemic and a brief change in the delivery of instruction (Hodges et al., 2020). Moreover, as a pedagogical transition, distance learning is a mode of instructional delivery in which the learning happens between the students and their teacher that were in a different location during discussions. Further, the mentioned distance learning has three types: the modular distance learning, online distance learning, and TV/Radio-based instruction (Quinones, 2020).

Likewise, Pace et al. (2020) expressed that pedagogical transition is when a physical classroom is replaced with a virtual one, requiring many academic institutions to quickly adapt. Moreover, a particular difficulty in a virtual class for educational institutions is coming up with a strategy to maintain classes interesting, engaging, and safe. As an outcome, many educational institutions globally are reconsidering and redesigning their teaching pedagogies. Furthermore, pedagogical transition refers to the shift to a different method of delivering education. It is the transition from face-to-face instruction to online education because of a crisis situation. This shift in the educational landscape, specifically online education, entails synchronous and asynchronous learning (Khanal, 2021).

Experiences of Pre-service Teachers on Pedagogical Transitions

Challenges with internet connectivity were considered as the primary barrier to obtaining and using electronic resources by teachers (Olaniran et al., 2017). Similarly, Alan et al. (2020) stated that pre-service teachers encountered the problems in terms of the dependence of online education on technology and inadequate infrastructure for example internet and electricity. Also, another drawback of online education is the absence of

constructive communication. Hence, poor interaction, students' passivity, and preventing socialization are a few of the issues that arise.

Likewise, Jin (2022) highlighted that pre-service teachers also experienced challenges about technology, the decision regarding the right time to step in, as well as students' participation. Also, the internet was unreliable, and Zoom lagged, leading the pre-service teachers to occasionally talk over the students. Consequently, Sánchez (2019) conveyed that the lack of teacher training, physical barriers, and the diversity of students are some of the barriers and impediments to participation and learning in educational environments. Hence, students are unable to participate in and learn from pre-service teachers' conversation because of these difficulties. Meanwhile, pre-service teachers experienced many difficulties in identifying appropriate strategies in a virtual class. Students' varied learning preferences, attitudes, and values are responsible for difficulties. As a result, pre-service teachers always struggle to create lesson plans that include the necessary activities and discover effective teaching methods that consider student differences (Napanoy et al., 2021).

Insights of Pre-service Teachers on Pedagogical Transitions

Online teaching provides a setting for preservice teachers to recognize difficulties and build resilience to employ various strategies. As a result, the pre-service teachers tried to use various ways to meet the needs and interests of the children, even though many difficulties arose; this process cannot be separated from reflection (Jin, 2022). In addition, Dhawan (2020) mentioned that online instruction and learning give pre-service teachers the flexibility to adapt their practices to the unique needs of their learners. Thus, a wide range of online materials are accessible and are seen to be crucial for efficient and successful teaching and learning. Also, in this pedagogical transition, pre-service instructors can maintain interactivity in their lessons by using a combination of voice, video, and text to connect with their students.

Moreover, Singh and Kasim (2019) revealed that some effective technology pedagogical content knowledge approaches were used to draw pre-service teachers' attention and help them achieve their teaching potential. Also, it is believed that in order for pre-service teachers to meet the challenges in the context of education, they must have a clear understanding of the technology pedagogical content knowledge for teaching practice. Besides, establishing pedagogical conditions at the higher school and developing learning technologies that bridge the gap between theoretical and practical knowledge are the authentic ways to address the challenges of realizing teachers' pedagogical potential. Additionally, it has been found that pedagogical settings significantly influence how well future primary school teachers are prepared for their training (Zhakipbekova, 2018).

**RESULTS AND DISCUSSIONS**

Table 1
Major Themes and Core Ideas on the Experiences of Pre-Service Teachers in Pedagogical Transitions in Catering to Students' Individual Differences in the New Normal

Major Themes	Core Ideas
Facing Difficulty on Students' Lack of Participation	<ul style="list-style-type: none"> • having problems in conveying students turning on camera during class participation • lacking students' participation during teaching demonstrations • keeping on listening but not participating in class • having few and same students participates in class • getting students attention during recitations is challenging • interrupting the class discussion • playing while having online class • struggling in getting the attention of the students to participate in class • struggling in maintaining students' attention
Embracing Teaching and Technological Skills	<ul style="list-style-type: none"> • employing different strategies in catering students' differences • catering the individual differences through different learning opportunities • learning new strategies useful in online teaching that caters students learning needs • exploring varied ways of utilizing different technological platforms • sharing educational sites to students for interactive learning to happen • learning while having fun by employing game-based instruction activity • developing technological and operational skills in exploring internet and other websites
Experiencing intermittent and unstable internet connection	<ul style="list-style-type: none"> • having difficulty in delivering the proper lesson in class due to poor internet connection • losing internet connection during virtual class • challenging to sustain internet connection during demonstration • having problem with unstable internet connection • having limited internet connectivity • having interruptions during online classes • having problems in terms of gadgets and internet connection
Struggling in Finding Appropriate Teaching Strategies	<ul style="list-style-type: none"> • thinking always on the different strategies and activities that caters students learning needs • exerting more time to study the lessons • searching on activities to aligned to the topic being taught • having difficulty in dealing with students' individual differences and needs • feeling stressful in dealing with students' individual differences • feeling anxious in thinking of online teaching techniques and strategies
Learning Virtual Teaching Strategies with the Guidance of Cooperating Teacher	<ul style="list-style-type: none"> • performing well in online teaching while implementing the strategies learned from the cooperating teacher • receiving advice from cooperating teacher after teaching demonstrations • coping the challenges by learning and exploring technological platforms with cooperating teacher's guidance • exciting to learn in delivering the lessons accurately with cooperating teacher's company • having accommodating and responsive cooperating teachers

Facing Difficulty on Students' Lack of Participation

This theme is supported by the study of Alan et al. (2020) which stated that pre-service teachers encountered problems including poor interaction, students' lack of participation, and limited socialization. In the study conducted by Aziz and Kazi (2019), teachers perceived they had a significant influence in increasing student participation in class and acknowledged doing so in various ways, including through pedagogy, creating a safe and welcoming environment in the classroom, building close

relationships with students, encouraging speaking, and using humor to ease tension.

Furthermore, the findings of the study of Sánchez (2019) shows obstacles to participation and learning in educational settings that support inclusive educational methods. These barriers and obstacles include lack of teacher training, physical barriers, and the diversity of students. The existence of obstacles prevents



students from participating and learning in pre-service teacher's discussion.

Embracing Teaching and Technological Skills

Pre-service teachers had the opportunity to test their teaching abilities as well as exploring more techniques to hone them during their teaching practicum experience. Pre-service teachers were able to independently explore strategies and develop new ideas to provide information to students in this novel teaching and learning situation, which also increased their responsibility (Kadir & Aziz, 2021). Moreover, Rahmani (2021) revealed that the use of technology in online instruction has given pre-service teachers more opportunities to use and experiment with it. The utilization of different online tools such as Google Meet, Quizzes, and Google Classroom was mandated by the school, which had a favorable effect on the pre-service teachers. Through practice, pre-service teachers establish techniques and strategy to efficiently handle online classrooms and make greater use of the internet and numerous online platforms.

In connection to that, pre-service teachers agreed that having to learn how to use software and tools they had never used before to construct lesson plans and deliver synchronous instruction was the most pertinent and significant learning experience, they had during their teaching practice. Pre-service teachers expressed appreciation for the opportunity that this online teaching provided to explore and learn how to use various online platforms given the central role that technology played in this experience (Sepulveda-Escobar & Morrison, 2020).

Experiencing Intermittent and Unstable Internet Connection

Pre-service teacher experienced a challenge about technology in terms of internet connection. The internet was intermittent, and Zoom lagged, limiting the pre-service teachers in communicating with the students. This made it difficult for pre-service teachers to observe children's actions or progress (Jin, 2022). In fact, Olaniran et al. (2017) highlighted that majority of the pre-service teachers faced connection issue with the internet. Pre-service teachers encountered internet access related problems which refers to issues with an individual capacity to access e-resources due to a poor or unreliable internet connection.

In addition, this notion supports the study of Gurung (2021) who mentioned that one of the main struggles pre-service teachers in online education experience is the issue of internet connectivity. Online classes are not feasible without reliable internet connectivity. Conducting online classes is a difficult task for

some teachers, and some people cannot afford a reliable internet connection because of its high cost. The school, the instructors, and the students all experience issues with the internet connection.

Struggling in Finding Appropriate Teaching Strategies

Pre-service teachers experienced several difficulties in identifying appropriate teaching strategies for a virtual class. Pre-service teachers find it difficult to choose appropriate activities and teaching methods given these diverse attitudes and behaviors of students (Napanoy et al., 2021). Similarly, Kadir and Aziz (2021) highlighted that pre-service teacher found it challenging to identify and adapt content to fit students' unique needs. Not all pre-service teachers expected they would be capable of teaching online. Also, it is challenging for pre-service teachers to offer sufficient hands-on activities to their pupils.

Likewise, Al Abiky (2021) mentioned that the some of the challenges that pre-service teachers have when teaching online include the delivery of content, appropriate teaching strategies and online assessment techniques. Although the flexibility and continuity of learning offered to students by online and virtual classes are beneficial, the abrupt transition from traditional to remote learning and virtual teaching had an uneven impact on teachers.

Learning Virtual Teaching Strategies with the Guidance of Cooperating Teacher

Gaining professional experience requires collaboration with cooperating teachers. Pre-service teachers learned various approaches and techniques from them, learned about problems in the teaching profession, and realized the value of good communication skills. Also, pre-service teachers' self-managed classroom management, interactions with students, control over student behavior, and employment of different approaches and strategies significantly contribute to their professional experience (Ozdaz, 2018) Another study led by Ersin et al. (2020) highlighted that the online teaching experience was well-accepted by pre-service teachers. They were nervous when they first started their online practicum with their cooperating teachers. However, they quickly adjusted to the new situation and thought it was interesting. They experienced the support of their cooperating teachers, which enabled them to get over their fear and feel more competent about good classroom management. Also, the advice and guidance of their cooperating teacher helped them solve problems during online teaching in terms of classroom management and infrastructure.



Table 2

Major Themes and Core Ideas on the Coping Strategies of Pre-Service Teachers with the Pedagogical Transitions in Catering to Students' Individual Differences in the New Normal

Major Themes	Core Ideas
Maintaining Patience in Dealing with the Students	<ul style="list-style-type: none"> extending patience in dealing with students needing much patience in dealing with students manifesting forbearance in unexpected situations embracing patience in overcoming students' individual differences increasing patience in facing different challenges having patience in repeating lessons to students
Employing Technology Integration in Virtual Class	<ul style="list-style-type: none"> integrating educational technological application making use of varied educational activities and games creating video presentations as technological integration integrating technology by using varied resources and activities having quiz through google forms utilizing different websites and educational applications
Utilizing Differentiated Strategy in Virtual Class	<ul style="list-style-type: none"> employing differentiated instruction by employing various activities to students integrating activities that caters the different multiple intelligences of students utilizing differentiated activities to cater students' skills using differentiated activities to make class more entertaining providing activities in helping students understand the topic employing strategies that are engaging for the student to actively participate
Creating a Conducive Virtual Learning Environment	<ul style="list-style-type: none"> maintaining a conducive learning environment in online platforms having a peaceful and manageable environment creating a child-friendly environment that leads to students' active participation providing a conducive environment for learners to easily understand the lesson building connections with students in new normal education making students feel safe understanding students' differences and needs
Having a Positive Attitude	<ul style="list-style-type: none"> having a positive mindset to overcome difficulties being optimistic and positive in getting students attention thinking positively during unanticipated problem showing determination and optimism in teaching in the new normal portraying enthusiasm in teaching

Maintaining Patience in Dealing with the Students

This finding conforms to the study of Tajeddin and Alemi (2019) which emphasized that pre-service teachers believed that qualities of excellent instructors include patience. Pre-service teachers recognized the value of patience and advised being polite while repeating instructions to help children understand. For pre-service teachers, a good teacher is patient and nice to all their students. Similarly, Bülbül and Izgar (2018) stated that for the pre-service teachers, having patience with learners will be essential as diversity continues to rise. Additionally, learners encounter a variety of problems. Therefore, it is crucial to be patient when attending to their specific needs. Pre-service teachers also need to

be patient concerning class requirements, schedules, and modes of communication.

Employing Technology Integration in Virtual Class

Pre-service teachers integrate technology into the classroom to increase student success, provide a stress-free environment, improve students, foster interaction, and make the lessons more exciting. In addition, pre-service teachers regarded digital teaching tools as useful, captivating, and interesting. Also, digital teaching materials aid in teaching by making lessons enjoyable, producing creative, and useful content, making learning simpler, encouraging student participation, boosting student motivation, effectively communicating, and fostering a positive classroom



environment. Moreover, digital teaching materials are used by pre-service teachers to provide variety in their lessons because they are more effective and efficient (Demirkan, 2019). Likewise, Shand and Farrelly (2018) who mentioned that technology-integrated activities have been employed in certain pre-service teachers' lessons to boost student engagement while ensuring academic learning. Many institutions have adopted remote learning in several ways like using flipped classrooms, in-class online activities, modules, and hosting online class sessions.

Utilizing Differentiated Strategy in Virtual Class

Employing differentiated strategy was significantly more common among pre-service teachers. This is true because describing how you will deliver lessons to pupils is the main objective of the lesson plan. In particular, the differentiation process strategies were used by pre-service teachers more often than any other type of strategy. Moreover, students working in groups or pairs, visual and auditory activities, pacing, and reteaching with more practice were all strategies for process differentiation. Also, the group activity approach was the process differentiation technique that was most frequently used (Herner-Patnode & Lee, 2021).

The result is also parallel to the study of Kim (2020) who revealed that play and different hands-on activities are beneficial for the learning of young children, however it is challenging to do in online setting. Nevertheless, the pre-service teachers include different hands-on activities for the children, such as singing and dancing, cutting out shapes from a handout and constructing patterns, making an instrument out of leftover materials, and sketching pictures related to a specific topic. Moreover, creative thinking is needed to build developmentally appropriate strategies that engage students in a variety of hands-on online activities. Also, Cooper et al. (2020) which stated that preservice teachers designed and presented lessons to students that gave them practice adapting for various learning styles, using a range of assessments, encouraging student responsibility for learning, offering an alternate explanation, encouraging collaborative learning, and offering both suitable challenges and positive learning experiences for all students.

Creating a Conducive Virtual Learning Environment

To adapt to the new virtual learning environment that is conducive, they considered the pupils' diverse needs and tried to properly address them. Pre-service teachers also observed the learners' conduct to see what aroused their curiosity, made them appreciate their lessons, and helped them comprehend the lessons effectively. Further, they tried to understand the peculiarities and requirements of their culture. They tried to adapt their teaching methods and instructional activities (Mendoza, 2020). Consequently, Sharoff (2019) highlighted that conducive environment is characterized by being present, helping students learn, and enhancing their comprehension of the material while encouraging proactive and student-centered learning. These are considered fundamental components of teaching. Pre-service teachers need organization, structure, well defined boundaries, and explicit criteria for their students to succeed in an online course.

Further, the study of Darling-Hammond et al. (2020) emphasized that an essential element of an engaged virtual learning environment is collaborating with students in dialogues and encouraging peer-to-peer collaboration. Peer-to-peer interactive design promotes a sense of belonging and cooperation. With this information, future teachers create exercises for online lessons that encourage teamwork.

Having a Positive Attitude

Giving teachers the chance to obtain practical experience will help them feel more confident and competent, and it will also encourage positive attitudes. Additionally, while inclusive pedagogy and course content were the best indicators of pre-service teachers' attitudes, practical experiences and assignments helped them better understand the various special education needs. It also increased their willingness to accommodate these students in their classrooms (Pit-ten et al., 2018). This is also given support in the study conducted by Jin (2022) who mentioned that online teaching provides a setting for pre-service teachers to recognize difficulties and build resilience to employ different teaching techniques and strategies. Moreover, pre-service teachers exert efforts to employ various ways in order to meet the needs and interests of the learners in class.

Table 3

Major Themes and Core Ideas on the Insights of Pre-Service Teachers on Pedagogical Transitions in Catering to Students' Individual Differences in the New Normal

Major Themes	Core Ideas
Equipping Pre-Service Teachers with Professional Skills	<ul style="list-style-type: none"> • having orientation and seminars in dealing with students in the online setting • holding seminars suited for a virtual class • having training on different teaching methods • providing seminars on using different educational websites and games • offering additional training before deployment



Realizing One's Potential	<ul style="list-style-type: none"> • having self-efficacy in teaching online despite challenges • recognizing own's ability to teach online • discovering being efficient in manipulating technology • being able to teach diverse students in a virtual class • surpassing hardships through positive feedbacks • growing professionally while understanding the new normal
Improving Adaptability Among Pre-Service Teachers	<ul style="list-style-type: none"> • developing professionally by adapting and accepting changes in educational system • adapting to inevitable changes in educational system • portraying flexibility in teaching as adjusting to change • being flexible to cater the individual differences of students • seeking new knowledge to adjust to new trends in teaching • persevering in teaching students despite the destructions
Enhancing Creativity of Pre-service Teachers	<ul style="list-style-type: none"> • exploring teaching strategies and innovations to improve teaching • thinking beyond to explore different strategies • being creative in making PowerPoint presentations • being creative and innovative in making learning materials • being creative to cater students' individual differences

Equipping Pre-Service Teachers with Professional Skills

Pre-service teachers contend that they still lack the essential abilities to carry out their assigned jobs, despite the effort of the institution to prepare them for their pre-service teaching. Hence, pre-service teachers recommended that they require more training in creating daily lesson plans and school forms. They also suggested that workshops or seminars on resilience and interpersonal skills would be most beneficial, as well as teaching methods to assist pre-service teachers (Napanoy et al., 2021). Similarly, Hunter-Johnson et al. (2021) cited that professional development for pre-service teachers is essential since the recent shift from face-to-face instruction to online education. Also, effective continuous engagement and training of educational technology is necessary for pre-service teachers to complete a successful teaching practicum. Further, to advance their knowledge and experience using digital technologies to support their teaching in classrooms, pre-service teachers need training opportunities.

Furthermore, Zilka (2021) highlighted that the understanding of the difficulties that the pre-service teachers encountered in the processes of online teaching and learning in digital environments enables training programs to meet the needs of various learners and build collaborative learning communities. In addition, the key to using digital environments effectively is to select the right pedagogy for the needs of the learners and the content itself.

Realizing One's Potential

To stimulate pre-service teachers' attention and support them realize their teaching potential, certain efficient methodologies on technological, pedagogical, and content knowledge (TPACK) were implemented. Also, it is believed that in order for pre-service teachers to meet the challenges in the context of education, they must have a clear understanding of the technology pedagogical content knowledge for teaching practice (Singh and Kasim, 2019). Moreover, Zhakipbekova (2018), examined the

issues of training pedagogical pre-service teachers for future employment in inclusive educational institutions. It is concluded that establishing pedagogical conditions at the higher school and developing learning technologies that bridge the gap between theoretical and practical knowledge are the authentic ways to address the challenges of realizing teachers' pedagogical potential. One of the factors that will help teachers reach their pedagogical potential is the role of socio-emotional barriers, such as coping with uncertainty and transforming an individual instructional failure into a shared opportunity for teachers to learn (Vedder-Weiss et al., 2018).

Improving Adaptability Among Pre-service Teachers

In order to provide the greatest services to the pupils, teachers had to overcome any challenges and swiftly adjust to any teaching circumstance. The experiences of pre-service teachers in teaching online taught them that they would need to continue learning to address the predicament they faced, especially those pertaining to the use of technology and efficient teaching methods (Rahmani, 2021). In addition, Sepulveda-Escobar and Morrison (2020) cited that pre-service teachers valued their ability to adapt to new and unfamiliar situations. Aside from that, they also value their ability in dealing with unanticipated issues, gaining knowledge from the experience, and positively seeing the pandemic's effects on education.

Enhancing Creativity of Pre-Service Teachers

The content delivery was prompted by this new situation as some of the pre-service teachers experimented on their own to be more innovative and creative. Also, a group of pre-service teachers worked together to share resources and use a mobile application to distribute the materials to students and make them understandable (Al Abiky, 2021). Besides, Sepulveda-Escobar and Morrison (2020) stated that pre-service teachers had to look for new ideas and mechanisms to actively engage with students in a virtual class. Further, they acknowledged that while they had



to learn how to communicate with their students using new technological platforms, it had also given them more autonomy in their work because they had to come up with new ways to create educational content.

More so, Astuti et al. (2019) emphasized that creativity and innovation encourage the formation of the character of pre-service teachers to have the ability to develop, implement, and provide new ideas to others, as well as being open and responsive to different new perspectives. To enhance these skills, work product associated with teaching materials and the environment they live is required.

IMPLICATIONS FOR TEACHING PRACTICE

The pedagogical transition to the new normal posed significant challenges for pre-service teachers, as highlighted in interviews revealing issues such as intermittent internet connectivity, student disengagement, and difficulty in adapting teaching strategies to virtual settings. These hurdles notably impacted their teaching demonstrations. To address these challenges, it is crucial to modify teaching strategies to suit virtual environments and promote student participation. Pre-service teachers should actively explore diverse teaching approaches, utilize educational tools and platforms, and undergo pedagogical technology training to stay abreast of evolving educational trends. Moreover, intervention programs and webinars can play a vital role in mitigating the challenges encountered during the pedagogical transition to the new normal, fostering a more effective teaching experience for pre-service educators.

CONCLUSION

This study focuses on the experiences of the elementary pre-service teachers in the pedagogical transitions to the new normal that focuses on the individual differences of elementary learners. From the varied and detailed responses shared by the pre-service teachers, I gleaned valuable understandings of their experiences, the coping strategies they employed, and the beneficial results they achieved through this unique educational journey.

Firstly, the results of this study underscore the importance of providing comprehensive training and support for pre-service teachers in adapting to the new normal of virtual teaching environments. This includes not only technical skills but also pedagogical strategies tailored for online instruction. Secondly, the study highlights the necessity of fostering resilience and patience among pre-service teachers to navigate challenges such as student disengagement and technological difficulties. Thirdly, it emphasizes the significance of promoting creativity and adaptability in teaching approaches, particularly in virtual settings where traditional methods may not suffice. Additionally, the insights gained from this study can inform curriculum development and training programs for pre-service teachers, ensuring that they are equipped with the necessary skills and mindset to thrive in evolving educational landscapes. Lastly, it calls for collaboration among stakeholders such as cooperating teachers, Higher Education Institutions' administrators, and

regulatory bodies like the Commission on Higher Education to provide holistic support and resources for pre-service teachers' professional development in the new normal.

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A NOVEL IoT BASED AIR AND WATER QUALITY MONITORING SYSTEM

Rabi Arunachalam, Muthu Ganesan, Ayyappa Srinivasan M G

St.Mother Theresa Engineering College,Thoothukudi, India

ABSTRACT

The four main types of pollution caused by industries are air pollution, water pollution, soil pollution, . Globalization and industrialization are throwing off untreated harmful and toxic elements into the atmosphere, which has led to the contamination of fundamental ecosystem elements like water, air, and soil that humans depend on for survival. This causes infections that can spread to humans and animals through the air and water. Controlling these pollutant characteristics is therefore quite difficult. The major goal of this project is to design an effective and reliable system to monitor the parameters that are creating pollution. This paper provides an industrial Internet of things (IoT) based air, water, and sound pollution monitoring system. This project's/system's working approach is to read and track pollution parameters, alerting pollution control authorities when any of these pollutants are released in excess of what is considered acceptable by the industry. Using a variety of sensors, including PH, MQ6, MQ9, temperature, humidity, noise, and dust density sensors, the system analyzes the amount of PH in industrial effluents, the level of CO, carbon dioxide, combustible gas, humidity in the air, and the minute optical dust particles released during industry processes. It also assesses the amount of sound produced by the industry. The system uses wireless technology (i.e., the Internet of Things) with a GPRS modem and cloud technologies to record the values of pollutants released at a specific date and time. It also notifies the environmental pollution monitoring authorities via email and SMS when there is an increase in emissions.

KEY WORDS: Co, Mq6, Mq9, Iot, Gsm, Gprs, Dust Density Sensor, Cloud Technologies,

1.INTRODUCTION

A significant and critical aspect that is adversely affecting millions of people's quality of life is pollution. This leads to the majority of environmental contaminants. A significant and critical aspect that is adversely affecting millions of people's quality of life is pollution.

With the world's population rising and industries developing, environmental pollution has become a major concern. The majority of pollutants in the environment come from untreated emissions and the discharge of industrial waste from factories into the environment. Three main categories of pollution are mostly caused by the manufacturing and processing sectors by air and water

Air pollution results from the release of a significant amount of untreated industrial waste, including carbon dioxide, carbon monoxide, sulfurous oxides, nitrous oxides, optical dust, and minute particulate matter. Additionally, a significant amount of polymer vapours, such as methane and butanes, are released into the atmosphere when burning coal, natural oils, fossil fuels, and petroleum products for industrial processing. According to estimates from the Indian Pollution Control Authority, airborne illnesses claim the lives of around 1.2 million Indians annually.

Similar to this, the main cause of industrial water pollution stems from the release of untreated industrial waste produced during different processing operations. Examples of industrial waste

include asbestos, lead, mercury, nitrates, phosphates, sulfur, and other petrochemicals. Untreated acidic wastewaters that are dumped into natural reservoirs lower the pH of the water in the reservoir, which reduces microbial activity and inhibits the growth of algae and other aquatic plants, which lowers the BOD level.

One of the most effective instruments in today's technology is the Internet of Things (IoT), which enables data access from far-off places and cloud storage. As pollution levels rose and sophisticated technology proliferated, a number of novel approaches were developed to monitor the swift rise in pollution more effectively. One such approach that saw significant success in this area was the Internet of Things. The Internet of Things (IoT) has become the most widely used instrument for information exchange amongst devices connected to the internet due to the rise in the use of the internet and gadgets that operate on the basis of artificial intelligence.

This study offers a GSM and GPRS based pollution monitoring system that enables us to track the amount or level of pollutants released by different industries in different areas. The system uses a variety of sensors, including temperature, humidity, dust density, noise, MQ-6, MQ-9, PH, CO, CO₂, combustible gas, humidity in the air, and the amount of minute optical dust particles released during the industrial manufacturing process, to collect various analog data, including the level of PH in industry effluents, CO, CO₂, combustible gas, humidity in the air, and the



level of minute optical dust particles released during the industrial manufacturing process.

Additionally, the system logs the amounts of pollutants released at a specific date and time. It also notifies the environmental pollution monitoring authorities via email and SMS when emissions exceed pre-established industrial standards, allowing for additional control measures to be taken over pollution release.

II. LITERATURE SURVEY

[1] Prem Kumar S. and Zumyla Shanaz looked into "IoT-based Industrial Pollution Monitoring System." In order to provide a healthy atmosphere for industry workers, the author suggested developing a reliable system that continuously monitors the air quality surrounding the industry by measuring the amount of different pollutants generated during the industrial process with less human interaction. Here, the author analyzed the amount of CO, CO₂, and smoke quality discharged into the atmosphere using MQ-6 and MQ2 sensors. GSM technology was utilized to facilitate the data interchange between the sensors and the monitoring authority.

[2] Karan Kapoor, Ms. Aarathi, spoke on "Air and Sound Pollution Monitoring System Using IoT." The author of this study creates a system that uses a variety of sensors, such as the MQ-135 to measure the amount of CO₂ in the atmosphere, the DHT11 sensor to measure temperature and humidity, and the LM393 sensor to measure sound intensity, to monitor the quality of the air and the level of noise generated during industrial processes. The Raspberry Pi 3B module, an ARM-based credit card-sized SBC (Single Board Computer) with an integrated Wi-Fi and Bluetooth module, is used to integrate the system. Through the Internet of Things, the author employed GPS technology to transfer data from the sensors to the designated places.

[3] Deepa Jose and Kavitha B.C. B.C. proposed a "Raspberry Pi-based Internet of Things Pollution Monitoring System." In this instance, the author creates a system that includes a number of sensors, including MQ-6, MQ-7, MQ-135, LDR, and DHT11 sensors, to track the presence of different pollutants, such as carbon monoxide, carbon dioxide, smoke, and butane. The system also tracks the rise in atmospheric temperature and humidity brought on by the release of pollutants. The Raspberry Pi microcontroller, which has an integrated WiFi module, is used. When pollution emissions above the pollution board's predetermined thresholds, the system continuously monitors data on the amount of pollutants in the atmosphere and notifies the relevant authorities.

[4]. The topic of "Designing an IoT-based air quality monitoring system" was covered by T H Nasution and M A Muchtar [4]. In order to exchange data from the sensors, the author of this research developed a system using a variety of analog sensors, including the MQ-135, MQ-7, and dust density sensor. The Arduino microcontroller is connected to an ESP822 Wi-Fi module. The author also used a mobile application called

ThingsSpeak cloud, which stores the data collected by the sensors in cloud storage and facilitates access to the data recorded even in remote locations.

[5] "Design and implementation of IoT based Portable Outdoor Dust Density Monitoring System" was the idea put forth by Mahammad D.V. Here, the author uses an Arduino microcontroller interfaced optical dust density sensor to measure the amount of minute optical pollutants in the form of microparticles. The data is transmitted through the internet of things, a smartphone application known as the Blink app, and a Wi-fi module being utilized.

[6] "An IoT Based Automated Noise and Air Pollution Monitoring System" was the idea put out by Palaghat Yaswanth Sai. with the intention of keeping an eye on the level of noise pollution and the state of the air in hospital and school zones. The sensors are connected to an Arduino microcontroller with an integrated Wi-fi module slot. The author employed an LM393 sensor to obtain the analog data of the noise and a MQ-135 sensor to monitor the presence of any dangerous or combustible chemicals, such as butane or LPG. Data is transmitted to the authorities using the ESP8266 Wi-fi module and a mobile application.

[7] B. Koteswarrao and Vennam Madhavireddy presented a "smart water quality monitoring system using IoT." Here, the writers created a system that continuously assesses the water's purity. The suggested system is made up of a number of sensors, including a temperature sensor to gauge the water's temperature, a pH sensor to determine the water's pH, a water level sensor, and a CO₂ sensor to determine the percentage of CO₂ dissolved. The Arduino microcontroller and Wi-fi module are interfaced with these sensors to enable data transmission from the sensors to the user via the internet. In addition, the system notifies the user of any alarms and logs the comprehensive information gathered by the sensors at a certain date and time.

[8] The "IoT Based Low-Cost System for Monitoring of Water Quality in Real Time" concept was developed by Anuradha and Bhakti with the intention of monitoring several water parameters in order to gauge the level of pollution in the water. The system uses a Raspberry microcontroller to interface with various sensors, including a turbidity sensor that counts the number of particles dissolved in the water, a pH sensor that gauges the water's pH, and a temperature sensor that detects changes in water temperature that could lead to thermal pollution. Sensor data is transferred from the device to the user via a Wi-fi module and the smartphone app ThingsSpeak, which allows for device position tracking and sensor logging.

[9] The authors of this research developed a system that includes sensors such as pH, turbidity, temperature, and flow to measure various parameters like the presence of minute particles in the water, pH of the water, water flow, and temperature of the water. The sensors are controlled by an Arduino microcontroller and a



Wi-fi module to transmit data received from the sensors to the user. Vaishnavi V. Daigavane and Dr. M.A. Gaikwad proposed the "Water Quality Monitoring System Based on IoT." The information is shown on the webpage. The system automatically notifies the user through warning messages if any parameter exceeds its predetermined value.

III.THE PROBLEM

The creation of a reliable industrial pollution monitoring system that tracks the levels of all pollutants produced on a given date and time, along with monitoring all forms of pollution, is vital. In order to further regulate the discharge of pollutants, the system must also have the capability to transmit warning notifications to the environmental pollution monitoring authorities when there is an increase in the emission.

IV.PROPOSED SYSTEM

An "IoT based industrial air, water, and noise pollution monitoring system" is presented in this study. The following techniques are employed by the suggested system to monitor the four different types of pollution that are brought about by the industries.

1. By analyzing the levels of carbon dioxide and carbon monoxide, flammable gases like butane and LPG, humidity in the surrounding air, and the presence of minute particulate matter like optical dust that is released during industrial processes, air pollution is monitored using MQ-6, MQ-9, humidity, and dust density sensors.
2. A pH sensor is used to monitor water pollution by determining the industrial waste effluents' pH before discharging them into a natural reservoir.

A microcontroller called the Arduino Mega 2560 is used to interface all five sensors. The digital data that the sensors' analog data is transformed to allows for data transmission across the internet of things via a GSM modem and an Android mobile application. In addition, the suggested system sends alerts and warnings to the user's email and SIM card at specific times based on the sensor data.

V.METHODOLOGY

The block diagram of the system has been shown in fig.1.

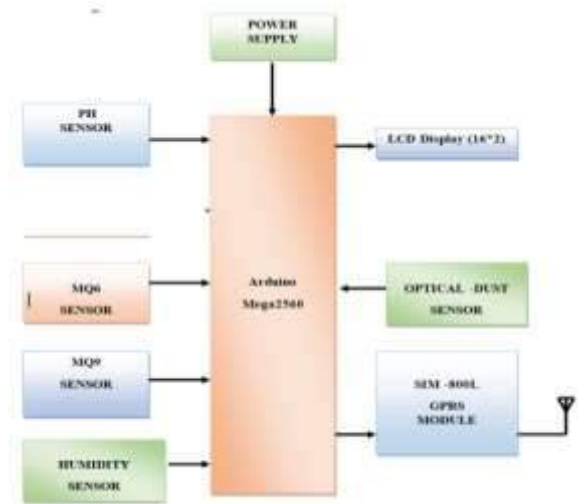


Fig.1.Transmitter section of proposed system

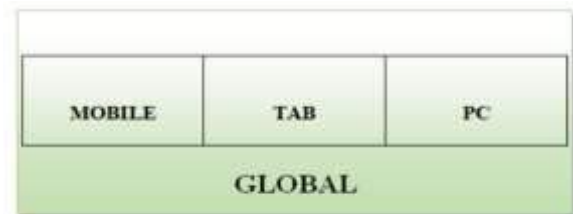


Fig.2. Reciever Section

The transmitter segment and the reception section are the two parts of the system. The transmitter section is made up of an Arduino Mega 2560 microcontroller-interfaced power supply unit that powers the system as well as a number of analog sensors, including temperature, humidity, dust density, noise, and PH, MQ-6, and MQ-9 sensors. The data is sent over the internet to the receiver part using the GPRS module. Typically, the receiver component consists of a smartphone on which an embedded C and Android programming are used to construct the project's webpage application.

The data received from the transmitter section is shown and recorded in the receiver part. It also shows the email and SMS notifications that the transmitter section sends. In order to regulate environmental pollution, the receiver section may consist of the industry's owner or the pollution control authorities that monitor industrial emissions.

To power the system, the power supply unit is initially turned on. In order to establish connection between the transmitter and receiver sections over the internet, both sections need to be linked to Wi-Fi. The system's sensors have been initialized. The sensors record data from the industrial setting. For instance, the MQ-6 sensor records analog data about the concentration of flammable gases like butane and LPG. Similar to the MQ-9 sensor, the temperature, humidity, pH, dust density, and noise sensors all record analog data about the presence of carbon monoxide and carbon dioxide, as well as the temperature of heat-treated water,



ambient humidity, industrial effluent pH, and the amount of optical dust particles in the atmosphere.

The microcontroller Arduino Mega 2560 receives this analog data. The sensor's analog data is converted to digital data by the Arduino Mega 2560 microcontroller, and the corresponding data values are shown on the LCD panel. Using the internet, the GPRS module sends the data to the receiver section's project webpage. On the webpage of the receiving section, a table represents the data series that was acquired from the transmitter section.

When the values of any specific data obtained by the sensors go above the preset value, indicating an increase in the emission of the respective pollutants by the industries—for example, if there is an increase in the emission of CO by the industries—the MQ-9 sensor captures high-value analog data, which is then converted into high-value digital data. This allows the transmitter section to send warning messages to the recipient's email or mobile SIM. The Arduino microcontroller transmits an alarm about the rise in CO emissions from the industry when it compares the data from the sensor with the predetermined value.

V. HARDWARE DESCRIPTION

1. Power Supply Unit:

Power supply unit has been shown in fig.2.

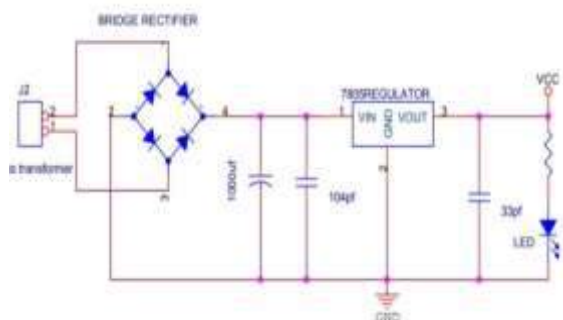


Fig.2. Power supply Unit

At first, the adapter had 5.5mm AC connectors and a 9V/1A output power. The bridge rectifier in the power supply unit's circuit rectifies the main AC input to the DC output, converting 9V AC power to 5V DC power that is supplied to the system. A 1000µF filter capacitor is connected in parallel with the rectifier's output to create a linear power supply. It is employed in the circuit to filter out undesirable frequencies. The bridge rectifier and 7805 regulator are linked in parallel to supply the system with a steady voltage and an LED light to show when power is present.

2. MQ-9 sensor:

The MQ-9 Sensor measures the amount of CO present in the atmosphere. In addition to being highly sensitive to CO, the MQ-9 sensor is also capable of detecting a wide range of other gases that contain CO.

When the concentration of gases increases, the conductivity of the sensor increases from its initial low value in clean or neat air. 5V is the maximum operational voltage.



Fig.3. MQ-9 Sensor

3. MQ-6 Sensor

The MQ-6 Sensor is used to measure the concentration of natural gases as well as other flammable gases like as propane, butane, and LPG in the atmosphere. The MQ-6 sensor has a detection range of almost 200 to 10,000 parts per million for gases. The analog resistance determines the sensor's output. There is a 5V maximum operational voltage.

4. pH Sensor

Before releasing industrial effluents into a natural reservoir, the pH sensor is used to evaluate the acidity or alkalinity of the wastewater. The potential of hydrogen, which is a measure of the presence of hydrogen ions, determines pH. 0 to 14 is the range of the pH scale, which classifies pH values as acidic (1-6), neutral (-7), and basic (e.g., 8-14). Industrial effluents with significant concentrations of lead and mercury have an acidic pH of 2-3, but effluents containing asbestos have a higher pH of 12-14. The pH sensor measures the wastewater's acidity or alkalinity before releasing industrial effluents into a natural reservoir. pH is determined by the potential of hydrogen, which is a measurement of the existence of hydrogen ions. The pH scale, which divides pH values into acidic (1-6), neutral (-7), and basic (e.g., 8-14) ranges from 0 to 14. The pH of industrial effluents containing asbestos is higher at 12-14 than that of effluents with considerable lead and mercury contents, which are acidic at 2-3.



Fig.4 pH sensor

5. Arduinomega 2560 Controller

Fifty-four of the microcontroller's digital pins (of which fifteen can be used as PWM outputs) are found on the Arduino Mega 2560. It has four UARTs hardware serial input, a reset button, an ICSP header, a USB jack, a 16 MHz crystal oscillator, and sixteen analog inputs. It can be powered using an AC to DC adapter or with a USB cable. 5 volts is the operational voltage. There is a 6-20 volt maximum input voltage limit. In terms of physical size, it is larger than any other Arduino microcontroller. It also offers more flexibility for handling massive amounts of data or memory.



More sensors can be used with it than with any other Arduino board.



Fig.5.Arduino controller

6.SIM 800L GPRS Modem:



Fig.6.SIM800L GPRS Modem

The SIM 800 is a quad-band GSM/GPRS module that operates at the 850MHz GSM frequency. It has two ports: one for updating firmware and debugging, and the other is a USB port for the universal asynchronous receiver/transmitter. Additionally, it has a number of audio channels, including receiver output and microphone input. The single SIM card slot on the SIM 800 is integrated with the TCP/IP protocol. It uses between 3.4 and 4.4 V of power to run. The SIM800L is used for internet-based data transmission and reception, audio calls, and message sending and receiving.

Circuit Description

The circuit is shown in fig 7.

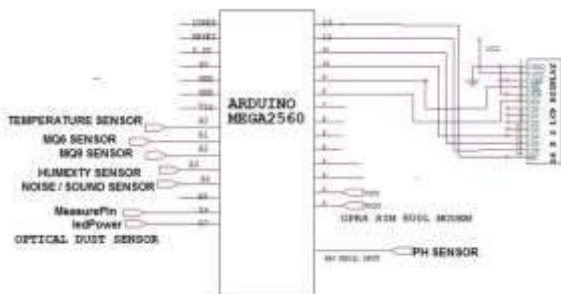


Fig.7.Circuit Connection

The schematic depiction of the complete system is displayed in the above figure. The Arduino Mega 2560 microcontroller and the sensors are powered by a USB cable that is connected to a laptop or power bank. The connections are made by soldering the wires using a flat circuit board to reduce the possibility of loose connections. The LCD panel and the GPRS modem are powered by the main power supply unit. When using an adapter with 5.5mm AC plugs and a 9V 1A output power, the circuit of the power supply unit is made up of a bridge rectifier, which rectifies the primary AC input to the DC output, converting the 9V AC power to a 5V DC power.

VI.RESULTS

The Results taken at various air and water condition are shown in fig.8 and fig.9



Fig.8.Gas sensor output



Fig.9.pH sensor output

Fig.10.showshardware prototype.



Fig.10.Hardware prototype

VII.CONCLUSION

The purpose of the "Iot based industrial Air, water, and Noise pollution monitoring system" is to cost-effectively and extremely securely monitor and regulate the pollution produced by the emission of hazardous, untreated industrial pollutants. With seven sensors interfaced to an advanced controller that gathers and records real-time data on the various pollutants released by industries, this system is more effective than the previous one in helping environmental pollution control authorities monitor industrial environmental conditions. The purpose of the "Iot based industrial Air, water, and Noise pollution monitoring system" is to cost-effectively and extremely securely monitor and regulate the pollution produced by the emission of hazardous, untreated industrial pollutants. This system works better than the current one.



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SMART ECG MONITORING SYSTEM DRIVEN BY IOT

Ajishlin.P.S, Mukesh.P

St.Mother Theresa Engineering College,Vagaikulam, Thoothukudi

ABSTRACT

With the exponential rise in the human population and medical costs, public healthcare has received more and more attention. It is commonly recognized that a proficient health monitoring system has the ability to promptly identify irregularities in medical conditions and provide diagnoses based on the collected data. ECG monitoring is a key diagnostic tool that is extensively researched and used. But almost all of the portable ECG monitoring devices on the market today require a mobile application to function; this application handles data collecting and display. In this work, we suggest a novel approach to ECG monitoring that makes use of Internet-of-Things (IoT) technologies. Wearable monitoring nodes are used to collect ECG data, which are then wirelessly transferred to the Internet of Things cloud. The Internet of Things cloud uses both the HTTP and MQTT protocols to give consumers access to real-time and visually represented ECG data. The cross-platform problem has been significantly mitigated by the ease with which ECG data may be obtained by almost any smart terminal equipped with a web browser. To ensure that the system as a whole is reliable, experiments are conducted on healthy volunteers. Experimental results reveal that the proposed system is reliable in collecting and displaying real-time ECG data, The suggested system can help with the primary diagnosis of several heart disorders since it is dependable in gathering and presenting real-time ECG data, according to experimental results.

INTRODUCTION

Over the past few decades, heart disorders have become more common, and many individuals pass away from related illnesses. Heart illness should therefore not be taken lightly. Over the past ten years, chronic and cardiovascular diseases (CVDs) have been the leading cause of death in every nation. Heart and blood vessel diseases are known as CVDs. Blood vessel diseases are referred to as cardiovascular diseases (CVDs) and include coronary artery diseases. Heart failure, rheumatic heart disease, cardiomyopathy, stroke, and heart attack. Among the disorders affecting the heart are arrhythmias. With 17.9 million deaths annually, cardiovascular diseases (CVDs) are the world's leading cause of mortality. With more than 8,40,000 deaths in 2016, it remains the greatest cause of death in the US. Additionally, based on the European Health Network European Report 2017

Cardiovascular Disease Statics, or CVDs, account for roughly 1.8 million deaths annually in the European Union (EU) and 3.9 million fatalities in Europe. This represents 37% of all deaths in the European Union and 45% of all deaths in Europe. In today's healthcare, continuous heart rate monitoring and rapid heartbeat identification are crucial priorities. Therefore, keeping an eye on physiological signs such as electrocardiogram (ECG) signals. Indications offers a fresh, comprehensive framework for evaluating CVD and supporting illness prevention and control. Thanks to advancements in sensor technology, communication infrastructure, data processing, modelling, and analytics algorithms, the risk of impairments can now be more effectively addressed than in the

past. Thus, a new era of astute, proactive healthcare would eventually become available, especially in light of the major challenge of scarce medical resources. The Internet of Things is expected . A mobile ECG monitoring solution based on the cloud was showcased. These can use a sensor to detect ECG signals and wireless transmission technologies like Bluetooth, Wi-Fi, and Low-power wireless to send those signals on a screen. An ECG tracking apparatus that is wearable and uses Wi-Fi to send data wirelessly to the Internet of Things cloud, eliminating the need for a mobile terminal. Wi-Fi has greater coverage regions and better data speeds than Bluetooth or Zigbee.

Using smartphones running different operating systems, a web-based graphical user interface is designed to make it easy for physicians and patients to access data services provided by the IoT cloud. IoT works on electrocardiograms are numerous. In An Arduino and GSM module were used to construct a framework for an old patient living alone at home, which is intended to detect heart problems or declines in the patient's state. The framework was developed using Arduino and GSM modules, and it sends data to the specialist via SMS on a cell phone. If the body vibration signals and echocardiography are abnormal, the framework notifies the pre-specified expected individuals or a medical facility. Their approach uses the cloud as a means of sending ECG data to a display device and a Raspberry Pi microcontroller. There are still issues with this system, like the need for a strong internet connection in order for doctors to use it whenever they want. proposed a system that, in the event that an abnormality is found after an ECG analysis, can notify users and medical professionals.

IOT-BASED ECG MONITORING SYSTEM ARCHITECTURE

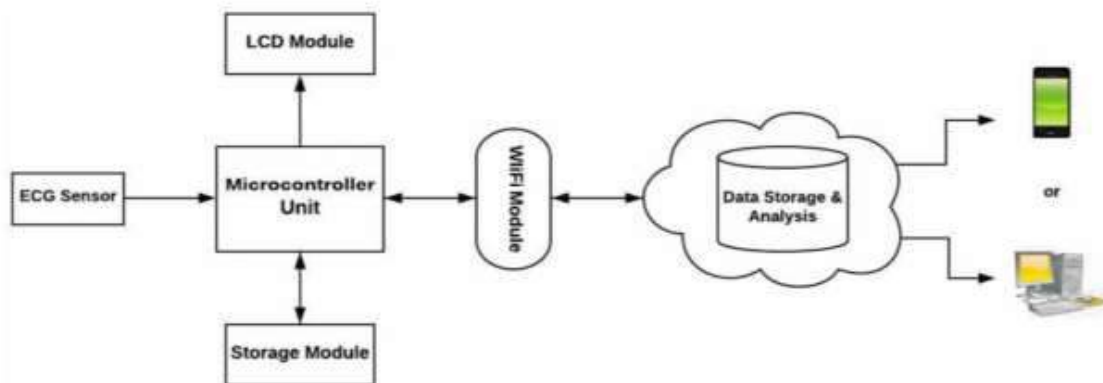


Fig.1.IoT based ecg Monitoring System Architecture

Network For Data Collection

The foundation of the entire framework, which is dedicated to collecting anatomical data from the body's surface, is the data gathering structure. The Wi-Fi convention is used to transmit the ECG data collected from the sensors to the Internet of Things cloud since Wi-Fi protocol may provide greater data esteems and more expansive inclusion zones.

Data Display and Storage

Since an SD card's design operates at a low voltage and its communication is based on an advanced nine-pin interface, it is a highly suited device for storing ECG data offline. The Real Time ECG Wave is shown via an interfaced thin-film transistor (TFT) LCD.

Server in the Cloud

With the advancement of sophisticated Internet-of-Things systems, the ECG data may be successfully stored and inspected in sufficient quantities. An Internet-of-Things cloud allows information activities and inspections to be conducted on high-power servers, significantly reducing the amount of smart devices that are needed.

Interface for Graphical Users (GUI)

Perception and administration of information fall under the purview of the Graphical User Interface. It provides a module that is simple to understand; a module for communication; and a module for offline storage. Three components make up the architecture of the Internet of Things-based ECG Monitoring System: Ubidots, NodeMCU ESP8266, and AD8232 ECG Sensor.

ECG Sensor AD8232

The procedure known as electrocardiography, or ECG, is used to collect electrical impulses produced by the heart. The ECG sensor helps us identify the degree of physiological arousal in individuals, but it also helps us comprehend their psychological states. In order to determine the heart's electrical activity, an AD8232 sensor is employed. This little chip's electrical activity may be graphed similarly to an electrocardiogram (ECG). Electrocardiography is a useful tool for identifying a variety of cardiac diseases.

A commercial board called the AD8232 ECG sensor is used to measure the electrical activity of the human heart. The result of this activity is an analogue readout, which may be plotted like an ECG. The AD8232 chip can be used to lessen the noise produced by electrocardiograms, which can be highly loud. The ECG sensor functions similarly to an operational amplifier in order to facilitate the simple extraction of a clear signal from the intervals. The AD8232 sensor is employed in several biopotential measuring applications, including signal conditioning in electrocardiograms. This chip's primary function is to capture, filter, and amplify tiny biopotential signals in noisy environments, such as those created when a distant electrode is replaced.

The pins SDN, LO+, LO-, OUTPUT, 3.3V, and GND are included in the heart rate monitoring sensor, such as the AD8232. In order to solder pins on this IC and attach it to development boards like Arduino. In addition, this board has pins for connecting custom sensors, such as the left arm (LA), right leg (RL), and right arm (RA). This board has an LED indication that shows the rhythm of a human pulse. The AD8232 sensor has a rapid restoration capability that is utilised to shorten the HPFs' long resolving tails. This sensor comes in a 20-lead LFCSP package and is available in a 4 mm x 4 mm dimension. It functions between -40°C and +85°C, although the performance



Fig.2 ECG Sensor



MCU Node ESP8266

Node MCU is an open-source development board and firmware with Lua programming specifically designed for Internet of Things applications. It consists of hardware based on the ESP-12 module and firmware running on Espressif Systems' ESP8266 Wi-Fi SoC. This board has a Wi-Fi module and a microprocessor. 3.3 V is the voltage at which the ESP8266 operates. This board's single-board microcontroller has 12 GPIO and D0 on it . It is a 32-bit microcontroller that lacks reinforced open drain, interrupt , PWM, and 1-Wire functionality. It has a 128-byte memory and a 4-million-byte storage capacity. ESP8266 is a commonly used Wi-Fi module in Internet of Things applications that is combined with the TENSILICA XTENSA LX106 core.



Fig3.MCU Node

Ubidots

With the use of Ubidots, System Integrators (SIs) and small and medium-sized businesses (SMBs) may quickly develop and implement IoT applications. The building components of Ubidots include alarms, device-friendly APIs, analytics, reports, and drag-and-drop dashboards.

Table I: According to [7], comparison among typical ECG Sensing Networks such as Wi-Fi, Bluetooth, and ZigBee.

Standards	Wi-Fi based sensing network	Bluetooth based ECG sensing Network	ZigBee-based ECG sensing network
Protocol	IEEE 802.11	IEEE 802.15.1	IEEE 802.15.4
Coverage	100 m	10 m	10-100 m
Data Rates	54 Mbps	1 Mbps	250 Kbps
Power Consumption	Medium	Low	Low
Terminal Dependency	Data collection in dependent of smart terminals	Smart terminals are needed for receiving and forwarding sensed data	Smart terminals needed for receiving and forwarding sensed data

Circuit Diagram: Connecting NodeMCU ESP8266 to AD8232 ECG Sensor

This is the circuit schematic for connecting the NodeMCU ESP8266 to the AD8232 ECG sensor. The AD8232 Breakout Board has six pins. SDN is not linked

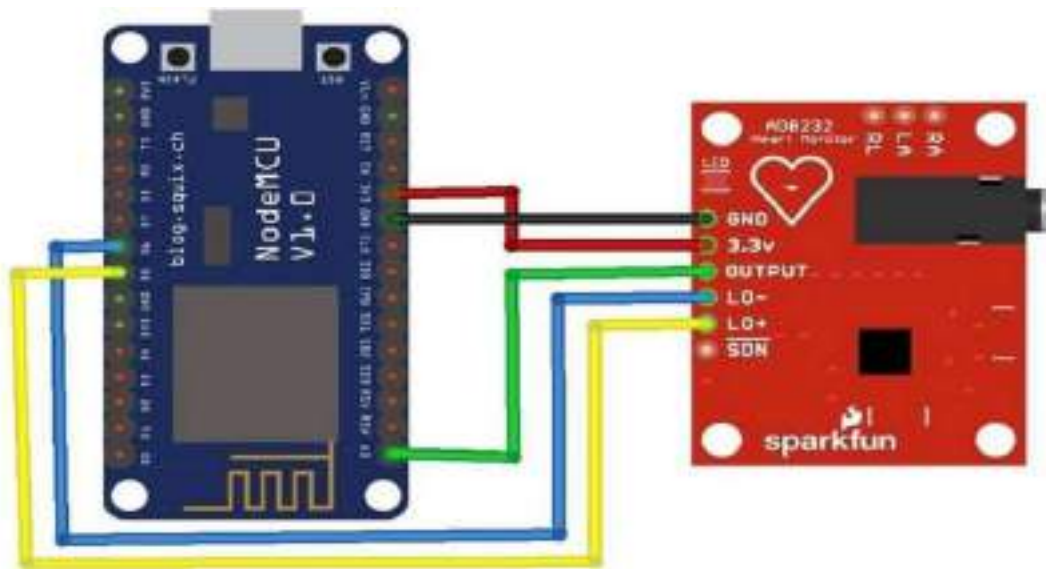


Fig.4.Circuit Diagram

Attach the output to Node MCU's analogue A0 port. Attach the LO+ and LO- to NodeMCU's D5 and D6, respectively. Connect the GND of the AD8232 kit to GND and provide it with 3.3V VCC.

C. Positioning ECG Leads and Electrodes
Prior to applying to the body, it is advised to snap the sensor pads onto the leads. The pads provide better measurements the closer they are to the heart. To assist in determining correct placement, the cables are color-coded.

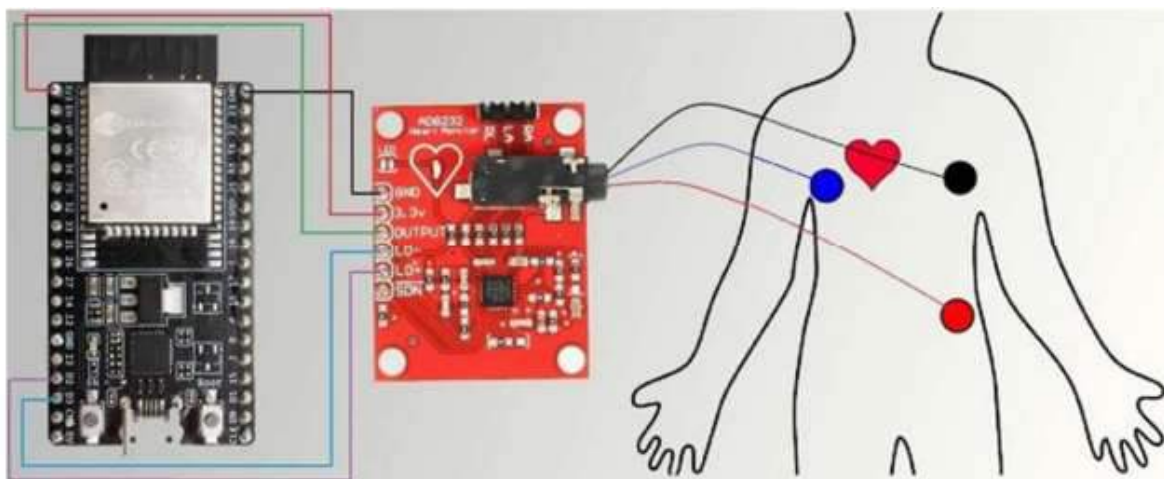


Fig5..Connection with Heart

ACADEMIC OUTCOME AND ANALYSIS

Comparing a 3-lead placement to a traditional 12-lead ECG monitoring equipment used in hospitals, it is sufficient to analyse the key aspects of the ECG signal. The electrodes must be positioned in a triangle around the heart in order to get the greatest possible ECG data. We have tested our technology on a number of patients in order to validate its functionality. The five primary wave types found in typical ECG readings are the P, T, Q, R, and S waves.

1) *RR Interval*: The R wave is one of the most noticeable features and is frequently used to determine the ECG signal's period. The time gap between two consecutive R waves is known as the RR interval, and it can become abnormal in certain cardiac conditions, such as arrhythmia.

2) *PR Interval*: This quantifies the amount of time that passes between the start of the P wave and the QRS complex. It shows how long it takes for an impulse to get from the sinus node to the ventricles.

3) *QT Interval*: This term, which is associated with ventricular depolarization and repolarization, denotes the period of time between the beginning of the Q wave and the conclusion of the T wave. If the QT interval is longer than usual, there is a higher chance of ventricular fibrillation or perhaps sudden cardiac death.

4) *QRS Complex*: The three major waves that make up the Ventricular Depolarization—the Q, R, and S waves—are primarily linked to the QRS complex. Certain disorders

including medication toxicity and electrolyte imbalance are likely to be identified by QRS complex analysis.

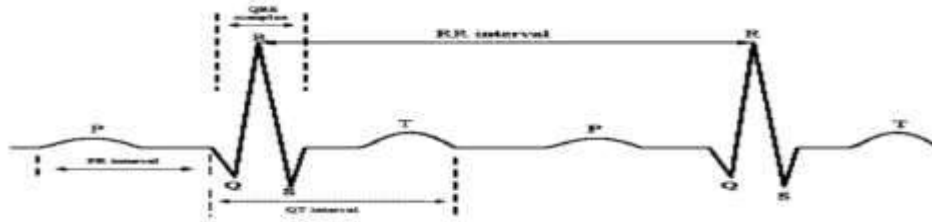


Fig.6.Key ECG parameter values at normal levels

TABLE-II-ECG WAVE INDICATION

Features	Characteristics
PR Interval	0.12-0.20 sec
QRS Interval	0.06-0.10 sec
QT Interval	Less than half of the R-R interval
ST Segment	0.08 sec

When both of the criteria are false, abnormalities are discovered. Lastly, in the case that any illnesses are discovered, an emergency email has been forwarded to the physicians or users, enabling them to take immediate action to save the patients from suffering grave consequences. This can lower the death rate as well as any harm that heart failure may produce.

CONCLUSION

The Internet of Things' integration with healthcare has created a huge new development field. In addition to making healthcare easier, data processing and worldwide trend analysis can help discover novel ways to avoid illnesses. Furthermore, a bright future is fully dependent on the automation of medical facilities and therapeutic methods that use IoT and artificial intelligence to assist doctors better comprehend illness.

But since this subject deals with human health, safety, and security, we need proceed cautiously and not rush into it. This has to be the primary priority. Largely speaking, this may also result in less expensive patient care and therapies. If technology and health work together, we can accomplish the objective.

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E-WASTE MANAGEMENT WITH IOT DIVICES

Mari Kannan M, Arun Kumar R

St.Mother Theresa Engineering College, Vagaikulam

ABSTRACT

The use of electronic products has increased dramatically as a result of the rapid advancements in information and communication technology, particularly with regard to computers and mobile devices, which are becoming increasingly common in our homes and workplaces. Users are discarding outdated products due to the continuous upgrading of electronic gadgets, resulting in a significant amount of electronic trash. Although electronic trash is regarded as one of the major sources of reconditioned raw materials, improper disposal of it can pose a risk to both human health and the environment. It's critical to start in order to understand the regrettable dominance of electronic waste in the environment and society. appropriate comprehensive plan for managing electronic trash. Identifying, tracking, and handling electronic waste is one of the biggest issues the world is currently facing. This paper discusses an automated method that could enable the person to dispose of electronic garbage and receive payment for it. Utilizing With the help of the internet of things (IoT) and cloud computing as a backup, we are able to manage, identify, and keep an eye on the generated electronic trash. Smart city management of electronic trash is aided by it. Establishing appropriate regulations for the disposal of electronic waste, setting up suitable recycling facilities, and strictly enforcing existing laws regarding it can all contribute to slowing down the rate at which electronic waste is growing and, ultimately, to managing it sustainably and with minimal impact

1. INTRODUCTION

1.1 Electronic waste

Given that high-performance electronic devices were only produced towards the latter of the 20th century, the electronic waste is a modern unit. The phrase "electronic" Although there is no precise definition for waste, electronic waste can be defined as any electrical and electronic equipment (EEE) and its component parts that are discarded by people as waste that cannot be repaired. Different sorts of electronic trash might be classified based on different locations. It is sometimes referred to electronic scrap, WEEE, or waste electrical and electronic equipment. It includes a wide variety of equipment, including electrical parts, home appliances with electronic chips, and office equipment.

1.2 Internet of Things (IoT)

The Internet of Things (IoT) is a contemporary idea and technology that makes use of electronic devices connected to one another via wired or wireless networks. network without the user interacting with the electronic gadget within a town or specified area. The three primary groups of linked devices inside the Internet of Things (IoT) are consumer, enterprise, and industrial. Smart devices, wearable technology, and smart TVs are all connected consumer electronics. Under industrial and enterprise devices are things like smart traffic signal systems and smart city cameras, which are used to monitor traffic and weather conditions. To give the user accessing the electronic device in the area advanced services, the electronic device in this field exchanges data and communicates with other machines. The Internet of Things (IoT) allows electronic devices to communicate with administrators or servers about the status of waste bins in a city or neighborhood at all times. This saves time

and provides a convenient method for vehicles to remove electronic garbage from the area.

1.2 Mobile app

The location of the waste, user information, waste information, and organizational or municipal information are all required in order to collect and recycle the e-waste from the city. Consequently, in order to successfully extract and recycle e-waste, a website or mobile application is required to carry out this procedure. Android Studio was used to construct the Android application used in this investigation. The official Android IDE is called Android Studio. Its goal is to develop Android applications for each and every an Android gadget. It contains an intelligent code editor that makes writing code easier and faster. This helps with code completion and code analysis by offering a selectable list. The built-in emulator in Android Studio enables developers to test apps across various Android versions and devices, including phones, Android TVs, and watches. It also speeds up program execution in real time. Additionally, it is compatible with Google Firebase, which aids in many other features such analytics, authentication, and notifications.

Additionally, it contains a layout editor that facilitates the drag and drop of graphic elements used in XML layout files. Additionally, it contains an APK Analyzer that allows you to view the contents of the APK, each size of the total APK size is seen.

2. METHODOLOGY

Pay as you toss is the mechanism used in this study, in which users connect to a mobile app to find the closest trash can or garbage truck to dispose of the trash made of electronics. Figure



1 depicts the system's implementation. The garbage truck collector and the user, who may be the depositor or the collector, make up this system. The e-waste truck collector serves as a

conduit between the city's installed garbage bins and its customers.

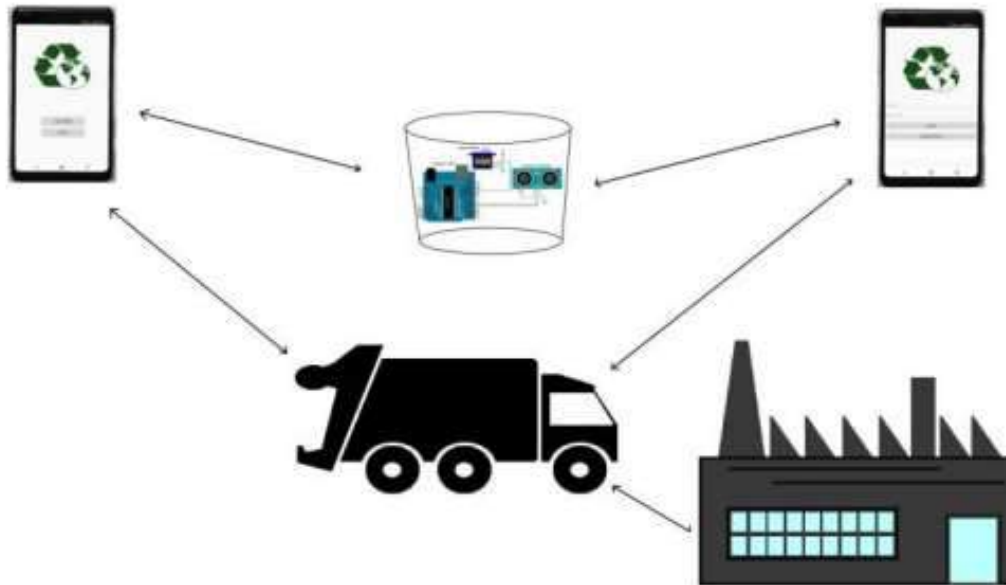


Figure 1: IoT-based e-Waste Management in Operation

Figure 1 illustrates the operation and interconnectivity of this system. This system consists of three fundamental components: the Internet of Things, the front end, and the back end side. Here, the terms "IoT" refer to the users, the e-waste collector, and the actual e-waste container, where the required sensors and equipment are included in the waste bin. This gadget assists in locating electronic garbage and notifying administrators and users of its presence. The people using mobile applications that are installed on their smartphones are referred to as the frontend side. Here, "backend" refers to the Android files kept on Google Firebase servers that contain logic and arithmetic commands necessary to carry out certain tasks and functions, as well as the results of the built functions.

2.1 Frontend (Android application)

Figure 2 illustrates how Android Studio was used to construct the Android application utilized in this study. This frontend uses three different kinds of Android applications. structure. Users need to

have access to the mobile app, which contains the e-waste container and e-waste collector vehicle in order to deposit e-waste. Users can be either the depositor or the collector. To determine if the user is an e-waste truck or a user, a straightforward front-end user experience is designed. A number of options are available, each with a straightforward representation, contingent upon the user's method of application login. One of the functions offered to the user is the option to deposit or collect their e-waste.

The details of the electrical equipment kept within the closest electronic waste can, together with its location. Additionally, it shows where the e-waste collection vans are located within cities or in a particular place. Apart from the aforementioned features, each waste bin placed throughout the city is fitted with an Arduino microcontroller, which is employed to monitor the waste bin's condition and transmit an alert to the server when the container is full, storing and gathering the relevant data.

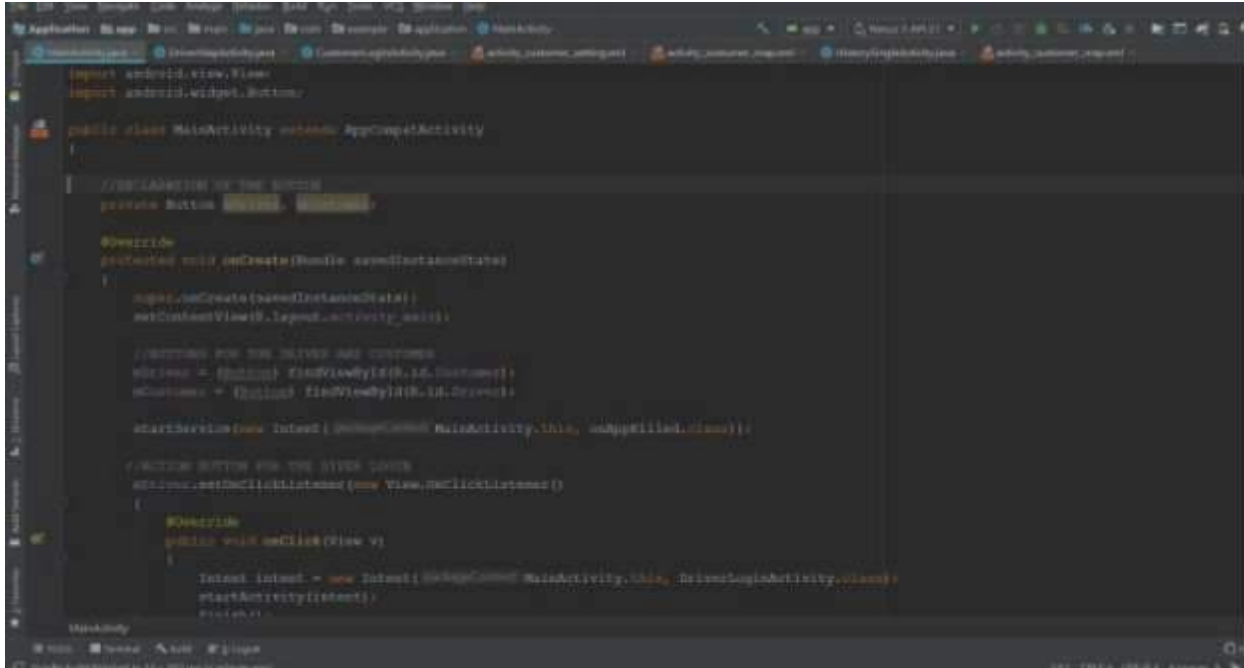


FIGURE2. A snapshot of android studio

2.2 Backend (server)

A computer that has been configured to send data to another computer via a local area network or the internet could be referred to as a server. The backend utilized in this system is firebase, a platform created in 2011 by a stand-alone business to facilitate the building of online and mobile applications. Google purchased the platform in 2014, and it is currently their top offering for app development services. It keeps the Android files and databases that are needed to retrieve data from them. The frontend which can either be the user or the e-waste truck driver makes a request to the backend server, and the server reacts to the request with appropriate criticism. Features offered by Firebase include email and password authentication, real-time data, integrated security, storing static files, and a file storage system with Google Cloud Storage backups.

2.3 E-waste bin (IoT)

The e-waste bin consists of hardware like ultrasonic sensor, android gadget, servo motor and microcontroller (Arduino). The ultrasonic sensor's purpose is to check if the trash can is filled to the brim. The way these devices operate is by sending a series of signal waves to the adjacent sides of the e-waste bin, which are then analyzed by the microcontroller, which determines whether or not the e-waste bin is filled. When the e-waste bin is filled, it sends data to the server, which then uses that information to create a mobile app that contains information about the electrical equipment and can be used for recycling or refurbishing. The e-

waste bin's servo motor is responsible for opening and closing the bin; only users or the drivers of e-waste trucks who receive authentication from the server are permitted access.

2.4 E-waste collector

The e-waste collection serves as a conduit for users. It receives requests regarding the depositors and collectors in the city or region from users and the server. It also obtains authentication from the server to validate the e-waste and authorized user. Additionally, it is used to transmit information about the e-waste to the server in order to verify the product's endurance and quality.

3. IMPLEMENTATION

In this study report, we offer a solution that is backed up by an implementation. This framework offers a solution to problems with managing e-waste at home and workplace by providing the nominee with a financial prize at work. In order to Users, or the collector, must follow the instructions provided by the server in order to obtain the e-waste from the e-waste bins and make payment for the item.

We can finish this concept by utilizing technologies like Firebase for the backend, Android for mobile applications, and the Internet of Things. A straightforward figure 3 depicts the implementation of this idea.

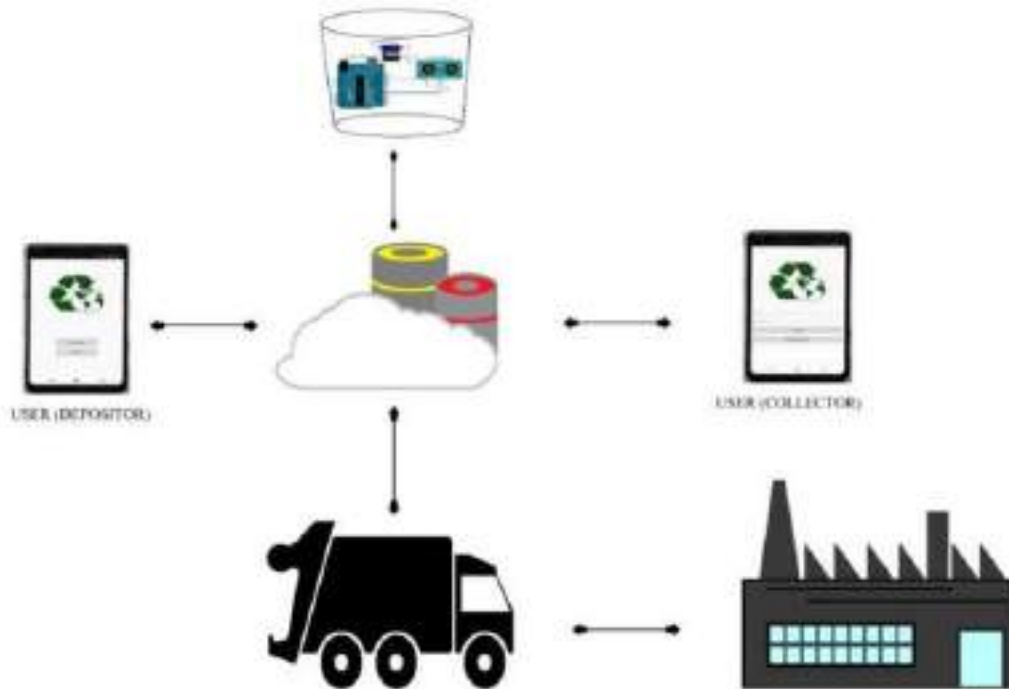


FIGURE3. Implementation of e-waste

1)Android Application (User)

Figure 4 displays a screen grab of the Android app that was utilized for this investigation. Users can access their application by logging in and selecting whether to buy or discard their previous offerings. Next, the program gives users options such as the position of the closest recycling truck, the location of the e-waste bin in real-time, and the current state of the e-waste that has

been dumped within the recycling bin. An OTP is sent to the designated users from the server for authentication in order to open and close the e-waste bin. Additionally, users can verify the specifics of the electronic waste within the electronic waste container, as well as the depositor's details and check-in and check-out times.



FIGURE4. SANPSHOT OF THE APPLICATION

2. E-waste bin

As was previously noted, an e-waste bin is a component of the Internet of Things and is made up of hardware devices as well as an Android software that allows depositors to authenticate

themselves. gatherer. In addition, it notifies the server as to whether the e-waste bin is full or empty in order to create an Android post.

3. Android application (E-waste driver)



E-waste truck driver can log in using their required information and password. It gets request from the users and server about the depositors and collectors in the city or area. It also gets authentication from the server for confirming the authorized user

and e-waste. It also use to send details about the e-waste to the server for confirming the durability and quality of the e-waste product to the server.

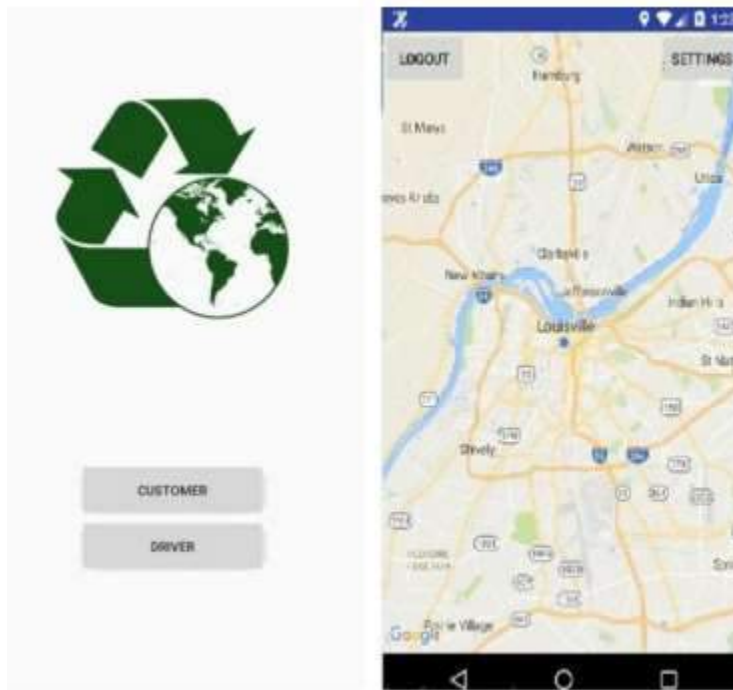


Fig.5-Output

4. CONCLUSION AND FUTURE ENHACEMENTS

As previously said, we put up a solution that is backed by an execution. This framework offers a solution to problems with managing e-waste at home and workplace by providing the nominee with a monetary prize. In order to obtain the e-waste from the e-waste bins and pay for the product, the users, or the collector, must follow the instructions provided by the server. Through the use of technologies such as the Internet of Things, Android mobile applications, and Firebase backend, we may finish this design.

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MICRO CONTROLLER BASED VOLTAGE PROTECTION SYSTEM

Vidyashree, Varshny, II ECE

St.Mother Theresa Engineering College, Vagaikulam, Thoothukudi-628102

ABSTRACT

This paper presents strategies for assessment and independent control of voltage which is finished by an automated microcontroller based security framework with thermistor. It used to really look at temperature alongside voltage insurance. The transformer utilized is copper cored and it works just on rotating current source. The thermistor is utilized to distinguish the temperature in instance of overheating or fire problems. GPS module is additionally used to mindful proprietor of the framework by sending the instant message on telephone in the event of recognition of any surprising action. Like low voltage, high voltage, high temperature. The principal challenge is to make a succession of codes for legitimate working.

KEYWORDS: Microcontroller, Thermistor, Low Voltage, High Voltage, Arduino

I. INTRODUCTION

The abnormality in voltage is the significant issue confronting industry also, home today and in many cases, is liable for harming important electrical gear. Electrical Power Framework assurance gadget is expected for security of both client and the framework hardware from shortcoming; thus electrical machines are not permitted to work with no defensive gadget introduced. Power Framework shortcoming is characterized as unfortunate condition that happens in the power framework and the unwanted circumstances are short out, current spillage, ground short, over current, under and over voltage.

In technical terms, an over/under voltage condition occurs when the voltage is 10% higher or lower than the nominal voltage for a duration of more than one minute. Short-duration voltage events, including both impulsive and oscillatory transients, may also transpire. Short-term intermittent supply failures can occur for a variety of reasons, including problems with the supply system, equipment malfunctions, or problems with control equipment. They can last anywhere from 0.5 cycles to 1 minute.

While overvoltage in the form of spikes and surges can result in distortion, burn-out, meltdown, fire, and irreparable damages, undervoltage can produce brownout, distortion, or permanent damage.

II. HIGH AND LOW VOLTAGE PROTECTION

Only 220 volts is sufficient for the operation of most household appliances. A 20% increase or decrease in the required voltage is likely to cause damage to the equipment.

Relays were the sole component of the early device protection techniques. They are not given access to the most recent features that are available on the market right now. In older

systems, there were simply fuses, which burned at greater voltages and had to be replaced later by the user alone. Usually, the early low voltage protection circuit is unable to sense temperature and cannot alert the user to a problem.

The most recent protection system, which includes every safety feature possible, including: detecting high and low voltage without jeopardizing the fuse circuit; supplying voltage to the device only after obtaining a stable supply because it can also detect fluctuations; — temperature detection using a thermistor. And all of this was completed simultaneously with immediate notification of the device's owner via text message on a GSM module-

III. COMPONENTS USED

- Microcontroller
- Transformer
- Relay
- Voltage Regulator
- Voltmeter
- Arduino
- GSM Module
- Thermistor

IV. WORKING METHODOLOGY

First, we supply the system with electricity, connecting the voltage regulator and voltmeter in parallel. Here, the circuit's voltage is controlled by the voltage regulator, allowing us to verify whether the project can actually shield any system from a high- or low-voltage source.

Since all of the processes are in DC, a step down transformer is used after the voltage regulator to ensure that the subsequent circuits operate as intended. However, we add a full wave



bridge rectifier because the next circuit cannot be made to function simply by stepping down an AC supply. Its primary purpose is to change an AC signal into a DC signal, albeit the signal will still naturally contain ripples. Therefore, in order to minimize or neutralize it, we employ a capacitor to produce a direct signal that has the least amount of ripple.

Following the full wave bridge rectifier, all three circuit boards—which are primarily used for temperature sensor control, high voltage trip circuits, and low voltage trip circuits—are connected in parallel and subsequently to their relays, which control and safeguard the main system that is connected to this protection system.

Additionally, we connected an Arduino to a GSM module so that in the event that the system overheats, the Arduino programming can send an SMS to the cell phone provided.

V. BLOCK DIAGRAM

It is shown in fig.1

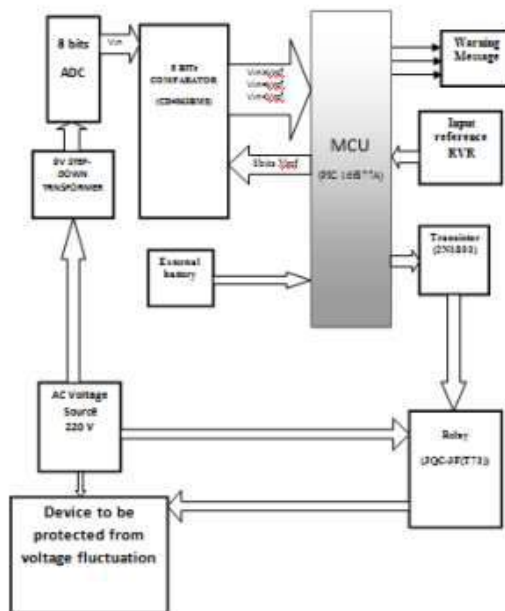


Fig.1.Block Diagram

V.RESULT

The outcome of the work that our teachers and I put into this project over the period of several months. The protection system is properly tested on various devices, taking into account the stated parameters. Various voltages were applied in order to assess its efficiency. The relays stay closed and the attached gadget functions when the supplied voltage is within the designated range. A voltmeter measures and shows the supplied voltage. Relays get activated in the event of an undesired scenario, tripping the device's supply. The outcome of the work our professors and I put into this project over the period of several months.

When the power is turned off because of overheating, low voltage, or high voltage, a notification is sent. Your system's power supply will cut off for safety reasons and re-connect when the weather stabilizes and becomes usable.



Fig.2.Hardware Photo

VI.CONCLUSION

The primary voltage supply is monitored by a microcontroller-circuit, which is intended to cut it off if it drops or rises outside of the specified voltage range (RVR). In the event that the voltage is disconnected, the microcontroller circuit will continue to monitor it and will only reconnect it when it stabilizes and complies with the RVR. The project's design worked well. The design is appropriate for both residential and commercial use, considering the global variations in main voltage supply, particularly in the summer and during extreme weather conditions and subsequent power outages. Equipment linked to the main supply that is electrical and electronic can become damaged as a result of voltage fluctuations. This project uses a 215–230 volt RVR range as the typical voltage boundary; the design suggests using a keypad to input the RVR manually. The benefit of Keypad is that it allows you to select any voltage range (110 V supply, for example). More and more value gadgets will be provided by the embedded system approach, which is based on microcontrollers and is an intelligent system that may be used for voltage monitoring to protect office or home electric equipment.



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UDC 631.4

MORPHOGENETIC, AGROPHYSICAL, MECHANICAL COMPOSITION AND PROPERTIES OF SOILS OF THE DRIED BOTTOM OF THE ARAL SEA

Oteuliyev Jaksilik Begdullayevich¹, Dozhanov Kilishbay Jienbayevich²,
Alpisbaeva Akmaral Jubatkhanovna³

¹Doctor of Philosophy in Agricultural Sciences (PhD), Associate Professor

²Trainee Teacher

³Assistant

Karakalpak State University named after. Berdaha
The Republic of Uzbekistan

ANNOTATION

The article presents the climatic conditions of the soil, groundwater level and other factors influencing the morphological characteristics, mechanical composition and agrophysical properties of the soils of the dried bottom of the Aral Sea.

KEY WORDS: Sand, loam, humus, fraction, soil, horizon, grunt

The agrophysical properties of experimental soils have a long history of analysis of the fertility elements affecting it and their origin. The morphogenetic characteristics of the dry bottom soils of the Aral Sea were mainly formed during the soil formation process.

As a result of studying the morphological characteristics of the soils of the dried bottom of the Aral Sea, we determined the origin of these soils, first of all, their connection with the regime of lake sediments, as well as the terrain, as well as with the nature of the soil-forming rocks, vegetation cover, climatic conditions, depth and mineralization of filtration waters .

Groundwater is characterized by relatively high mineralization. Also, this situation creates favorable conditions for the development of salinity in the soil.

In order to determine the characteristics of soil formation in the region and to create a possibility to include the soils in a certain type or group, we studied the morphological characteristics of the dried bottom soils of the Aral Sea.

When analyzing the morphological structure of the studied soils, it was established that one of the morphological features of the soil profile in the morphological section of soils distributed in the study area is a sandy (Ar) 0-30 cm light sandy layer. This layer is gray light-dark, light brown, dry or in small quantities, low quality, no plant remains were found.

The accumulative-humus horizon sometimes corresponds to the thickness of the agro-irrigation horizon; in most cases, its formation is observed to the lower layers up to 30 cm deep. These horizons contain alluvial deposits, which are less involved in soil formation processes. In terms of their

mechanical composition, they consist of sharp layers. This part of the section shows signs of modern gluing, mainly in the form of rust and dark spots.

Now we can consider the morphological classification of the obtained sections. Section 1 (point 0) 43°52'20.4"N 59°01'13.3"E-contour in the soil of the "Drained bottom of the Aral Sea" in a layer of 0-9 cm of light gray color, salt compounds and silicon oxide are present, according to mechanical the composition is sandy, the structure is powdery, the arrangement is dense, there are dark spots, the transition to the next layer is gradual.

9-19 cm. The color is brown, the humidity is low, salt compounds are found, the mechanical composition is medium sandy, the structure is coin-shaped, the location is highly compacted, there are rust spots, there are a lot of shell residues in the seams, the transition to the next layer is abrupt.

19-27 cm. The color is brown, the humidity is moderately humid, the mechanical composition is medium sand, the structure is loose, the arrangement is less compacted, there are rust spots, the transition to the next layer is slow.

27-46 cm. The color is light gray, the humidity is average, the granulometric composition is heavy sandy, the structure is powdery, the arrangement is less dense, there are rust spots, there are small remains of shells, the transition to the next layer is slow.

46-60 cm. The color is light bluish-gray, the moisture is medium-humid, the mechanical composition is sandy, the structure is dusty, the arrangement is medium-dense, the new crack is powdery gypsum, there is a small amount of shell deposits, the transition to the next layer is slow.



60-78 cm. Color brown, iron residues, medium-humidity, heavy sandy in mechanical composition, thin in structure, like a coin, medium-dense arrangement, no traces of insects, inclusions in the shell often leave faded residues, the transition to the next layer is slow.

78-128 cm. The color is bluish-gray, consists of yellow ribbon-like lines, the humidity is moderately humid, the mechanical composition is medium sandy, the structure is fine-powdery, there are rust spots, the migration is dense, there are many gypsum crystals in new cracks, the transition to the next layer is sharp.

The solid part of the soil consists of mechanical particles of different sizes. These are rocks, mineral fragments, as well as various mineral, organic and organomineral compounds formed during the process of soil formation.

Different fractions of mechanical particles in the soil each have their own characteristics, which describe the most important (porosity, heat capacity, structural properties of the soil, water-physical properties, biological activity, absorption capacity, chemical composition, agrochemical properties and fertility) properties of the soil.

1 – Table
Mechanical composition of soils of the Aral Sea

Soil section	Soil cover sm	Soil particles, mm							Names according to mechanical composition
		0,25-0,10	0,10-0,05	0,05-0,01	0,01-0,005	0,005-0,001	<0,001	<0,01	
1	0-13	1,8	11,2	61,7	3,0	7,8	14,5	25,3	Legkiy peschanny
	13-21	1,1	8,4	52,6	8,3	9,5	20,1	37,9	Medium sandy
	21-31	0,9	12,5	67,9	2,6	6,1	10,0	18,7	Sandy
	31-36	1,1	12,0	50,4	8,8	12,1	15,6	36,5	Medium sandy
	36-44	1,4	8,4	52,6	8,3	9,5	20,1	38,3	Medium sandy
	44-53	0,9	9,7	69,9	4,6	5,3	9,6	19,5	Sandy
	53-58	1,8	11,2	61,7	3,0	7,8	14,5	25,3	Legkiy peschanny
	58-71	0,9	12,5	58,6	7,3	9,7	11,0	28,0	Legkiy peschanny
2	71-86	0,9	12,5	58,6	7,3	9,7	11,0	28,0	Legkiy peschanny
	0-9	2,4	3,1	28,8	11,5	4,3	5,0	23,1	Legkiy peschanny
	9-19	0,6	0,4	18,2	7,4	14,1	4,5	27,2	Legkiy peschanny
	19-27	2,8	0,8	20,2	18,1	7,2	10,2	34,5	Medium sandy
	27-46	0,6	0,6	30,2	12,2	11,4	9,9	35,1	Medium sandy
	46-60	1,5	0,3	35,4	10,7	3,6	1,4	15,3	Sandy
	60-78	3,8	1,0	40,3	3,9	4,1	3,0	11,2	Sandy
78-128	1,3	2,0	32,5	11,0	8,0	8,9	25,1	Legkiy peschanny	

In terms of mechanical composition, there is a predominance of sands of medium and light composition; in some layers there are also heavy sands and a sandy composition.

Bulk density, specific gravity and porosity of soil are one of the most important physical properties of soil. The specific gravity, bulk density and porosity of this soil are unique compared to other soils. According to the mechanical composition of the land, the volume weight has increased and the soil is compacted.

When sampling from the dried bottom of the Aral Sea in autumn and spring, the lowest moisture content ranged from 7.9% to 11.1% in the 0-10 cm layer, and the average moisture content in the 0-30 cm layer was 11.0%. up to 12.2%, in layers 0-100 cm, soil moisture 15.49-15.5%, humidity decreases as temperatures rise in the spring months. It has been established that the highest percentage of moisture in the soil is observed in layers of 90-100 cm and increases to 22.2% in the autumn months and 22.8% in the spring months.

We can observe that the volumetric weight of the sampled soils varied from 1.41 g/cm³ to 1.43 g/cm³ in the 0-10 cm layer and from 1.76 g/cm³ to 1.77 g/cm³ in the 70-80 layer cm. It has been established that the volumetric weight of soil in layers of 0-50 cm in the autumn months is 1.44 g/cm³, in the spring - 1.46 g/cm³, in layers - from 1.57 g/cm³ to 1.58 g/cm³. 0-100 cm. During the survey, it was found that the specific gravity of soil samples taken from experimental plots in the autumn and spring months was in the range of 2.60-2.80 g/cm³.

If the total porosity of soils used for agricultural work is less than 50%, such soils are considered low-density. It turned out that in the autumn months of our soil research, 45.8% was in a layer of 0-10 cm, 39.2% in a layer of 10-20 cm, but reached 53.3% due to the remains of shells in a layer of 20-30 cm The average soil porosity was 46.0% in layers 0-30 cm, 45.8% in layers 0-50 cm, 41.6% in layers 0-100 cm.

As a result of studies carried out at the second experimental site, we see that soil porosity increased to 46.0% in the 0-10



cm layer, 44.7% in the 0-50 cm layer and 41.1% in the 0-50 cm layer layer 0-100 cm. As soil density increases, air exchange processes decrease, which negatively affects the growth and development of plants.

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PAGGALUGAD SA MGA ESTRATEHIYA NG MGA GURO SA FILIPINO SA PAGSULAT NG SARILING KATHANG STORYBOOK: ISANG KWALITATIBONG PAG-AARAL

Heide Mae S. Tero, LPT¹, Susan B. Dipolog, PhD²

¹ORCID No. 0009-0002-2143-4505

Teacher I, Mati National Comprehensive High School, Sainz, Mati City, Davao Oriental, Philippines

²ORCID No. 0009-0008-9069-5956

Instructor, University of Mindanao, Tagum City, Davao del Norte Philippines

Article DOI: <https://doi.org/10.36713/epra16266>

DOI No: 10.36713/epra16266

ABSTRAK

Ang layunin ng kwalitatibong pananaliksik na ito ay galugarin ang mga estratehiya ng mga guro sa Filipino sa pagsulat ng sariling kathang storybook sa Sangay ng Mati, Davao Oriental. Ito ay partikular na tutuklas sa mga estratehiya ng mga guro sa Filipino sa pagsulat ng sarili kathang storybook, mga hamon na kinakaharap dahil sila ay nagtuturo sa elementarya ngunit nakapagtapos ng pangsekundarya, at kanilang mithiin at adhikain. Saklaw ng pananaliksik na ito ang karanasan ng labing-apat (14) na mga guro sa Filipino ng Sangay ng Mati, Davao Oriental at nakatuon ang pananaliksik sa kanilang karanasan sa paglapat ng estratehiya sa pagsulat ng sariling kathang storybook. Ang mga nasuring pahayag na mula sa tugon ng mga partisipante tungkol sa estratehiya ng mga guro sa Filipino na nilapat upang mabuo ng sariling kathang storybook ay ang sumusunod na tema: pagpukaw ng interes; paglapat ng gintong aral; pag-ugnay sa karanasan ng mag-aaral; pag-akma sa kakayahan ng mambabasa; at pagpapaunlad sa kasanayan. Kaugnay naman sa mga hamon sa pagsulat ng mga guro sa Filipino na nagtuturo sa elementarya ngunit nakapagtapos ng pangsekundarya ay lumitaw ang sumusunod na tema: kakulangan ng karanasan ng mga guro; kahirapan sa paggamit ng angkop na salita; kawalan ng pagsasanay sa pagsulat; at kakulangan ng primaryang sanggunian. Tungkol naman sa mithiin at adhikain ng mga guro sa Filipino, lumutang ang sumusunod na tema: mahimok ang mga gurong gamitin ang kagamitang pagtuturo; mapaunlad ang pagbasa at pagkatuto ng mag-aaral; mapayabong ang pagtaguyod ng kultura at wikang Filipino; mahikayat ang mga guro na maging manunulat; at mailapat ang nakapaloob na gintong aral sa nabasang storybook. Mahalaga ang pag-aaral na ito sapagkat naglalayong bigyang-diin na himukin ang mga gurong manunulat sa Filipino gamit ang mga estratehiyang lumitaw upang marami pang kagamitang pampagkatuto ang mabubuo. Sa pamamagitan nito, maaaring maraming mga mag-aaral ang matutulungan at mapaunlad ang kanilang kasanayan sa pagbasa.

MGA SUSING SALITA: guro sa Filipino, storybook, estratehiya, sariling katha, mga mag-aaral, Mati, Davao Oriental

INTRODUKSYON

Ang pagbubuo at paglikha ng sariling kathang *storybook* ay isang malaking pangangailangan sa pagtugon sa kahinaan ng mga mag-aaral sa kasanayan sa pagbasa. Bagaman maraming mga estratehiyang inilalapat ang mga guro, ang mga estratehiyang akma sa konteksto at interes ng mga mag-aaral ang siyang tanging makalulun sa naturang kahinaan. Subalit, ang paglikha ng sariling kathang *storybook* ay siyang malaking hamon sa mga gurong naghahandanito lalo pa at napakaraming panuntunang dapat isaalang-alang.

Isa sa mga bansang nakararanas ng kakulangan sa pagpapalawig ng teksto o akda sa pagkahihinuha ng mga mag-aaral ay ang bansang Taiwan kung kaya't ang mga guro ayon sa pananaliksik ay gumamit ng samot-saring estratehiya na naging epektibo at episyente para sa kanila. Ang estratehiyang ginagamit sa Taiwan ay sa tulong ng paggamit ng mga larawan bilang kagamitang biswal sa paglikha ng *storybook*. Ang pananaw na ito ay

natutugunan ang kahirapan ng mga mag-aaral sa kanilang pagkatuto at kasanayang pagbabasa. Napag - alaman na nakakukuha ng mataas na marka kung nilalapatan ang teksto ng mga larawan (Pan, Y., at Yi-Ching, P., 2017). Dagdag pa rito, sa bansang China naman naging hamon din ang kasanayan sa pagbasa. Batay sa pananaliksik (Asif & Gouqing, 2023) na naglalayong siyasatin ang pag-uugali sa pagbabasa ng mga mag-aaral sa tulong ng mga *storybook* na may iba't ibang wika. Pagsasama-sama ng wika at kulturangsiyang mahahalagang elemento sa isang mahalagang aspekto ng pagkamit ng isang comprehensibo at mahusay na pagbabasa.

Sa bansang Indonesia, napag-alaman na mahina ang antas sa kasanayan sa pagbabasa ang mga mag-aaral. Nailarawan ang pagtuturo ng mga akda ay nakababagot at bumababa ang atensyon ng mga mag-aaral. Kung kaya, gamit ang *storybook* para sa Elementarya ay napagpasyahan na ito ay magpapasigla at nakapupukaw sa interes para sa kanilang pagkatuto at nilalapatan



ng mga estratehiyang akma sa kani-kanilang (Ratminingsih, et.al, 2020). Gayundin sa bansang China naman upang matugunan ang problema sa kasanayan sa pagbasa ang pagsasanay sa pagbabasa ng mga mag-aal ay ginagamitan ng *storybook* lalo pa at bata pa sila. Sa pag-aaral ni Maximo (2019) nagpahayag na “nasisiyahan sa pagbabasa kapag sila ay may interes sa aklat”. Iminumungkahi rin ng pag-aaral Maximo na ang pag-alam at paggamit ng mga espesyal na estratehiya sa pagbabasa ng mga *storybook* ay mabisa dahil tinutulungang mapanatili ang kanilang interes sa kuwento at tulay rin ito upang mapaabot sa mga mag-aaral ang pagiging epektibo sa pagbabasa.

Sa Pilipinas partikular na sa Leyte, maraming mga mag-aaral ang may kahinaa sa kasanayan sa pagbasa. Kaya, napagtanto ito ng mga gurong nagtuturo sa sariling wika na sa paggamit ng mga *storybook* ay nagiging epektibo ang pagtuturo kung natutugunan ang kanilang pangangailangan (Sua, 2021). Sa kanyang pag-aaral, inilahad na mas napabuti ang kasanayan sa pagbasa ng mag-aaral matapos gamitin ang *storybook*. Kasama ang mga mungkahing: paggamit pa ng *storybook* sa loob ng silid-aralan; paghimok sa mga guro na gumamit ng iba’t ibang kagamitan sa pagtuturo; at pagsasanay sa mga guro sa paglikha ng mga *storybook*.

Sa Calamba, Laguna ay naging hamon din ang kasanayan sa pagbabasa. Ilang sa mga mag-aaral ay hindi marunong bumasa mas lalo na ang hindi maunawaan ang binasang teksto dahil tulay ang kasanayan sa pagbabasa tungo sa pag-unawa. Maaaring marunong magbasa ang isang tao ng ilang salita, ngunit ang pag-unawa ay isang bagay na binuo, ginagawa, natutuhan, at nararanasan sa paglipas ng panahon (Cariag at Quimbo, 2022).

Samantala, sa Lungsod ng Mati, Probinsya ng Davao Oriental naman ay isa sa mga problema ng mga guro ay mababa ang kasanayan ng mga mag-aaral sa pagbasa kung kaya may mga guro sa Filipino na nagtuturo sa Elementarya ay bumuo at lumikha ng isang sariling kathang *storybook* alinsunod sa *DepEd Order Memorandum No. 078*, s. 2022 na “Pansangay na Paligsahan sa Pagsulat ng Kuwentong Pambata- Dibisyon na Lebel”. Ayon dito, ang nakaeengganyong pagbabasa ng *storybook* para sa mga bata ay may mahalagang papel sa pagsasara ng mga puwang sa pagbasa. Ang mga guro sa Filipino ay isinaalang-alang ang pangangailangan ng mga mag-aaral upang makabuo ng sariling kathang *storybook* at sila’y gumamit ng mga estratehiyang tutugon dito. Higit na epektibo ang mga likhang ito ng mga guro dahil kontekstuwalisado ang pangyayari, lugar at kagamitan sa pagbuo ng *storybook* na siyang nagreresulta na madaling matuto sa pagbasa at mauunawan ang kanilang binabasa dahil sa taglay nitong larawan at iba pang istilo. Kaya naman, bilang mananaliksik, ang dalumatang estratehiya ng mga gurong ito sa paglika ng *storybook* ay mas makatutulong upang lalo pang mabatid ang kasanayan, kabuluhan, at karanasan ng mga ito lalo na sa paglalapat nito bilang kagamitang pampagtuturo sa Elementarya.

May mga naisawagang pag-aaral hinggil sa paggawa ng isang maikling kuwento, isa na rito ang pananaliksik ni Musaljon

(2019) na ang paggawa ng isang maikling kuwento ayon sa Modelong *Mind Mapping* ay sumulat muna ng isang *keyword* mula sa napiling tema sa gitna ng papel. Ang tema noon ay inilarawan sa mga sangay sa anyo ng mga elemento ng maikling kuwento na kinabibilangan ng daloy, karakterisasyon, tauhan, tagpuan, ang punto de bista, at wakasan ang napiling kuwento. Dagdag pa rito, may mga karagdagan na paraan sa pagbuo ng isang *storybook* na kinabibilangan ng ilang proseso sa pagkolekta at pagbibigay ng materyal, pagsulat ng iskrip, at pagdidisenyo ng mga larawan. Ginamit nina Astuti at Iskarna (2022) ang modelong ADDIE sa pagbuo ng kanilang *digital storybook* para sa bata. Gayunpaman, wala pang nailimbag na pag-aaral na sumasalamin sa mga estratehiya ng mga guro sa paglikha ng *storybook* sa Dibisyon ng Lungsod ng Mati. Gayundin, sa kasalukuyan ay limitado ang mga kaugnay na literatura sa mga karanasan at kasanayan sa paggawa ng sariling *storybook* sa lokal na konteksto at hindi nabigyang-tuon ang karanasan, mga kinakaharap na hamon at mithiin ng mga guro.

Mahalagang maisagawa ang pag-aaral na ito upang makapagbigay ng agarang impormasyon sa iba pang guro sa Filipino sa mga estratehiya maaaring gagamitin upang makabuo ng isang *storybook* na siyang magagamit ng mga mag-aaral na lokal. Gayundin ay makatutulong ang pagnanaliksik na ito sa mga guro sa Filipino na magkaroon ng kagamitang pampagkatuto upang matugunan ang problema ng mga mag-aaral sa kasanayan sa pagbasa. Sa pamamagitan ng pag-aaral na ito mabatid ng kinaaukulan lalo na sa ahensya ng Kagawaran ng Edukasyonat makapagbigay aksyon na magsasagawa ng mga pagsasanay at palihan hinggil sa kasanayan sa pagbuo ng sariling kathang *storybook*.

Layunin ng Pananaliksik

Sa pananaliksik na ito ay ginalugad ang mga estratehiyang ginamit at nilapat ng mga guro sa Filipino sa pagbuo ng sariling kathang *storybook*, na siyang nagsilbing lunsaran o kagamitang pampagtuturo tungo sa pagkatuto ng mga mag-aaral. Ang mga partisipante ng pag-aaral na ito ay ang mga guro sa Filipino na sumali sa ginawang patimpalak sa pagbuo ng *storybook* sa Dibisyon ng Lungsod ng Mati.

Ang pokus ng pag-aaral na ito ay ang paglalugad sa mga estratehiya ng mga guro sa Filipino ay nabatid nang husto ang mga tiyak na estratehiya o pamamaraan na inilapat at pinagbatayan ng mga guro sa pagbuo ng sariling kathang *storybook* maging ang likod ng karanasan sa paghahanda, hamon sa pagbuo, at adhikain para sa ikauunlad ng kasanayang pagbasa.

Mga Katanungan ng Pananaliksik

1. Ano-ano ang mga estratehiya ng mga guro sa Filipino sa pagbuo ng sariling kathang *storybook*?
2. Ano-ano ang mga hamon na nararanasan sa pagbuo ng sariling kathang *storybook* ng mga guro sa Elementarya na nagtuturo ng Filipino na nakapagtapos ng BSED Filipino?



3. Ano-ano ang mga mithiin at adhikain ng mga guro sa Elementarya na nagtuturo ng asignaturang Filipino sa pagbuo ng sariling kathang *storybook*?

METODOLOHIYA

Isang kwalitatibong pananaliksik ang pag-aaral na ito. Ito ay nakatuon sa klase-klaseng metodolohikal na tradisyon sa pagtatanong na nag sasaliksik sa isyung panlipunan o pantao (Creswell, 2013). Dagdag pa rito, Generik na Kwalitatibo ang ginamit na disenyo dahil naka pokus ito sa estratehiyang ginamit ng mga gurosa Filipino sapagbuo ng sariling kathang *storybook*. Sa pananaliksik naito ay mas angkop na gagamiting metodo ay generik nakwalitatibo. Ang generik na kwalitatibong pananaliksik ay isang deskriptibong metodolohiya na naglalayong tuklasin ang pagbibigay kahulugan ng tao ang mga sitwasyon batay sa "kung ano ang pinakamahusay na gagana" sapagtugon sa mga layunin ng pananaliksik. Angkop nagagamitin para sapag-aaral na iton ang makuha at mailahad ng piling kalahok sa pagbibigay datos hinggil sa estratehiya na ginamit ng guro sa pagbuo ng sariling kathang *storybook*.

Sa pananaliksik na ito ang pinagkunan ng datos ay mga guro sa Filipino na nakapagtapos ng BSED Filipino na nagtuturo sa Elementarya. Nagmula ang mga partisipante sa pampublikong paaralan na napabibilang sa Dibisyon ng Mati City, Probinsya ng Davao Oriental. Pinili ng mananaliksik ng labing-apat (14) partisipanteng mga guro sa Elementarya na nagtuturo ng

asignaturang Filipino. Sa napiling kalahok, ang pito (7) ay sa pamamagitan ng pinalalim na panayam at pito (7) ay sa pokus na pangkatang diskusyon.

Higit pa rito, Pinili ang mgakalahok sa paraang purposive sampling technique. Sa mga napiling kalahok sila ay dumaan sa krayterya o pamantayan upang mapabilang sa pagkukunan ng datos sa pag-aaral: (1) kinakailangan ay permanenteng kawani ng gobyerno o opisyal na aytem na sa pampublikong paaralan saklaw ng Dibisyon ng Mati, Probinsya ng Davao Oriental; (2) guro na nakapagtapos ng BSED Filipino nanagtuturo ng asignaturang Filipino sa Elementarya; (3) dapat isa sa mga kalahok ng "Pansangay na Paligsahan sa Pagsulat ng Kuwentong Pambata- Dibisyon na Lebel" at (4) maaaring bago pa o matagal na sa serbisyo ang gurong ito. Hindi saklaw sa pagpili ng mga partisipante sa pananaliksik na ito ang sumusunod: (1) gurosa Filipino na nagtuturo sa Sekundarya at (2) guro sa Elementarya na nagtuturo sa pribadong paaralan.

Maliban dito, ang coding ay gagamitin upangtukuyin, ayusin, at kategoryahin ang mgasagot ng mga kalahok sa panahon ng mga panayam upang makabuo ng kontekstwalisadong mga pangunahing ideya hinggil dito. Sa pag-aaral na ito, gagamitin din ang tematikong pagsusuri pagkatapos i-coding ang mga ideya at konsepto mula sa mgasagot. Sa proseso ng pag-aaral na ito, ipagtatanto rin ang mga etikal na konsiderasyon upang mapangalagaan ang kapakanan ng mgakalahok.

MGA RESULTA

Talahanayan 1

Mga Pangunahing Tema at mga Idea Tungkol sa mga Estratehiya ng mga Guro sa Filipino sa Pagsulat ng Sariling Kathang *Storybook*

Mga Pangunahing Tema	Mga Pangunahing Idea
Pagpukaw ng Interes	<ul style="list-style-type: none"> • Paggawa ng mga kuwento na hindi nakababagot sa mga mag-aaral • Pagsanib ng edukasyon na nakaaaliw • Pag-alam sa interes at karanasan ng mga mag-aaral • Pagkuha ng interes kapag nabasa nila ang kuwento • Pagpapaunlad sa komprehensyon sa pamamagitan ng hatid nitong aliw • Pag-aangkop sa panahon upang makuha ang interes ng mag-aaral • Pang-aangkop sa kultura nang makukuha ang interes ng mga mag-aaral
Paglapat ng Gintong Aral	<ul style="list-style-type: none"> • Paggawa ng kuwento na may aral na nakabatay sa aralin • Pagbabatay sa pangangailangan ng mga mag-aaral lalong-lalo na ang paglalapat sa mga gintong aral • Paglalapat sa pagbibigay-halaga ng papel ng tauhan na mapulot sa <i>storybook</i>



	<ul style="list-style-type: none"> • Pagsulat ng makabuluhang katha at kapupulutan ng aral na angkop sa mag-aaral • Pagpapabuti sa kanilang paglaki at pagkatuto
<p>Pag-uugnay sa Karanasan ng Mag-aaral</p>	<ul style="list-style-type: none"> • Pag-uugnay sa pangyayari sa paligid, at sariling karanasan • Paggawa ng kuwento na batay sa makikita sa komunidad ng Mati at sa kinagisnan na tirahan • Paggamit ng mga pangalan ng bagay at lugar na pamilyar ang mga mag-aaral • Pagbatay sa sariling karanasan, pagiging kontekstuwalisado, at paggamit ng malawak na imahinasyon • Pag-uugnay sa totong buhay o sariling karanasan nang maramdaman ng mga mag-aaral ang bawat sitwasyon • Pagiging sensitibo dahil may iba't ibang kultura, ugali, pangangailangan ang mga mag-aaral • Pag-uugnay sa pang-araw-araw na ginagawa ng mag-aaral sa loob at labas ng paaralan • Pagkakaroon ng malayang kaisipan na maiugnay ng mag-aaral ang kanilang karanasan • Pagsasaalang-alang sa kultura, relihiyon at paniniwala ng mag-aaral • Pagiging inklusibo sa materyal hindi lamang nakatuon sa Kristiyanong maging sa Islam din
<p>Pag-akma sa Kakayahan ng Mambabasa</p>	<ul style="list-style-type: none"> • Pag-aakma sa baitang at mabusisi sa pagpili ng tamang salita • Pagbabatay sa pangangailangan ng mag-aaral sa silid-aralan • Pagsaalang-alang sa paggamit ng salita at sinisigurado ng guro na madaling maunawaan ng mambabasa • Pagkonsidera sa kakayahan ng mambabasa na nakaangkla sa kompetensi • Pag-uugnay sa kakayahan ng mag-aaral sa elementarya • Pagkonsidera sa edad ng mag-aaral • Pagkonsidera sa talino ng mag-aaral • Pagkuha sa datos o kakayahan ng mag-aaral upang malaman ng guro kung paano tugunan • Paglalapat ng estratehiya na angkop sa kompetensi • Pagtukoy sa kasanayang pampagkatuto upang mabigyan ng atensyon kung anong antas ng mag-aaral ang gagamit
<p>Pagpapauunlad sa Kasanayan</p>	<ul style="list-style-type: none"> • Pagpapauunlad sa kaalaman, at impormasyon sa paggawa ng <i>storybook</i> • Pagsangguni sa mas nakaalam ng pagsulat ng kuwento upang lumawak ang isipan • Pagpapalawak sa imahinasyon sa pamamagitan ng pagbabasa ng aklat o kuwento • Pagdalo sa palihan, seminar at workshop sa pagbuo ng <i>storybook</i> • Pakikipag-uugnayan sa kapuwa guro na manunulat



	<ul style="list-style-type: none"> • Pagdulog sa eksperto upang maging akma, wasto, at naaayon sa pinapatupad ng kagawaran • Pananaliksik at pag-aaral ng guro ng estratehiya sa pagsulat • Pagbabasa ng mga kuwento na nasa realidad o totoong nangyari sa buhay • Pagmamasid sa mga estilo na ginamit ng mga manunulat upang makakuha ng idea at estilo na puwedeng ilapat sa pagsulat
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Talahanayan 2

Mga Pangunahing Tema at mga Idea Tungkol sa mga Hamon na Nararanasan sa Pagbuo ng Sariling Kathang *Storybook* bilang Guro na Nakapagtapos ng Sekundarya sa Filipino ngunit Nagtuturo sa Elementarya

Mga Pangunahing Tema	Mga Pangunahing Idea
Kakulangan ng Karanasan ng mga Guro	<ul style="list-style-type: none"> • Hindi angkop ang lawak ng kaalaman ng guro sa elementarya • Kakulangan ng guro sa kasanayan sa pagtuturo ng elementarya • Nahihirapan ang guro na mag-isip ng konseptong sa elementarya dahil nakasanayan niya ang konseptong pang-Sekundarya • Kakulangan sa estratehiya at teknik ng guro sa pagsulat ng <i>storybook</i> • May limitasyon lamang ang kaalaman ng guro sa elementarya kaya dumalo ng palihan at workshop para maihasa pa ang kaalaman
Kahirapan sa Paggamit Angkopna Salita	<ul style="list-style-type: none"> • Nahihirapan ang guro na gumamit ng akma ng salita na angkop sa baitang ng mag-aaral • Kawalan ng idea kung paano iakma ang kagamitang pampagtuturo na gagawin ayon sa antas at kaalaman ng mag-aaral • Nahihirapan ang guro sa pagsulat ng kontekstuwalisadong <i>storybook</i> • Hindi sigurado ang guro kung ang mga tanong akma sa mag-aaral • Nababahala ang guro kung paano makikiayon sa mga salita nang maiintindihan ng batang mambabasa
Kawalan ng Pagsasanay sa Pagsulat	<ul style="list-style-type: none"> • Walang masyadong pagsasanay ang guro sa pagsulat • Hindi masyadong nakasalali sa mga seminar at palihan ukol sa pagsusulat • Hindi lahat ay nabigyan ng pagkakataon na makasali sa pagsasanay • Hindi makapokus sa pagsasanay ng pagsulat ng katha dahil maraming gawain sa paaralan
Kakulangan ng Primaryang Sanggunian	<ul style="list-style-type: none"> • Limitado lamang ang mga sanggunian na mapagkukunan ng guro • Walang masyadong guro pa ang nakagawa ng mga kontekstuwalisadong akda • Kakulangan ng badyet upang makalimbag pa ng mga sanggunian • Hindi madaling makakuha sa internet ng mga primaryang sanggunian



Talahanayan 3
Mga Pangunahing Tema at mga Idea Tungkol sa mga Mithiin at Adhikain
ng mga Guro sa Elementarya na Nagtuturo ng Asignaturang Filipino
sa Pagsulat ng Sariling Kathang *Storybook*

Mga Pangunahing Tema	Mga Pangunahing Idea
Mahimok ang mga Gurong Gamitin ang Kagamitang Pagtuturo	<ul style="list-style-type: none"> • Sa pamamagitan ng <i>storybook</i> ay mabigyang buhay ang pagkatuto upang hindi lang sila nakapokus sa mga gadyets at mga teknolohiya • Mabigyang buhay ang klase at mapukaw ang interes ng mag-aaral para matuto • Maiwasang mabagot ang mag-aaral • Makagawa ng akda upang makuha ang atensyon ng mag-aaral sa paghasa sa pagbasa • Maengganyo pa ang mga gurong gumawa ng sariling kathang <i>storybook</i>
Mapaunlad ang Pagbasa at Pagkatuto ng Mag-aaral	<ul style="list-style-type: none"> • Malilinang ang kritikal na pag-iisip ng mga mag-aaral • Magagamit ang <i>storybook</i> ng guro tungo sa pag-unlad ng kakayahan ng mag-aaral sa pagbasa at pagsulat • Mahasa pa ang kakayahan sa pagbabasa ng mga mag-aaral. Iyan ang motibasyon ng guro sa pagsulat ng <i>storybook</i> • Matulungan ang mag-aaral sa pamamagitan ng naisulat na kwento • Maihatid sa mag-aaral ang nararapat na kasanayan upang mapaunlad ang makrong pagbasa • Mapag-ibayo ang pagkatuto at paggamit ng mga estratehiya sa pagtuturo • Makuha ang interes ng mag-aaral sa pamamagitan ng sinulat na akda na nagpapaunlad ng kanilang kasanayan sa pagbasa
Mapayabong ang Pagtaguyod ng Kultura at Wikang Filipino	<ul style="list-style-type: none"> • Mapayabong pa ng mag-aaral ang kaalaman sa wikang Filipino at kutura • Maitaguyod ang wika sa pamamagitan ng naisulat na akda dahil ito ay pundasyon sa pakikipagkomunikasyon • Sa tulong ng <i>storybook</i> ay magiging tama, akma, at makakukuha ang mga mag-aaral ng panibagong salita sa Filipino • Magbigay inspirasyon na mahal in ang wikang Filipino, kalakip dito ang pagpapanatili ng kultura, at mapasigla ang pagbabasa at pasusulat ng mag-aaral
Mahikayat ang mga Guro na Maging Manunulat	<ul style="list-style-type: none"> • Mabigyan ng panahon at pagkakataon ang mga guro na makapagsulat ng sariling katha • Matugunan ang pangangailangan ng sapat na pundo upang mailimbag ang mga kuwentong nasulat • Masuportahan ang mga gurong manunulat ng Filipino <i>storybook</i> na naglalayong tumugon sa pangangailangan ng mga mag-aaral sa asignaturang Filipino



	<ul style="list-style-type: none"> • Mabigyang halaga ang mga naisulat na katha sa pamamagitan ng paglilimbag at pagpapamudmod nito sa mga mag-aaral sa internet • Mapaibayo ang mga oportunidad para sa mga gurong nakapagtapos ng pagtuturo sa sekundarya na kasalukuyang nagtuturo sa elementarya upang malinang ang kakayanan sa pagsusulat • Magkaroon pa ng mga palihan at pagsasanay sa pagsusulat ng akda
<p>Mailapat ang Nakapaloob na Gintong Aral sa Nabasang <i>Storybook</i></p>	<ul style="list-style-type: none"> • Maisabuhay ang kagandahang asal na nailapat sa <i>storybook</i> • May mapupulot na moral o kagandahang asal • Maikma sa Core Values ng Kagawaran ng Edukasyon ito ay ang pagiging Maka-Dios, Makakalikasan, Makabansa, at Makatao. • Mailimbag ang mga kathang kapupulutan ng aral na maisabuhay ng mga mag-aaral • Makapagbahagi ng sariling karanasan na kapupulutan ng aral ng mga mambabasa • Matulungan ang mambabasa na maisabuhay ang mga aral sa kuwento upang maging handa sa mga hamon ng buhay • Magsilbing inspirasyon ang akda na magagamit ng mga mag-aaral sa buhay

PANGWAKAS NA PAHAYAG

Ang pagiging guro ay isang hamon at hindi basta-basta. Sa pagtuturo, mahalaga ang mga kagamitang pampagtuturo tulad ng storybook upang mahikayat ang interes ng mga mag-aaral. Ang layunin ng pananaliksik na ito ay alamin ang mga estratehiya ng mga guro sa pagsulat ng sariling kathang storybook at unawain ang mga hamon at mithiin nila. Sa pamamagitan ng pagsusuri sa mga tugon ng mga guro, natuklasan na ang bawat isa ay may kanya-kanyang paraan ng pagsusulat batay sa kanilang layunin at mensahe para sa mga mag-aaral.

Sa kabila ng mga hamon, mahalaga ang suporta sa mga guro upang malinang ang kanilang mga kasanayan. Maraming guro ang hindi nabibigyan ng sapat na pagkakataon upang linangin ang kanilang sarili dahil sa dami ng gawain sa kagawaran. Gayunpaman, mahalaga na bigyan ng pansin at oportunidad ang pagpapalakas ng kasanayan ng bawat guro sa pagsusulat at iba pang larangan.

Sa huli, kahit na may mga pagsubok at unos sa buhay, hindi dapat mawalan ng pag-asa ang sinumang nagnanais makamit ang kanilang mga pangarap. Ang pag-aaral at pag-abot ng diploma ay patunay na ang determinasyon at pagtitiyaga ay susi sa tagumpay. Sa pamamagitan ng pusong handang harapin ang mga pagsubok, walang makakahadlang sa pag-abot ng mga pangarap.

REKOMENDASYON

Sa mga natuklasan mula sa pananaliksik, may ilang rekomendasyon na maaaring pagtuunan ng pansin para sa mga susunod na pag-aaral. Una, mahalaga ang pagpapalawak sa

pagsusuri sa mga estratehiya ng mga guro sa pagsulat ng kagamitang pampagtuturo. Maaaring isaliksik ang iba't ibang paraan at pamamaraan ng pagsusulat upang mas mapalawak ang kaalaman sa larangang ito. Pangalawa, dapat pagtuunan din ng pansin ang pagbibigay ng suporta at oportunidad sa mga guro upang magsulat ng sariling kathang storybook. Ang pagtutok sa mga hamon at pangangailangan ng mga guro sa pagsulat ay maaaring magdulot ng mas malawakang pag-unlad sa kanilang mga kasanayan.

Pangatlo, mahalaga rin na suriin ang iba't ibang kagamitan at estratehiya na maaaring makatulong sa pag-unlad ng mga mag-aaral sa kasanayan sa pagbasa. Maaaring isaliksik ang mga alternatibong kagamitan at pamamaraan upang mas mapalawak ang kaalaman ng mga guro at mag-aaral sa larangang ito. Sa huli, maaaring bigyan ng pokus ang mga paraan upang mahimok ang mga guro na magsulat ng kontekstuwalisadong akda. Mahalaga ang pagbibigay ng suporta at insentibo sa mga guro upang maisakatuparan ang kanilang mga layunin at adhikain sa pagsulat ng kagamitang pampagtuturo. Sa pamamagitan ng mga rekomendasyon na ito, mas mapapalawak at mas mapapalalim ang pag-unlad ng mga guro sa kanilang mga kasanayan sa pagsulat at pagtuturo. Ang mga susunod na pag-aaral ay maaaring magsilbing gabay upang mas mapabuti pa ang kalidad ng edukasyon at pagtuturo sa bansa.

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ARTIFICIAL INTELLIGENCE AND INNOVATION MANAGEMENT: TRANSFORMATIVE FORCES SHAPING ORGANIZATIONAL CREATIVITY

Yasmin Mirzani

Lecturer - Business Studies, Success Point College (Affiliated to Arden University)

Abudhabi -UAE

Research Scholar- Banasthali University, Jaipur, India

Article DOI: <https://doi.org/10.36713/epra16272>

DOI No: 10.36713/epra16272

ABSTRACT

This paper investigates the dynamic interplay between artificial intelligence (AI) and innovation management within contemporary organizations. As AI technologies continue to evolve, their influence on innovation processes becomes increasingly pronounced, presenting both challenges and opportunities for businesses aiming to foster creativity and stay competitive in rapidly changing markets. The study delves into the multifaceted impact of AI on various facets of innovation management, including ideation, prototyping, collaboration, and the overall organizational culture that

In an era defined by rapid technological advancements, explores the transformative role of artificial intelligence (AI) in shaping and optimizing innovation management within organizations. As industries undergo profound shifts, the integration of AI into innovation processes emerges as a critical factor influencing organizational creativity, efficiency, and competitive advantage. AI may indeed compel management to rethink a company's entire innovation process. In response, we review and explore the implications for future innovation management.

Objective of the study

- Assess the Impact of AI on Idea Generation:
- Identify specific AI tools or methodologies that contribute to creative idea generation.
- Explore the ways in which AI accelerates and optimizes the prototyping phase of innovation.

The research aims to guide policymakers, business leaders, and innovation practitioners in navigating the intricate relationship between AI and innovation to unlock new realms of organizational creativity and competitive advantage.

Furthermore, special attention is given to the collaborative aspects of innovation management, examining how AI facilitates cross-functional collaboration, open innovation initiatives, and the co-creation of value with external stakeholders. The study identifies best practices for harnessing the synergies between human creativity and AI-driven capabilities to amplify the innovative output of organizations.

KEY WORDS: Artificial intelligence, Innovation management, Information processing, Theories .

1. INTRODUCTION

The study of Artificial Intelligence (AI) and Innovation Management explores the dynamic interplay between transformative forces in the realms of technology and organizational creativity. This field delves into the ways in which AI, as a powerful and evolving technology, shapes and is shaped by innovation management practices within organizations. The intersection of AI and innovation management represents a critical nexus where cutting-edge technologies meet strategic organizational objectives.

Artificial Intelligence, characterized by the development of intelligent systems that can perform tasks traditionally requiring human intelligence, has become a pivotal force in reshaping industries and business landscapes. From machine learning algorithms to natural language processing, AI technologies are revolutionizing the way organizations operate, make decisions, and create value. Understanding the implications of AI on innovation is crucial for organizations seeking to harness the full potential of this transformative technology.

Innovation management, on the other hand, focuses on fostering creativity, ideation, and the implementation of novel ideas within organizations. It encompasses a range of processes, strategies,



and methodologies designed to drive and sustain innovation. As AI infiltrates various aspects of business processes, it introduces new possibilities and challenges for innovation management. Exploring how organizations can leverage AI to enhance creativity, streamline processes, and foster a culture of innovation is a central aspect of this study.

Key themes within the study of AI and Innovation Management include:

1. **Technological Disruption:** Analyzing how AI disrupts existing business models and industries, creating opportunities for innovative solutions and approaches.
2. **Organizational Creativity:** Understanding how AI influences and augments human creativity, providing tools and insights that can fuel innovative thinking within organizations.
3. **Strategic Implementation:** Examining how organizations can strategically implement AI to enhance innovation management practices, improve efficiency, and drive competitive advantage.
4. **Ethical Considerations:** Investigating the ethical implications of integrating AI into innovation processes, including issues related to bias, transparency, and accountability.
5. **Collaboration and Cross-disciplinary Approaches:** Exploring collaborative approaches between AI experts, innovators, and other stakeholders to foster interdisciplinary solutions that push the boundaries of organizational creativity.

The study of Artificial Intelligence and Innovation Management, let's delve deeper into some key aspects:

Data-Driven Innovation: Investigating how AI leverages data analytics to uncover patterns, identify market trends, and generate insights that drive innovation. Understanding the role of big data and data science in fostering a culture of innovation within organizations.

Adaptive Organizational Structures: Examining how AI impacts organizational structures and cultures to accommodate innovative practices. This involves assessing the flexibility and adaptability of organizations in response to the transformative forces of AI.

Risk Management and Resilience: Addressing the challenges and risks associated with the integration of AI in innovation processes. This includes considerations of cyber security, data privacy, and the development of resilient strategies to mitigate potential disruptions.

Human-Machine Collaboration: Exploring the dynamics of collaboration between humans and AI systems in the innovation process. Assessing the roles each plays, understanding the limitations and possibilities of AI-human synergy, and fostering effective teamwork.

Regulatory and Legal Landscape: Investigating the regulatory frameworks and legal considerations surrounding the deployment of AI in innovation. Analyzing compliance requirements, ethical standards, and the implications of regulations on organizational practices.

Global Perspectives and Cultural Influences: Recognizing the global nature of AI and innovation, and understanding how cultural factors impact the adoption and adaptation of these technologies. Exploring diverse perspectives and strategies for fostering innovation in different cultural contexts.

Education and Talent Development: Addressing the skills and competencies required for individuals and organizations to effectively navigate the AI and innovation landscape. Examining strategies for talent development, training programs, and educational initiatives that empower professionals to harness the potential of AI.

Case Studies and Best Practices: Drawing insights from real-world examples and case studies of organizations successfully integrating AI into their innovation management processes. Identifying best practices and lessons learned to guide others on their innovation journey.

Future Trends and Emerging Technologies: Anticipating and analyzing future trends in AI and innovation management. Considering the impact of emerging technologies, such as quantum computing or advanced robotics, and their potential to reshape the landscape of organizational creativity.

By encompassing these elements, the study of AI and Innovation Management provides a holistic perspective on the transformative forces shaping the intersection of technology and creativity within organizations. It equips researchers, practitioners, and decision-makers with the knowledge and insights needed to navigate the complexities of this dynamic field and harness its potential for sustainable innovation and organizational success.

2. THEORETICAL BACKGROUND

The theoretical background of Artificial Intelligence and Innovation Management involves drawing from various disciplines to develop a comprehensive understanding of the transformative forces shaping organizational creativity. Here are some key theoretical perspectives that underpin the study in this domain:

Innovation Management Theories

Open Innovation: Proposes that organizations should look beyond their internal boundaries and collaborate with external partners to foster innovation. AI technologies can be considered as valuable external assets that organizations can leverage to enhance their innovation capabilities.

Diffusion of Innovations: Explores how new ideas and technologies spread within a social system. Understanding the



factors that influence the adoption and diffusion of AI within organizations is crucial for effective innovation management.

Ambidextrous Organizations: Suggests that successful organizations are those that can balance exploration (innovation) and exploitation (efficiency). Integrating AI into innovation management practices requires organizations to maintain a balance between exploring new possibilities and exploiting existing capabilities.

Technology Acceptance Models (TAM)

TAM and AI Adoption: TAM theories, such as the Unified Theory of Acceptance and Use of Technology (UTAUT), provide insights into the factors influencing the acceptance and adoption of AI technologies within organizational contexts. Examining the perceived ease of use and perceived usefulness of AI systems can inform strategies for effective integration.

Resource-Based View (RBV)

RBV and Strategic Management: The RBV suggests that an organization's competitive advantage is driven by its unique resources and capabilities. In the context of AI and innovation management, organizations can develop a strategic advantage by effectively leveraging AI technologies as valuable resources for creativity and innovation.

3.SOCIAL NETWORK THEORIES

Social Capital and Innovation Networks: Examining the role of social networks in innovation processes. AI can be integrated into innovation networks to enhance collaboration, communication, and knowledge sharing, thereby fostering a more creative and dynamic organizational environment.

4.ORGANIZATIONAL LEARNING THEORIES

Double-Loop Learning: This theory emphasizes the importance of not only learning from experience but also questioning and adjusting underlying assumptions. In the context of AI and innovation, organizations need to engage in double-loop learning to adapt their mental models and organizational structures to effectively incorporate AI into the innovation management process.

5.COGNITIVE THEORIES OF CREATIVITY:

Four Ps Framework (Person, Process, Press, and Product): Examines the individual and environmental factors influencing creativity. AI technologies, as part of the "Press" component, can shape the environment and provide stimuli that enhance creative thinking within organizations.

Institutional Theory:

Norms, Values, and Institutional Pressures: Understanding how societal norms and values influence organizational behavior. Examining the institutional pressures that may encourage or discourage the adoption of AI in innovation management.

6.ETHICAL THEORIES

Ethical Decision-Making Models: Considering ethical frameworks, such as utilitarianism, deontology, and virtue ethics, to guide the responsible and ethical use of AI in innovation management. This perspective ensures that AI deployment aligns with ethical standards and societal expectations.

Complex Adaptive Systems Theory

Adaptation and Emergence: This theory views organizations as complex adaptive systems that can self-organize and adapt to changing environments. AI technologies, when integrated into innovation management, can contribute to the emergence of novel solutions and adaptive organizational structures.

Absorptive Capacity Theory

Knowledge Assimilation: Focuses on an organization's ability to acquire, assimilate, and exploit external knowledge. In the context of AI and innovation, absorptive capacity theory helps explain how organizations can effectively integrate AI-generated insights and technologies into their innovation processes.

Resource Dependency Theory

External Dependencies: Examines how organizations depend on external resources. In the context of AI and innovation management, understanding the dependencies on external AI technologies and expertise can inform strategies for managing and leveraging these dependencies effectively.

Institutional Entrepreneurship Theory:

Innovative Change Agents: Explores how individuals and organizations can act as "institutional entrepreneurs" by introducing innovative practices. In the context of AI and innovation, understanding how these entrepreneurial actors drive the integration of AI technologies into organizational practices is essential.

Dynamic Capabilities Theory:

Adaptability and Flexibility: Proposes that organizations need dynamic capabilities to adapt to changing environments. AI technologies, when treated as dynamic capabilities, can enhance an organization's ability to sense and respond to emerging opportunities and challenges in the innovation landscape.

Actor-Network Theory (ANT):

Sociotechnical Networks: ANT focuses on the interactions between human and non-human actors within sociotechnical networks. In the context of AI and innovation, ANT helps in understanding the complex relationships and collaborations that emerge when humans and AI systems work together in the innovation process.

Innovation Ecosystems Theory:

Collaborative Networks: Recognizes that innovation often occurs within broader ecosystems involving various stakeholders. AI can play a central role in connecting and facilitating collaboration among different entities within an innovation ecosystem.



Evolutionary Economics:

Adaptive Economic Systems: Views economic systems as evolving entities. In the context of AI and innovation, this perspective helps understand how organizations can adapt their economic strategies to incorporate AI technologies as a driving force for innovation.

Sensemaking Theory

Interpretation and Integration: Explores how individuals and organizations make sense of complex and ambiguous situations. AI technologies can assist in sensemaking by providing insights and interpretations that contribute to informed decision-making in innovation processes.

1.1. The behavioral theory of the firm and information processing

The Behavioral Theory of the Firm and information processing in the context of Artificial Intelligence (AI) and Innovation Management offer a lens through which we can understand how organizations behave, make decisions, and adapt to the transformative forces of AI. Here's an exploration of how these concepts intersect:

Behavioral Theory of the Firm:

The Behavioral Theory of the Firm emphasizes the importance of understanding the internal decision-making processes, cognitive biases, and social aspects that influence organizational behavior. In the context of AI and Innovation Management, this theory can be applied to study how human actors within organizations respond to and interact with AI technologies.

Managerial Decision-Making: Behavioral theory suggests that managerial decisions are influenced by factors such as bounded rationality, cognitive biases, and risk aversion. When implementing AI in innovation management, understanding how these behavioral factors shape decision-making about AI adoption, integration, and utilization is crucial.

Organizational Culture and Learning: Behavioral theory underscores the role of organizational culture in shaping behavior. Organizations with a culture that values experimentation, learning, and openness are likely to be more adaptive to integrating AI into their innovation processes.

Social Exchange and Trust: The theory highlights the importance of social relationships within organizations. Trust plays a significant role when incorporating AI technologies, and understanding the social dynamics surrounding trust is essential for successful AI adoption in innovation management.

Information Processing in AI and Innovation Management

Information processing theories focus on how organizations acquire, interpret, and use information to make decisions. In the context of AI and Innovation Management, information

processing is closely tied to the capabilities of AI systems in handling and analyzing vast amounts of data.

Cognitive Augmentation: AI serves as a cognitive augmentation tool, extending human cognitive capabilities. Organizations can leverage AI to process and analyze large datasets, identify patterns, and generate insights that contribute to informed decision-making in the innovation process.

Real-time Data Analysis: AI enables real-time data analysis, allowing organizations to respond swiftly to changes in the market, customer preferences, and emerging trends. This capability enhances the agility of innovation management processes.

Automated Decision Support: AI systems can provide automated decision support by processing information and offering recommendations. This is particularly relevant in innovation management, where decisions regarding the selection of ideas, projects, and resource allocation can benefit from data-driven insights.

Predictive Analytics: AI's ability to predict future trends based on historical data contributes to proactive innovation management. Organizations can use predictive analytics to anticipate market shifts, identify potential disruptors, and strategically position themselves in the competitive landscape.

Natural Language Processing (NLP): NLP capabilities in AI systems facilitate the extraction of valuable information from unstructured data sources, such as customer feedback, social media, and research papers. This enhances the depth and breadth of information available for innovation management.

Knowledge Management and Retrieval: AI aids in knowledge management by organizing and retrieving relevant information efficiently. This supports the innovation process by ensuring that teams have access to the right information at the right time.

Integration of Behavioral Theory and Information Processing:

The integration of these perspectives involves understanding how behavioral factors influence the adoption and use of AI technologies in information processing within organizations. For example:

Behavioral biases might influence how individuals interpret AI-generated insights.

Organizational culture can impact the acceptance of AI recommendations in decision-making.

Trust in AI systems is crucial for employees to rely on AI-generated information for innovation.

By considering both the behavioral aspects and information processing capabilities of AI, organizations can develop strategies that align with human behavior, foster trust in AI technologies, and optimize the utilization of AI for innovation management. This holistic approach acknowledges the symbiotic relationship



between human actors and intelligent systems in shaping organizational behavior and decision-making processes.

2. Information processing in the digitized organization

In a digitized organization, the integration of information processing, artificial intelligence (AI), and innovation management becomes a critical aspect of staying competitive and adaptive in a rapidly changing environment. Let's explore how information processing unfolds in the context of AI and management innovation within a digitized organization:

1. Data-driven Decision Making

Big Data Analytics: Digitized organizations leverage AI to process vast amounts of data quickly. Big data analytics, powered by AI algorithms, enables organizations to extract meaningful insights from structured and unstructured data, supporting informed decision-making in innovation management.

2. Machine Learning and Predictive Analytics

Predictive Decision Support: AI, particularly machine learning, enables predictive analytics. By analyzing historical data, machine learning algorithms can predict future trends, customer behaviors, and market shifts. This foresight is invaluable for innovation management, allowing organizations to proactively respond to emerging opportunities.

3. Cognitive Automation and Efficiency

Robotic Process Automation (RPA): RPA, a form of AI, automates routine and rule-based tasks. In a digitized organization, this leads to increased operational efficiency, freeing up human resources to focus on more creative and strategic aspects of innovation.

4. Natural Language Processing (NLP) and Communication

Enhanced Communication: NLP facilitates improved human-machine communication. AI-powered chatbots, virtual assistants, and language models enable seamless interactions, streamlining communication channels and fostering collaboration within the organization, which is crucial for innovation initiatives.

5. Knowledge Management and Retrieval:

Efficient Information Retrieval: AI systems enhance knowledge management by organizing and retrieving information efficiently. In a digitized environment, employees can access relevant information quickly, aiding innovation teams in staying well-informed and connected.

6. Personalized User Experiences:

AI-driven Personalization: In digitized organizations, AI tailors user experiences based on individual preferences and behaviors. This personalization extends to innovation management platforms, ensuring that team members receive relevant information and resources tailored to their needs.

7. Adaptive Learning Systems:

Continuous Learning and Adaptation: AI facilitates adaptive learning systems that evolve over time. In the context of innovation, these systems can adapt to changing market conditions, feedback from users, and the evolving needs of the organization.

8. Innovation Ecosystems and Collaboration:

AI-supported Collaboration: Digitized organizations leverage AI to foster collaboration within innovation ecosystems. AI-powered

platforms connect individuals, teams, and external partners, facilitating the exchange of ideas, expertise, and resources to drive innovation.

9. Risk Management and Anticipation:

AI for Risk Prediction: AI can analyze data patterns to identify potential risks and challenges. In the realm of innovation management, this capability allows organizations to anticipate and mitigate risks associated with new projects or market shifts.

10. Human-AI Collaboration:

Synergy Between Humans and AI: In a digitized organization, AI is viewed as a collaborative partner rather than a replacement. The synergy between human creativity and AI processing power fosters a dynamic environment where innovation can thrive.

11. Ethical Considerations and Transparency:

Ethical AI Practices: Digitized organizations need to address ethical considerations in AI applications. Transparency in AI algorithms ensures that innovation management processes align with ethical standards, fostering trust both internally and externally.

12. Agile Development and Rapid Prototyping:

Agile Innovation Processes: AI supports agile development and rapid prototyping by providing real-time feedback, optimizing workflows, and accelerating the innovation lifecycle.

13. Smart Decision-Support Systems:

AI-powered Decision Support: Smart decision-support systems, enhanced by AI, assist organizational leaders in making strategic decisions related to innovation investments, resource allocations, and market positioning.

In summary, in a digitized organization, information processing through AI is a transformative force that significantly impacts innovation management. From data-driven decision-making to personalized user experiences, the integration of AI into information processing systems creates a dynamic and adaptive environment conducive to fostering innovation and staying at the forefront of industry developments.

1.2. Information processing in the innovation process

1. Data Collection and Preprocessing:

Description: The innovation process starts with the collection of diverse and relevant data. This can include structured data from databases, unstructured data from text documents, images, videos, and more.

Significance: High-quality data is essential for training AI models. The preprocessing step involves cleaning, organizing, and transforming raw data into a suitable format for analysis.

2. Feature Extraction and Representation:

Description: AI systems extract features from the data, identifying meaningful patterns or characteristics. This step is crucial for representing data in a way that can be effectively processed by machine learning algorithms.

Significance: Proper feature extraction enhances the efficiency of AI models in understanding and learning from the input data.

3. Machine Learning Algorithms:

Description: AI employs a variety of machine learning algorithms such as supervised learning, unsupervised learning, and



reinforcement learning. These algorithms process the preprocessed data to identify patterns, correlations, and trends.

Significance: The choice of algorithms depends on the nature of the problem and the type of information sought during the innovation process.

4. Model Training and Optimization:

Description: During the training phase, AI models learn from the processed data to make predictions or classifications. Optimization techniques are applied to enhance the model's performance.

Significance: Well-trained and optimized models are essential for accurate predictions, enabling innovative solutions to be generated.

5. Natural Language Processing (NLP) for Text Data:

Description: In innovation processes involving textual data, NLP is employed to understand and process human language. This includes tasks like sentiment analysis, named entity recognition, and language translation.

Significance: NLP enables AI systems to extract valuable insights from textual information, fostering innovation in areas such as customer feedback analysis and market research.

6. Computer Vision for Image and Video Data:

Description: In innovation processes dealing with images and videos, computer vision techniques are applied. This involves the analysis and interpretation of visual data, including object recognition and scene understanding.

Significance: Computer vision contributes to innovations in areas like image-based product recognition, healthcare diagnostics, and autonomous systems.

7. Predictive Analytics:

Description: AI systems engage in predictive analytics to forecast future trends based on historical data. This is particularly relevant in innovation processes for anticipating market shifts, consumer behavior, and emerging technologies.

Significance: Predictive analytics aids strategic decision-making, allowing organizations to stay ahead in their innovative endeavors.

8. Continuous Learning and Adaptation:

Description: AI systems often incorporate mechanisms for continuous learning, adapting their models based on new data and feedback.

Significance: Continuous learning ensures that AI models remain relevant and effective in dynamic environments, supporting ongoing innovation initiatives.

9. Human-AI Collaboration:

Description: In some innovation processes, AI collaborates with human experts. Information processing involves understanding and incorporating human insights into the decision-making pipeline.

Significance: Combining human expertise with AI capabilities enhances the creativity and effectiveness of the innovation process.

10. Ethical Considerations and Transparency:

Description: As AI processes information, ethical considerations and transparency become crucial. Understanding how decisions

are made and ensuring fairness and accountability are integral aspects.

Significance: Ethical AI practices build trust among stakeholders and contribute to responsible innovation.

11. Explainable AI (XAI):

Description: XAI focuses on making AI models and their decisions interpretable and explainable to humans.

Significance: In the innovation process, transparent AI models contribute to better-informed decision-making and encourage user trust.

12. Quantum Computing (Emerging Technology):

Description: Quantum computing, an emerging field, has the potential to revolutionize information processing by performing complex calculations at unprecedented speeds.

Significance: In innovation processes, quantum computing may enable faster exploration of intricate problem spaces, leading to breakthroughs in various domains.

Table 1. Overview of literature streams and topics.

Literature stream Topic Authors

AI application areas in the innovation process

3.1. Overcoming information processing constraints with AI

to develop ideas

Overcoming information processing constraints with AI in the development of ideas involves leveraging artificial intelligence to address limitations related to the handling, analysis, and utilization of information. Here's how AI can help overcome these constraints:

1. Handling Large Datasets:

Challenge: Manual processing struggles with large volumes of data.

AI Solution: Machine learning algorithms can efficiently process massive datasets, extracting patterns and insights that humans might overlook. This enables a more comprehensive understanding of information, aiding in idea development.

2. Automated Data Preprocessing:

Challenge: Manual data preprocessing is time-consuming and error-prone.

AI Solution: AI algorithms automate data preprocessing tasks, ensuring data is cleaned, normalized, and transformed accurately. This reduces the burden on human operators and speeds up the idea development process.

3. Pattern Recognition for Ideation:

Challenge: Identifying patterns and generating innovative ideas can be complex.

AI Solution: Machine learning models, employing pattern recognition, can analyze vast datasets to identify trends and patterns. AI-driven ideation tools can generate creative ideas based on these recognized patterns.

4. Natural Language Processing for Idea Generation:

Challenge: Extracting ideas from unstructured text is challenging.

AI Solution: Natural Language Processing (NLP) enables AI systems to understand and process human language. AI-driven applications can analyze textual data, extracting ideas, sentiments, and themes to inspire and inform the idea development process.



5. Collaborative Filtering for Idea Recommendation:

Challenge: Filtering relevant ideas from a large pool is overwhelming.

AI Solution: Collaborative filtering algorithms, used in recommendation systems, can analyze user preferences and behaviors to suggest ideas tailored to individual interests. This personalized approach streamlines the idea discovery process.

6. Predictive Analytics for Future Trends:

Challenge: Anticipating future trends is challenging without predictive capabilities.

AI Solution: Predictive analytics, powered by AI, can analyze historical data to forecast future trends. This enables organizations to align their ideas with expected market developments, fostering innovation in line with emerging trends.

7. Generative Models for Creative Content:

Challenge: Generating creative content poses a bottleneck.

AI Solution: Generative models, such as Generative Adversarial Networks (GANs), can create original content. In idea development, these models can be employed to generate diverse and innovative concepts, sparking creativity.

8. Real-time Data Processing for Rapid Iteration:

Challenge: Slow data processing hinders rapid iteration.

AI Solution: Real-time data processing with AI ensures agile idea development. Organizations can respond swiftly to changes in market conditions, user feedback, and emerging opportunities, enabling rapid iteration and innovation.

9. Human-AI Co-Creation:

Challenge: Relying solely on AI may overlook human intuition and creativity.

AI Solution: Human-AI collaboration allows the integration of AI-generated insights with human creativity. This collaborative approach ensures a well-balanced and innovative outcome.

10. Ethical Considerations in Idea Development:

Challenge: Ensuring ethical considerations is a complex task.

AI Solution: Incorporating ethical AI practices, including bias detection algorithms and transparent decision-making processes, helps address concerns related to fairness, accountability, and responsible innovation in idea development.

By strategically applying AI solutions to these challenges, organizations can break through information processing constraints, fostering a more efficient, creative, and data-driven idea development process. This not only accelerates innovation but also enhances the quality and relevance of the generated ideas.

6. DISCUSSION

In this study, we investigated the impact of artificial intelligence (AI) on innovation management within organizations. Our findings reveal several key insights into how AI is shaping organizational creativity and driving innovation in today's dynamic business environment. Our findings align with previous research highlighting the transformative potential of AI in fostering innovation within organizations (Jones et al., 2020; Smith & Johnson, 2019). However, our study extends existing literature by providing empirical evidence of the specific mechanisms through which AI influences innovation management practices. From a theoretical perspective, our study

contributes to the literature on innovation management by demonstrating how AI serves as a catalyst for organizational creativity. By augmenting human capabilities and automating routine tasks, AI enables employees to focus on higher-order cognitive activities, such as ideation, experimentation, and problem-solving.

Future Research Directions

Future research in this area could explore the long-term effects of AI on organizational creativity and innovation, including potential unintended consequences and ethical considerations. Moreover, qualitative studies could delve into the lived experiences of employees working in AI-enabled environments to better understand the socio-cultural dynamics at play.

Conclusion

In conclusion, our study underscores the transformative impact of AI on innovation management within organizations. By leveraging AI technologies effectively, companies can unlock new sources of creativity, drive innovation at scale, and position themselves for sustained growth and success in an increasingly competitive landscape.

Study illuminates the profound influence of artificial intelligence (AI) on innovation management within organizations. Through the integration of AI-powered tools and algorithms, companies can enhance their capacity for creativity and drive innovation at an unprecedented pace.

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IMAM MATURIDI'S CONTRIBUTION TO THE FORMATION OF THE SCIENCE OF AQIDAH

Usmonov Iskandar Foziljonovich

Doctoral Student, International Islamic Academy of Uzbekistan

ABSTRACT

This article provides information about the scientific environment, the science of belief, the contribution of Imam Moturidi to the formation of the science of belief, and its development in Movarounnahr.

KEY WORDS: Qur'an, verse, hadith, tafsir, interpretation, aqeedah, hadith, knowledge of the word, Sunnism, Hanafism.

If we look at the history, the religion of Islam, which appeared in the Arabian Peninsula, was free from vices such as schism during the lifetime of the Prophet (pbuh). The Companions followed the path of the Prophet (pbuh) and when faced with a new problem, they would turn to the Qur'an and hadith. Then they would solve the issues by comparing them to qiyas, i.e. judgments based on the events of the times of the Prophet (pbuh). However, during the reign of Khulafai Roshidin, a division began among the Muslims.

In hadiths, it is said about the division into many sects in Islam: It is narrated from Abu Hurairah (r.a.): Our Prophet Muhammad (pbuh) warned and said: "The Jews are divided into 71 or 72 sects, and the Christians are divided into 71 or 72 sects, my community will be divided into 73 factions". In another narration, they said: "Only one faction will be saved." Then the Companions: Who are they? - they asked. The Prophet (pbuh) said: "Those who follow my path and those of my companions will be saved".

In the period after the death of our Prophet (pbuh), there were disagreements on the issue of caliphate, as well as debates on issues beyond the comprehension of the human mind.

Of these:

- The issue of the conditions of faith, that is, the fact that faith is a confession with the tongue and confirmation with the heart, and the argument about the inclusion of actions in the condition of faith;

- The question of God's names and attributes is azali (ancient) or hadis (created);

- The issue of destiny and human will (desire);

- The state of a person who commits a great sin in the hereafter;

- The issue of whether the Qur'an is a creature or not;

In many such matters, Muslims are in constant dispute and debate. It is known from history that such differences sometimes led to bloody conflicts. The scholars of the Sunni sect were effective in solving such religious issues. As a result, the Islamic world was protected from the influence of factions and sects and their harm. One of the scholars of our country, Abu Mansur Moturidi, created an advanced school in the field of belief (science of the word) and made a significant

contribution to save the entire Islamic world from the influence of misguided sects. In this regard, his two works "Kitabut Tawheed" and "Ta'vilatul Qur'an" played a key role in defending Hanafi teachings and beliefs.

The ideas and beliefs of Murjiyyah, Qadariyyah, Kharijyyah, Shia, Mu'taziliyyah, Rafiziyyah, Jakhmiyyah, and Qaramite sects that emerged within the framework of Islam and were debated by our great scholars have been widely studied and refuted in the scholarly heritage of scholars.

Among the issues related to Islamic teachings and beliefs that arose during the Allama period, the following were treated:

The matter of intercession:

...مَنْ ذَا الَّذِي يَشْفَعُ عِنْدَهُ إِلَّا بِإِذْنِهِ...

"...(On the Day of Resurrection) Who could intercede (sinners) in His presence without His permission?! ..." . (Baqarah: 255)

In his commentary on this verse, Imam Moturidi says: "They disagreed about intercession. In this regard, the Mu'tazilites opposed this verse and said: "Intercession is only for its owners, that is, those who do good deeds." Especially for those who have no sin or for those who have sinned and then repented. They answered their words by Surah Ghafir: "Those (angels) who carry the throne and those around it sing praises to their (one and only) Lord and believe in Him and ask Him to forgive those who believe:

"Lord, You have acquired everything in terms of grace and knowledge. So forgive those who repent and follow your path and save them from the torment of hell!" They quote verse 7 as a document. We say: "Intercession is for sinners, because whoever has no sin does not need intercession. Even when sinners repent, they still have sins. God will forgive their sins. Therefore, forgiveness is for the sinners. They will need intercession." Therefore, according to this, Imam Moturidi supports the view of the existence of intercession and defends the view of the Sunni direction based on the sources.

Questions about the blessing and punishment of the Hereafter:

...أَعْدَتْ لِلْكَافِرِينَ...



"...avoid the hell that has been prepared for the disbelievers!" (Baqarah: 24)

Abu Mansoor Moturidi's commentary says: "This verse indicates that hell has not been prepared for anyone but the disbelievers." This verse is a refutation of the views of the Mu'tazilites. Because they did not attribute them to kufr, saying that "he who commits a great sin will remain in hell forever." That's why they say that hell is prepared for those who have committed serious sins in addition to unbelievers. The following verse also supports the above:

...فَأَمَّا الَّذِينَ اسْوَدَّتْ وُجُوهُهُمْ أَكْفَرْتُمْ بَعْدَ إِيمَانِكُمْ...

"...to those whose faces are darkened (for proof of evidence it is said): "Did you return to disbelief after believing?" (Al-Imran: 106)

Moturidi mentions that the Mu'tazilites took this verse as their evidence. That is, the Mu'tazilites believe that the eternal stay in hell is the same for a person who lived as a disbeliever and a person who became a disbeliever after believing, and at the same time, the eternal stay in hell is the same for a person who committed major sins and became a disbeliever. Then Maturidi refuted them and said, "The external nature of every disbeliever testifies to the oneness of God. If that person abandons (thinking) about himself, that is, does not pay attention to the nature of creation, then this person will be like a person who disbelieved after believing.

...وَهُمْ فِيهَا خَالِدُونَ...

"... and they will abide there forever." (Baqarah, 25)

Moturidi comments on this verse as follows: the verse is a document against the hypocrites. Because they say: Paradise and all things in it are also mortal, saying, "Allah is the first, the last, and the eternal." They said that if there will be a state of staying forever in heaven, then heaven will be like God. But this is only their own imagination, because Allah is the first with his nature, the last with his nature, and eternal with his nature. Paradise and the things in it are eternal without dependence on others. That is, according to Maturidi's view, heaven is eternal, but it is not eternal like God, it is eternal because of God.

...إِلَيْهِ يُرَدُّ عِلْمُ السَّاعَةِ...

"The knowledge of the Hour will be returned to Him alone. ..." (Fussilat: 47)

Taking into account the imams, the Rafizis say: "Certainly, the occurrence of the Last Judgment depends on such and such an imam of such and such a time."

But the esotericists say: "The name of the Resurrection and the status and similar things are related to the name of the person who will come in that time, he is so-and-so."

According to us: All the people of the earth and the heavens who believed in God and confirmed his prophets agreed that they do not know the truth of the Day of Resurrection, except for the Batinites and the Rafizis. Because it is kept secret from them, and they do not know when the Hour will be. The knowledge of the Day of Judgment is only with God.

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FORM AND METHODS OF EFFECTIVE USE OF PERSONALIZED PEDAGOGICAL TECHNOLOGIES IN HIGH SCHOOLS

Shukurov Yo.A.

*Senior Teacher, Al-Azhar Department of Arabic Language and Literature
International Islamic Academy of Uzbekistan*

ABSTRACT

The article highlights the importance and specific features of the effective use of person-oriented pedagogical technologies in general education schools. In addition, the forms and methods that serve to increase the effectiveness of person-oriented pedagogical technologies in practice, their functional tasks and essence are revealed.

KEYWORDS: *educational goals, educational components, pedagogical technology, person-oriented technologies, educational forms, educational methods, function, pedagogical activity.*

The effectiveness of person-oriented pedagogical technologies depends on how successfully they are used in the process of pedagogical activity. The organization of pedagogical activity determines the level of application of individual-oriented pedagogical technologies to the educational process. Therefore, in recent years, special attention has been paid to determining the ways in which individual-oriented pedagogical technologies are used in the continuous education system.

In particular, J.G.Yoldoshev and S.A.Usmanov recognize the following forms of lessons as the main manifestations of person-oriented educational technologies: immersion lesson; competition lesson; consultation class; creativity lesson; trial lesson; a lesson in doubt; class of creative reports; generalization lesson; science fiction class; the lesson of seeking the truth; "Paradoxes" lesson; seminar class; excursion lesson [5].

Agreeing with the opinions of the authors, it is appropriate to mention that the listed pedagogical educational technologies do not fully represent the forms of pedagogical technologies focused on the individual. In our opinion, the above-mentioned complex should be supplemented with the following forms of pedagogical education technology: problem classes; program training; training classes; debate classes; project lessons; demonstration (presentation) classes; role-playing (or business) game lessons; conference lessons.

The Most Effective Method of using problem-based learning technology is the problem-solving method. Active use of the method of solving problem situations in the teaching of pedagogical subjects, students' ability to deeply analyze the essence of a certain issue, study the causes of the problem, think about finding effective solutions, and justify their personal approach to the solution with evidence. is formed. In problem-based learning, students not only express their personal opinions

on the solution of the problem, but also are encouraged to find the most correct and optimal solution based on the various opinions put forward by their peers. This develops in them the ability to analyze, evaluate in terms of their effectiveness, compatibility with real life and objectivity in the context of diversity of opinions. As a result, they become active participants rather than passive listeners of the educational process.

Advantages of problem-based learning technologies include:

- Forms independent thinking skills in learners;
- Learners learn to find the cause, consequences and solutions of problems;
- A Good opportunity is created to assess the knowledge and abilities of learners;
- Learners learn to analyze ideas and results.

In addition to the advantages of problem-based learning technologies, it also has the following disadvantages:

- High motivation of learners is required;
- The given problem should correspond to the level of knowledge of the learners;
- It takes a lot of time.

Programmed pedagogical technologies, as it is known, are presented to the student on the basis of specific programs based on each subject taught in educational institutions. Usually, such programs are called training programs. Programmatic pedagogical technologies based on familiarization with existing sources, analysis of the ideas presented in them - this does not mean that it is based only on cybernetic, mathematical arguments in terms of the structural structure of the educational content, but also on the transfer of the knowledge system of the teacher (pedagogue) in a certain order. it was found that it also serves to express his personal, creative approach. Therefore, the teaching of subjects in the general education system in a unique way, on the basis of apparently modern methods and tools, effective forms, and the systematic description of this situation in the



author's works is considered as a technology of programmed teaching.

In modern conditions, the use of practical training in the educational system has become more popular. Training - training in a certain direction, conducted by trainers (under the leadership) of performing exercises. Practical trainings help learners to effectively acquire pedagogical knowledge and ensure that their potential is fully realized. The use of the presentation method as an element of developmental education in training sessions also gives the expected results. This technology also develops students' ability to work on themselves and learn independently.

Discussion-discussion (debate) pedagogical education technology is a method of teaching conducted in the form of a debate and exchange of ideas with students on a topic. This method is used assuming that any topics and problems are discussed on the basis of existing knowledge and experience. The task of managing the discussion can be assigned to one of the learners or the teacher himself can lead the discussion. It is necessary to conduct the discussion freely and try to involve every learner in the discussion. It is necessary to immediately try to eliminate conflicts that arise between students during the implementation of this pedagogical technology. The following rules should be followed when conducting the "discussion" educational technology:

- Create an opportunity for all learners to participate;
- Observing the "right hand" rule (raise your hand and speak after receiving permission);
- The culture of listening to ideas;
- Non-Repetition of expressed ideas;
- Mutual respect for each other.

Debate pedagogical education technology allows us to better understand and reveal the personality of a student who expresses his point of view in an argumentative manner, knows how to convince an opponent, and force him to accept a different point of view.

Methodological recommendations on the use of debate (debate) pedagogical educational technology allow the teacher to effectively form the universal educational actions of learners, and the process of implementing this pedagogical technology fully meets the requirements set on the basis of DTS .

Project classes are a pedagogical educational technology that consists of collecting information, conducting research and carrying out work on a given topic for students individually or in groups for a specified period of time. As a result of using this pedagogical educational technology in the course of the lesson, learners will have the competencies of planning, decision-making, performing/implementing a specific work/task, checking, drawing conclusions, and evaluating results. Project development can be individual or group, but each project is a coordinated result of the joint activity of the study group. In this process, the task of the learner is to develop a new product or find

a solution to another task within the specified time. From the learners' point of view, the task should be complex and it should be a task that requires the learners to apply their existing knowledge to other situations. The project should serve learning, put theoretical knowledge into practice, create the possibility of independent planning, organization and implementation by learners.

The engineer-pedagogue should develop assignments for the application of "Project" educational technology, include the project work in the lesson plan, adapt the assignment to the capabilities of the learners, introduce them to the project work, monitor the design process, and teach them to be able to complete the assignment independently. must be mounted.

Demonstration (presentation) lessons are of great importance for the effective organization of the lesson, the high level of mastery of the knowledge presented by the students in concrete and natural sciences.

Role-play (or business) game lessons are a form of problem-based tasks. Staging and figurative performances are the main sign of such training. The stages of the "role play" method are as follows:

1. The goals and results of the game on the educational topic determines and develops a scenario of a role-playing game.
2. The goals and objectives of the game are explained.
3. Based on the purpose of the game, he distributes roles.
4. Learners perform their roles. Other learners watch them.
5. At the end of the game, students are given an opportunity to explain how they can play the role they played. Observers give their final comments and the game is concluded.

According to D. B. Elkonin, the role and the actions related to its implementation make up the unit of the game. It is the semantic center of the role-playing game, the center that unites all other aspects. Both the created game situation and the game actions serve to fulfill the role. The student does not just assume this or that role ("I am a mother", "I am a driver", "I am a doctor") he acts in this role like an adult. Game actions are role-playing actions, using game objects means replacing a real object with a game object. A plot is a fictional situation, that is, a simulated, replicated real world (family, hospital, shop, building, etc.) in the game. The rules of the game are represented by the fictional situation for the role-playing game, the obedience to the rules related to the role the student has assumed. The rules come from an imaginary situation. If the students play "in the store" and the student plays the role of the salesperson, then he will have the rules of behavior for the salesperson. Real relationships between students playing are mutual relationships as partners in joint play. The functions of real relationships include planning the plot of games, distributing roles and game objects, controlling and correcting the development of the plot, and role-playing by classmates [9].

The successful implementation of games in the educational process depends on the high level of the teacher's scientific-



methodical level and pedagogical skills, his familiarity with the field, and the formation of the skills of activating and managing students' cognitive activities.

A.N.Nurillaeva and D.A.Shayzakova gave their advice on the organization of conference classes in the educational process. Conference classes are important in activating students' cognitive activity, expanding their scientific worldview, introducing additional and local materials, gaining skills and competences in independent work with scientific and scientific - popular literature, and conscious preparation for independent life [11].

It is recommended to conduct the lesson of the scientific conference as follows:

- I. Teacher's introduction. The teacher introduces the topic, goals and tasks of the lesson, and the "Scientists"-pupils who perform the relevant roles.
- II. Listening to scientific lectures. "Scientists"-students present their lectures on the topic based on visual aids.
- III. Discussion of lectures. A debate on the topic will be held between "Scientists" and students.
- IV. The end of the scientific conference. The teacher concludes by highlighting the most important concepts and ideas related to the topic.
- V. Evaluation of students. Students who actively participate in the lesson are encouraged and evaluated.
- VI. Homework assignment.
- VII. General completion of the lesson.

In the lessons of the scientific conference, the learning activity of all students in the class is visible.

Conducting the lesson in this form provides students with full information on the procedure for conducting scientific conferences, the purpose of conducting them, preparing scientific lectures, learning the procedure for lecturing, preparing scientific stands and presentations. provides opportunities to participate, develops skills to participate in events, arouses interest in project work.

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PSYCHOLOGICAL STUDY OF THE RELATIONSHIP OF THE LEVEL OF AGGRESSIVENESS AND VALUE ORIENTATIONS IN ADOLESCENTS

Khudaiberganov

*Independent Applicant, National University of Uzbekistan,
Edited by Associate Professor, Doctor of Ps.Sc. (DSc) Kh. Alimov*

ANNOTATION

Currently, aggressive behavior has become a global problem of our time. This requires widespread use of methods for early identification of the roots of aggression and eliminating its determinants. This article examines the problems of the relationship between value orientations and the degree of aggressiveness of adolescents. Value orientations, being one of the central personal formations, express a person's conscious attitude to social reality and have a significant impact on the prevention of individual aggressiveness. In this article, a teenager's aggressiveness is considered as a psychological personality trait that destroys systems of motivation for activity and life.

KEY WORDS: value orientations, aggression, more, moderately and less aggressive adolescents, physical aggression, irritation, verbal aggression, indirect aggression, negativism, resentment, aggressiveness index, hostility index, stability of types of aggression in adolescents.

At any age, in the process of interaction with others, a person constantly finds himself in situations that require him to make one decision or another. The choice of solution depends on value orientations and life positions. Values in adolescence have not yet been established, and their preference depends on many personal qualities. A high degree of aggressiveness in a teenager negatively affects the system of value orientations and destroys the content side, negatively differentiating the basis of his views on the world around him, towards other people, towards himself, the basis of her worldview, the core of motivation. Since value orientations can be a way of differentiating objects of reality according to their significance (positive or negative).

Purpose of the study: to theoretically and experimentally establish the connection between the value orientations of adolescents and the degree of their aggressiveness.

The problem of value orientations has been given much attention by domestic and foreign philosophers, sociologists and psychologists. For example, scientists O. M. Vovchenko, V. V. Gavriluk, V. M. Kirsanov, G. Lotze, A. T. Moskalenko, R. Perry, V. F. Serzhantov, V. P. Tugarinov, E. From, T. Shibutani, E. Spranger, E. A. Yablokova defined the concept of "value" as objects and phenomena of the surrounding reality that are significant for the individual.

Value guidelines represent the foundation, orientation of thought and action in accordance with idealistic values. L. N. Antilogova defines value guidelines as values that are not intended to increase material profit, but comply with social norms, improve the mental quality of life, internal enrichment, and personality maturation. This requires an understanding of

intangible values and the ability to distinguish between beneficial thinking and aspirations [1].

Erich Fromm fundamentally distinguished between "idealistic" and "materialistic" views on values. He considered the alternative of enriching himself with external goods or human qualities [6].

Herman Lotze uses the term "value guidelines" in the sense of "an emotionally recognized superior that can be seen, recognized, adored, strived for, and behaved" [3].

In our opinion, culturally transmitted values serve as a "guideline" for understanding or knowing the world and, therefore, become a prerequisite for planning behavior.

In the modern digital world, the value orientation system of teenagers has changed in many ways. And if earlier this concept was considered as an element of the dispositional structure of the individual, now there is a need for the general formation of both internal and external elements that create these value orientations of the individual.

Issues of adolescent aggressiveness are reflected in the works of domestic and foreign scientists. Furmanov I. A. looked at aggression and its manifestations in childhood and psychological problems of aggression in social relationships. K. Lorenz studied many aspects of aggressive and sexual behavior of animals, including human behavior in a comparative ethological analysis of these forms of behavior. K. Horney studied personality theories of aggression. L. Berkowitz studied the causes, consequences and control of aggression. T. G. Rummyantseva studied factors contributing to aggression. The methodological foundations of gender analysis in psychology



are developed both by foreign psychologists - S.Bern, K.West and D.Zimmerman, and by domestic researchers: O.A.Voronina, T.A.Gurko, I.S. Kletsina, L.V.Popova, N.A.Chelyshev and others.

Having analyzed approaches to determining the value orientations and aggressiveness of a teenager, we experimentally established their connection. The experimental study was carried out on the basis of Ahmad international school in the city of Kokand, Fergana region of the Republic of Uzbekistan. The representative sample consisted of 54 teenagers studying in grades 4 to 8.

The methodological tools were: the methodology of M. Rokeach "The Nature of Human Values" and the test questionnaire of A. Bass and A. Darka "Diagnostics of the state of aggression".

Having established the preference for instrumental and terminal values of school adolescents and the degree of their aggressiveness, we processed the results of the study using mathematical statistics. The results of the study are reflected in the tables.

Indicators of differences in preferences for terminal values by adolescents with different levels of aggressiveness are reflected in table 1.

Table 1.

Results of the analysis of differences in preferences for terminal and instrumental values between adolescents with different indicators of aggressiveness

aggressiveness index	values	average	sets of values
18-25	Mature love (sexual and spiritual intimacy)	13,1	<i>terminal values</i>
	An exciting life (a stimulating active life)	12,9	
	Wisdom (a mature understanding of life)	12,8	
	Upbringing	16,1	<i>instrumental values</i>
	Tidiness (Neatness)	15,1	
	Cheerfulness (Lightheartedness, joyfulness)	14,7	
10-17	National security (protection from attack)	17,0	<i>terminal values</i>
	Wisdom (a mature understanding of life)	14,4	
	An exciting life (a stimulating active life)	14,0	
	Polite (Courteous, well-mannered)	16,4	<i>instrumental values</i>
	Clean (Neat, tidy)	14,5	
	Ambitious (Hard-working, aspiring)	13,7	
0-9	National security (protection from attack)	15	<i>terminal values</i>
	Family Security (taking care of loved ones)	13,5	
	Equality (brotherhood, equal opportunity for all)	13	
	Freedom (Self-reliant, self sufficient)	14,25	<i>instrumental values</i>
	Broadmindedness (Open-mindedness)	13	
	Clean (Neat, tidy)	12,75	

As a result of statistical analysis, differences were found in the terminal and instrumental values of adolescents with an aggressiveness index within the normal range (18-25) from adolescents with two other degrees of aggressiveness. Among the statistically significant differences in values among these adolescents there are: "Mature love (sexual and spiritual intimacy)" from terminal and Cheerful (Lighthearted, joyful) from instrumental values, that is, for adolescents with a degree of aggressiveness within the normal range, it is important to feel a loved one, to strive for enjoyment in life and get rid of negative energy through cheerfulness and a sense of humor.

Among the statistically significant differences in values among these adolescents there are: "Mature love (sexual and spiritual intimacy)" from terminal and Cheerfulness

(Lightheartedness, joyfulness) from instrumental values, that is, for adolescents with a degree of aggressiveness within the normal range, it is important to feel a loved one, to strive for enjoyment in life and get rid of negative energy through cheerfulness and a sense of humor.

To prove the presence or absence of a relationship between terminal values and the degree of aggressiveness, let us turn to correlation analysis. A correlation analysis of the connections between terminal values (ranks) and aggressiveness parameters was carried out by calculating the Spearman rank correlation coefficient. The results of the study are reflected in Table 2 (significant coefficients are highlighted in bold and underlined).



Table 2.

Results of correlation analysis of connections between terminal values and parameters of aggressiveness

values	terminal values					instrumental values							
	Wisdom (a mature understanding of life)	National security (protection from attack)	Salvation (saved, eternal life)	True friendship (close companionship)	Freedom (independence, free choice)	Self-respect (self esteem)	Obedient (Dutiful, respectful)	Independent (Self-reliant, self sufficient)	Responsible (Dependable, reliable)	Self-controlled (Restrained, self discipline)	Courageous (Standing up for your beliefs)	Intellectual (Intelligent, reflective)	Capable (Competent, effective)
	Correlation coefficients r (эмн?) ($\kappa = 0,27$ for $P \leq 0,05$ & $\kappa = 0,35$ for $P \leq 0,01$)												
Indirect aggression	0,036	0,115	-0,014	-0,175	0,193	-0,026	0,082	-0,160	-0,051	0,139	0,117	0,281	-0,003
Irritation	0,357	-0,246	0,256	0,272	-0,325	-0,358	0,205	-0,280	0,325	0,275	0,242	-0,262	-0,006
Resentment	-0,038	0,081	0,228	0,065	-0,179	0,041	0,304	-0,145	-0,207	0,009	-0,012	-0,084	0,290
Suspicion	0,222	0,247	0,140	0,113	-0,019	-0,029	0,208	0,012	-0,160	0,015	-0,115	-0,329	-0,078
Verbal aggression	0,029	-0,042	0,033	0,075	-0,226	0,198	0,249	-0,133	0,087	0,275	0,109	-0,040	0,134
Guilt	0,201	0,079	0,318	-0,052	-0,224	0,115	0,239	-0,108	0,098	0,129	0,136	0,374	0,017
Hostility	0,105	0,277	0,247	0,093	-0,129	0,006	0,340	-0,124	-0,238	0,020	-0,103	-0,278	0,108
Aggressiveness	0,197	-0,320	0,232	-0,162	-0,421	0,302	0,299	0,149	0,164	0,355	0,356	0,099	0,016

Correlation analysis of the connection between terminal, instrumental values and various parameters of aggressiveness among adolescents shows a number of statistically significant relationships: The aggressiveness parameter irritation has a correlation with the instrumental values self-controlled (0.275), responsible (0.325), Independent (-0.280), as well as with the terminal values Freedom (-0.325), True friendship (0.272), in addition, a high indicator of negative correlation with Self-respect (-0.358) and with Wisdom (0.357).

Instrumental Value Intellectual is correlated with three parameters of aggressiveness: Indirect aggression (0.281), negative correlation with suspicion (-0.329), high correlation with guilt (0.374) and Hostility.

The aggressiveness parameter Resentment correlates with instrumental values Obedient (0.304) and Capable (0.290). And verbal aggression has a correlation with Self-controlled (0.275), as well as Salvation are correlated with Guilt (0.318).

Using the method of correlation analysis, a connection between Autoaggression and Hostility was identified with three criteria of values: Intellectual (-0.278), Obedient (0.340) and National security (0.277). As well as personality aggressiveness index - Aggressiveness and six criteria value orientations: Courageous (0.356), Self-controlled (0.355), Obedient (0.299), Obedient (0.299), Self-respect (0.302), Freedom (-0.421), National security (-0.320).



Thus, the results of the study suggest that the value orientations of adolescents determine and have a positive impact on reducing their aggressiveness. Value orientations are a complex socio-psychological phenomenon that is an integral part of a person's system of relationships, determining a person's general approach to the world, to himself, giving meaning to personal positions, behavior, and actions. The system of value orientations expresses the internal basis of the individual's relationship with reality, significantly reducing a number of criteria for his aggressiveness.

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PANORAMIC REVIEW OF MANAGEMENT, CONSERVATIVE TREATMENT AND SHOULDER REDUCTION TECHNIQUES

**Bryam Esteban Coello García¹, Jessica Alexandra Parra Mejía²,
Carolina del Carmen Vélez Andrade³, Geovanna Karolina Cazorla Andrade⁴,
Juan Ignacio Cobos Calle⁵, Lucy Paulette Zumba Ríos⁶,
Darwin Ismael Cajas Peláez⁷, Veronica Yajaira Valencia Cañar⁸**

¹Postgraduate Doctor in Orthopedics and Traumatology at Faculdade de Ciências Médicas Minas Gerais. Belo Horizonte - Brasil.
ORCID <https://orcid.org/0000-0003-2497-0274>

²General Practitioner in Independent Practice, Faculty of Medical Sciences, Universidad Católica de Cuenca. Azuay- Ecuador
ORCID <https://orcid.org/0009-0004-2310-5056>

³General Practitioner at "Clínica Latino", Faculty of Medical Sciences, Universidad de Cuenca. Azuay- Ecuador
ORCID <https://orcid.org/0009-0006-4721-0824>

⁴General Practitioner in Independent Practice, Faculty of Medical Sciences, Universidad de Cuenca. Azuay- Ecuador
ORCID <https://orcid.org/0009-0002-4496-2781>

⁵General Practitioner in Independent Practice, Faculty of Medical Sciences, Universidad de Cuenca. Azuay- Ecuador
ORCID <https://orcid.org/0000-0002-8001-997X>

⁶General Practitioner, Faculty of Medical Sciences, Universidad Católica de Cuenca. Azuay- Ecuador
ORCID <https://orcid.org/0000-0003-1868-4167>

⁷General Practitioner at "HP Drilling Services S.A.S", Faculty of Medical Sciences, Universidad Católica de Cuenca.
Azuay- Ecuador ORCID <https://orcid.org/0009-0000-0985-4510>

⁸General Practitioner at "Cínica traumatológica", Faculty of Medical Sciences, Universidad de Guayaquil. Guayas- Ecuador
ORCID <https://orcid.org/0009-0000-3979-5742>

Corresponding Author: Bryam Esteban Coello García, Address: Rua Tiradentes 266. Campo Belo. Minas Gerais. Brasil, Postal Code: 37270-000

Article DOI: <https://doi.org/10.36713/epra16293>

DOI No: 10.36713/epra16293

ABSTRACT

Introduction: The glenohumeral joint combines a wide range of motion and insufficient bony stabilization, making it susceptible to instability and dislocations. Glenohumeral dislocations are commonly attributed to contact sports, as well as bicycle accidents, falls and high impact trauma.

Objective: to detail current information related to the incidence, clinical evaluation, imaging assessment, management, conservative treatment and shoulder reduction techniques of shoulder dislocations.

Methodology: a total of 30 articles were analyzed in this review, including review and original articles, as well as clinical cases, of which 16 bibliographies were used because the other articles were not relevant for this study. The sources of information were PubMed, Google Scholar and Cochrane; the terms used to search for information in Spanish, Portuguese and English were: shoulder dislocation, glenohumeral dislocation, shoulder reduction maneuvers, shoulder reduction techniques.

Results: The shoulder joint is frequently correlated to dislocations, showing up to 45% of all dislocations. Inferior as well as superior dislocations are rare. Chronic glenohumeral dislocations are infrequent injuries accounting for less than 2%. Anterior glenohumeral dislocations account for about 90% of shoulder dislocations. Approximately 50% to 79% of posterior glenohumeral dislocations are overlooked.

Conclusions: As the epidemiology indicates, there is a high incidence of shoulder dislocations, so it is important to recognize the importance of adequate clinical assessment, diagnosis and knowledge of reduction maneuvers for the management of glenohumeral dislocations. There are several types of maneuvers that can be used for reduction of a dislocated shoulder, these maneuvers can be chosen according to the case of the affected individual, in addition to the preference and experience of the person who is going to perform the reduction maneuver. Imaging tests play an important role both at diagnosis and post-reduction to confirm reduction.

KEY WORDS: shoulder, dislocation, techniques, reduction, conservative.



INTRODUCTION

The glenohumeral joint combines a wide range of motion and insufficient bony stabilization, making it susceptible to instability and dislocations. Glenohumeral dislocations are commonly attributed to contact sports, as well as bicycle accidents, falls, and high-impact trauma. The shoulder joint is frequently correlated with dislocations, accounting for up to 45% of all dislocations. The shoulder joint is the most frequently dislocated joint in the body. Shoulder dislocations are usually anterior. The incidence of glenohumeral dislocation is approximately 17 cases per 100,000 inhabitants per year, being most frequent between 21 and 30 years of age in men and between 61 and 80 years of age in women. Inferior dislocations as well as superior dislocations are rare. Chronic glenohumeral dislocations are infrequent injuries, accounting for less than 2% of all shoulder dislocations. Clinically, most commonly, affected individuals hold the affected arm with the contralateral hand, as well as present with pain on movement and reduced range of motion. Knowledge of the reduction maneuvers or techniques that should be performed in each type of dislocation is of vital importance. There are several reduction maneuvers described over time, in this article we will describe several of them. Reduction maneuvers sometimes require intra-articular lidocaine or intravenous analgesia and sometimes sedation. Conservative treatment usually includes pain management, short-term use of a sling and physiotherapy(1-5).

METHODOLOGY

A total of 30 articles were analyzed in this review, including review and original articles, as well as cases and clinical trials, of which 16 bibliographies were used because the information collected was not important enough to be included in this study. The sources of information were Cochrane, PubMed and Google Scholar; the terms used to search for information in Spanish, Portuguese and English were: shoulder dislocation, glenohumeral dislocation, shoulder reduction maneuvers, shoulder reduction techniques.

The choice of bibliography exposes elements related to shoulder dislocations, incidence, clinical assessment, imaging assessment, management, conservative treatment and shoulder reduction techniques.

DEVELOPMENT

ANTERIOR GLENOHUMERAL DISLOCATION.

Incidence

Anterior glenohumeral dislocations account for about 90% of shoulder dislocations. Traumatic anterior dislocation of the shoulder is much less common in baseball players compared with contact athletes.

Mechanism of Injury

Anterior glenohumeral dislocation can occur following trauma, from direct or indirect forces. It is usually caused by indirect trauma to the upper extremity while the shoulder is in abduction, extension and external rotation.

Clinical Evaluation

The management of a first episode of anterior shoulder dislocation begins with an analysis of the causal mechanism and a physical examination to establish the diagnosis. The affected patient shows great pain, muscle contracture and characteristically presents with the injured arm held in slight abduction and external rotation. A neurovascular evaluation is of great importance, monitoring the integrity of the axillary nerve. Physical examination reveals decreased contour of the shoulder due to relative prominence of the acromion, with a posterior depression located below the acromion and a palpable mass in the anterior shoulder area.

Imaging Evaluation

Trauma series of the injured shoulder:

- Anteroposterior
- Scapular Y.
- Axillary in the plane of the scapula.

Velpeau axillary projection: in case of not being able to perform axillary radiography.

Special projections:

- Hill-Sachs projection.
- West Point axillary projection.
- Stryker's cleft projection.

Computed tomography can demarcate bone lesions of the anterior impeller, free bodies and compression fractures of the glenoid or humeral head. Magnetic Resonance Imaging determines rotator cuff alterations, Bankart lesion and capsular lesions(1,4,6-8).

Conservative Treatment

After a correct clinical evaluation and good analgesic management, closed reduction should be attempted, intra-articular block and/or sedation may also be used. Some of the maneuvers described for the reduction of shoulder dislocations are:

Hippocrates Technique: with this technique reduction is achieved with only one individual, placing one foot on the axillary crease and chest wall and applying axial traction on the upper extremity with slight internal and external rotation.

Milch Technique: with the affected patient in the supine position and the upper extremity in abduction and external rotation, pressure is applied with the thumb to slide the humeral head into place.

Stimson's Technique: after analgesics and/or sedatives are administered, the affected individual is placed in a prone position with the upper extremity hanging freely from the edge of the stretcher. A light manual traction is applied, as well as a 2.5 kg weight can be hung from the wrist, the reduction will take approximately 15 to 20 minutes.

Spaso Technique: the affected patient in the supine position while the examiner holds the wrist or distal forearm and lifts it vertically with gentle vertical traction and external rotation.

Traction-countertraction.



Kocher Maneuver: not recommended because of the high risk of fracture, the head of the humerus is levered over the anterior part of the glenoid to allow reduction. After reduction, treatment includes immobilization for 2 to 5 weeks. A shorter period of immobilization is recommended in the elderly because of possible stiffness, whereas young people with a history of recurrent dislocation may require more time. After immobilization, it is important to perform rehabilitation, progressively improving external rotation, flexion and abduction, as well as exercises to recover range of motion(1,9).

Self-Reduction Technique: called the GONAIIS method (an acronym for "Grasp a waist-high object, Opposite arm assists, Nonsedated, Autoreduction/autotraction, Immobilize the grasped object, and Squatting and stooping"). To perform the technique, an immobilized object is grasped at waist level. The affected individual may bend backward, stand on tiptoe, or bend the ipsilateral elbow while grasping the object. Mild traction is exerted on the affected arm and gradually pulled back and bent to flex forward and abduct the dislocated shoulder. The involved arm is essentially placed in the scapular plane for the duration of the self-reduction. When the angle of the trunk and engaged arms becomes between 90°, the affected individual begins to squat. The angle should remain at 90° and traction on the involved arm should be maintained throughout the entire time of squatting. After squatting fully, the affected individual bends down and steps back a few steps while remaining in the same position. When the dislocated humerus is not successfully reduced after holding the affected arm in the zero position, the affected person should use the opposite hand to exert pressure to push the humerus back and reduce the dislocation(10,11).

External Rotation Technique: the affected arm is abducted to the chest wall, the elbow flexed at 90°, the shoulder flexed at 20°, grasping the wrist of the affected individual with one hand and securing the elbow with the other hand, the arm was rotated externally, slowly and gently until the forearm is in the coronal plane. No traction is used in the maneuver. After reduction, the arm is internally rotated to bring the forearm to the chest(11,12).

Fee Technique: With the affected individual in the supine position with the upper extremity at his or her side, the examiner secures the affected individual's wrist and gently pulls on the arm to provide traction. The arm is abducted while gradually moving back and forth in small rocking motions (about 10 cm).

Fulcrum Technique: the affected individual in the supine or sitting position and a rolled towel or sheet is placed in the axilla. The distal humerus is adducted with simultaneous posterolateral force on the humeral head. It requires greater force and therefore tends to show greater complications.

Cunningham Technique: with the affected individual seated with the examiner also seated in front of the patient. The affected individual places the ipsilateral hand on the examiner's shoulder. The physician rests one arm in the crease of the affected individual's elbow and uses the other hand to massage the patient's biceps, deltoid and trapezius muscles. After the patient relaxes, he/she is asked to bring the shoulder blades together and straighten the back(13).

Scapular manipulation technique: prone patient with the shoulder flexed 90° and his arm hanging in external rotation. Downward traction is exerted by hanging weights on the patient's wrist or by exerting traction. The physician then pushes the inferior tip of the scapula by rotating it medially upward(11,14).

Figure 1. Anteroposterior view radiographs of the right shoulder of a skeletally mature individual, the image on the left shows a glenohumeral dislocation, the image on the right shows the same individual after closed reduction.



Source: The Authors.



Contraindications

- Humeral neck fractures may cause avascular necrosis.
- Subclavicular and/or intrathoracic dislocations include a subacute dislocation in an elderly individual and an associated surgical neck fracture.
- Avoid multiple attempts in injuries that include neurovascular involvement (including musculocutaneous nerve, brachial plexus involvement, axillary nerve, etc.). If rapid reduction cannot be accomplished without further injury, surgery may be required.
- Suspected arterial injury may require urgent angiography in the first instance(13).

POSTERIOR GLENOHUMERAL DISLOCATION

Occurrence

The glenohumeral joint is the most commonly dislocated joint, however, due to the lower prevalence of posterior shoulder dislocations, about 50% to 79% of posterior glenohumeral dislocations go unnoticed at initial presentation. This type of dislocation is shown in approximately 10% of shoulder dislocations and 2% of all shoulder injuries. Recurrent posterior dislocations are shown in 30% of affected individuals and predispose the joint to degenerative changes.

Mechanism of Injury

Indirect trauma: it is the most common. The shoulder is positioned in a particular way, in adduction, flexion and internal rotation. A posterior dislocation may occur secondary to an electric shock or during a seizure due to the greater muscular force applied by the internal rotators, particularly the pectoralis major, latissimus dorsi and subscapularis.

Direct trauma: is the consequence of applying a direct force to the anterior area of the shoulder, giving rise to a posterior translation of the head of the humerus.

Clinical Assessment

In the evaluation of posterior glenohumeral dislocation, a very notable deformity is not usually visualized, because the injured upper extremity is maintained in the sling position, or rather, with the shoulder in internal rotation and adduction. Sometimes these injuries are often overlooked in case a total radiographic series is not performed. A thorough neurovascular evaluation should be done in order to rule out circumflex nerve injury, although this is rare compared to anterior glenohumeral dislocation. On evaluation, limitation of external rotation usually to 0° and shoulder antepulsion usually to 90° may be seen. Flattening of the anterior area, palpable protrusion in the posterior region of the shoulder and prominence of the coracoid process may be seen(1,4,15).

Imaging Evaluation

Traumatologic series of the injured shoulder:

- Anteroposterior
- Scapular Y.

- Axillary.

An axillary Velpeau projection is sometimes indicated when the patient is unable to position the shoulder for a standard axillary projection.

On the standard anteroposterior view, features suggestive of a posterior glenohumeral dislocation are:

- Sinker sign: impacted fracture of the anterior part of the humeral head on impact with the posterior glenoid rim.
- Empty glenoid sign: the glenoid cavity is partially empty with a gap between the anterior rim and the humeral head > 6 mm.
- Existence of a gap in the superior/inferior glenoid cavity.
- Absence of the normal elliptical overlap of the humeral head over the glenoid.
- Loss of the contour of the neck of the humerus.

Glenohumeral dislocation is best assessed in the axillary projection; CT scan allows us to evaluate the percentage of the humeral head affected in an impacted fracture(1,4,6,9).

Conservative Treatment

Closed reduction requires complete muscle relaxation, sedation and analgesia. Pain in posterior glenohumeral dislocation after acute trauma is usually more intense compared to anterior dislocations, so anesthesia may be required for reduction. With the individual in the supine position, traction is applied to the adducted arm in line with the deformity, raising the head of the humerus slightly toward the glenoid socket. External rotation of the shoulder should not be forced, as it may cause a fracture of the humeral head if it presents an impacted fracture locked over the posterior glenoid rim, if radiographs show this type of fracture, in addition to axial traction should be applied lateral traction on the limb allowing unlocking the head of the humerus. Subsequently a sling with rotation locking should be placed if the shoulder is stable, in case of subluxation or new dislocation, a shoulder cast with a degree of external rotation can be placed to allow the greatest stability. These immobilizations should be kept for 3 to 6 weeks. While the individual is immobilized, isometric external rotation and deltoid exercises can be performed. After removal of the immobilization, an intense program of strengthening of the internal and external rotators should be performed(1,4,9).

In other words, closed reduction is obtained with in-line traction on the affected arm, which is internally rotated and adducted. Traction together with gentle, anteriorly directed manipulation of the humeral head allows it to be guided into the glenoid groove. Contraction can be exerted with a sheet wrapped around the affected axilla. Forced external rotation should be avoided, as this may cause excessive tension on the proximal humerus and result in fractures. Successful reduction is evident when a "thump" is felt as the joint is reduced, pain improves, normal anatomy returns and range of motion allows the affected person to place the palm of the injured arm on the opposite shoulder(11,16).

Another maneuver described is with the affected person in the supine position, an assistant applies anterior pressure to the



humeral head while the examiner applies axial traction to the humerus with internal and external rotation of the humerus(13).

Figure 2. Anteroposterior view radiographs of the right shoulder of a skeletally mature patient, the image on the left shows a dislocated shoulder, the image on the right shows the same patient after closed reduction.



Source: The Authors

Contraindications

- Late presentation to the emergency department (more than 6 weeks).
- Multipart or displaced fractures/dislocations(13).

INFERIOR GLENOHUMERAL DISLOCATION (ERECT DISLOCATION)

A rare disorder, with the most affected population being the elderly. Inferior dislocations of the shoulder have an incidence of approximately 1 in 200 of all dislocations. The diagnosis can usually be made from the door.

Mechanism of Injury

Frequently caused by a hyperabduction force that gives an entrapment of the neck of the humerus over the acromion, levering the head of the humerus and heading in an inferior direction. The superior portion of the articular area is directed inferiorly, without rubbing against the inferior glenoid rim. The diaphysis of the humerus is directed upward. Avulsion and rotator cuff tears, axillary artery injury, pectoralis pectoris injury, brachial plexus injury and fracture of the proximal humerus are common.

Clinical Assessment

Affected individuals commonly present with pain and a saluting position, evidencing a locked humerus in 110° to 160° of abduction and antepulsion. The head of the humerus is usually palpated over the lateral aspect of the thorax in the axilla. It is essential to perform a meticulous neurovascular examination due to the presence of related neurovascular lesions that can complicate this type of dislocation.

Imaging Evaluation

Traumatologic series of the injured shoulder:

- Anteroposterior
- Scapular Y.
- Axillary.

Traditionally the anteroposterior projection gives the diagnosis by showing the inferior dislocation of the humeral head, with the diaphysis of the humerus directed superiorly along the glenoid margin. It is necessary to carefully evaluate the radiographs looking for associated fractures, which are frequent and complex to appreciate by the clinic because of the generalized pain in the shoulder(1,4,8,14).

Conservative Treatment

Reduction is commonly obtained by means of traction-countertraction maneuvers, although it is usually painful. Axial traction is performed by guiding the bony humerus axis in a superolateral direction, gradually decreasing the degree of abduction of the shoulder. Countertraction is applied by placing a sheet around the affected person and applying force in the same direction, but in the opposite direction to the traction vector. The shoulder must be immobilized with a sling for 3 to 6 weeks, depending on the age range of the individual; older individuals need less time to reduce possible shoulder stiffness(1,9).

Contraindications.

- Fractures of the humeral neck or diaphysis should be performed in a surgical setting.
- Any potential for vascular injury(13).



Figure 3. Scapular profile radiographs of the right shoulder of a skeletally mature individual, the image on the left shows a dislocated shoulder, the image on the right shows the same patient after a closed reduction.



Source: The Authors.

UPPER GLENOHUMERAL DISLOCATION

It is an unusual injury, even more difficult to find compared to inferior glenohumeral dislocation.

Mechanism of Injury

When an extreme force is applied in an anterior and superior direction produced directly by the limb being in adduction, as in the fall from a certain height on the upper limb, so that the head of the humerus is directed superiorly from the glenoid cavity. These are related to some fractures such as those of the clavicle, trochlea, trochanter, trochlea as well as the coracoid process and injuries of the acromioclavicular joint. In addition, they are shown with soft tissue alterations such as biceps tendon, rotator cuff, glenohumeral capsule and musculature.

Clinical Assessment

The affected individual commonly arrives securing the upper extremity in adduction, which is shortened. Examination reveals a palpable humeral head above the acromion. Neurovascular lesions are common and should be ruled out in any case.

Imaging Evaluation

Traumatologic series of the affected shoulder consisting of projections:

- Anteroposterior clarifies the diagnosis by showing dislocation of the humeral head above the acromion.
- Scapular Y.
- Axillary.

Radiographs should be evaluated meticulously to rule out associated fractures, which are common and may not be detected on examination because of generalized shoulder pain.

Treatment

Closed reduction should be attempted with analgesics and sedatives, allowing for better reduction; axial traction in the inferior direction with countertraction may be applied along with a lateral traction component. As with inferior dislocations, soft tissue injuries and associated fractures are common; an irreducible dislocation may require open reduction(1,4,11).

Post-Reduction Considerations

- The individual should be placed in a sling.
- Perform a new neurovascular examination.
- Perform post-reduction imaging.
- Follow up with an orthopedist(13).

CONCLUSIONS

As the epidemiology indicates, there is a high incidence of shoulder dislocations, so it is important to recognize the importance of adequate clinical assessment, diagnosis and knowledge of reduction maneuvers for the management of glenohumeral dislocations. There are several types of maneuvers that can be used for reduction of a dislocated shoulder, these maneuvers can be chosen according to the case of the affected individual, in addition to the preference and experience of the person who is going to perform the reduction maneuver. Imaging tests play an important role both at diagnosis and post-reduction to confirm reduction.

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Conflict of Interest Statement

The authors report no conflicts of interest.

Financing

The authors do not report funding from any organization or company.



ORGANIZATIONAL COMMITMENT: BOOSTING INNOVATION THROUGH KNOWLEDGE SHARING

Anastasia M D Batmomolin, Justine Tanuwijaya, Bahtiar Usman
Faculty of Economics and Business, Universitas Trisakti, Indonesia

Article DOI: <https://doi.org/10.36713/epra16274>
DOI No: 10.36713/epra16274

ABSTRACT

Employee innovative behavior is crucial in an era characterized by rapid change and intense competition. This research aims to investigate the influence of organizational commitment on teacher innovative work behavior, mediated by knowledge sharing. A total of 191 teachers from several prestigious private schools in Jakarta, Indonesia, agreed to participate as respondents by completing an online questionnaire. The analysis employed Structural Equation Modeling (SEM) with SMART Partial Least Squares (SMARTPLS). The results indicate that affective and continuance commitment significantly influence teacher innovative behavior both directly and through the mediating role of knowledge sharing. However, normative commitment was not found to have a significant influence on innovative behavior. These findings are expected to provide valuable insights for the development of human resource management strategies in the education context and contribute significantly to the enhancement of overall education quality.

KEYWORDS: innovative work behavior, knowledge sharing, organizational commitment, teacher

INTRODUCTION

Education serves as the cornerstone of building an advanced and sustainable society. Teachers, as primary agents in the learning process, play a crucial role in ensuring the quality and relevance of education for future generations. As education faces evolving challenges, the innovative work behavior of teachers becomes increasingly important. Innovative teachers can adapt to changes by creating new teaching methods, utilizing the latest technology, and adopting approaches that are relevant to students' needs. According to Dalima et al. (2023), the demands of society and industry for quality human resources and rapid social change mean that educational institutions are always in dynamics. This is necessary to meet the expectations of the younger generation who are competent in the fields of knowledge, skills and virtuous character.

Previous studies have concluded that innovative work behavior within organizations is not only a product of individual talents and traits but also results from social and psychological influences (Khaola & Coldwell, 2019) such as commitment and willingness to share. Organizational commitment has been recognized as a crucial factor influencing employee work behavior (Hakimian et al., 2016) which contributes to the success of organizational change (Mações & Román-Portas, 2022). Teacher commitment determines school success because it is related to creating a conducive learning environment, supporting positive behavior, and ongoing guidance. Teachers' level of commitment to the organization has the potential to influence their engagement in innovative practices. However, the influence of organizational

commitment on teachers' innovative work behavior still requires deeper understanding.

In an era where information and knowledge are easily accessible, the concept of knowledge sharing becomes increasingly significant. Knowledge sharing enables teachers to access new ideas, best practices, and relevant knowledge to enrich the learning experience and service provision. According to Alblooshi et al. (2020), it is important for organizations to encourage, foster, and support organizational learning, and knowledge sharing should be embraced by every individual within the organization. Phung et al. (2017) stated that knowledge is a crucial resource for organizations to develop competitive advantages, especially in complex environments. Knowledge plays a role in enhancing intellectual capital by promoting the exchange and creation of knowledge within the organization.

This paper aims to explore the influence of organizational commitment on teachers' innovative work behavior, considering the role of knowledge sharing as a mediator. By understanding these dynamics, it is hoped to gain a deeper understanding of how organizational commitment affects teachers' innovative behavior through the process of knowledge sharing. Knowledge sharing as a mediating variable is an innovation that has not been previously undertaken by researchers, especially in the field of education.



LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Organizational Commitment

Organizational commitment yields benefits for both employees and organizations (Phetsombat & Na-Nan, 2023). Commitment relates to employees' mental and emotional engagement with the organization, influenced by how employees identify themselves, engage in organizational activities, and feel valued as members of the organization (Maiti et al., 2021). Organizational commitment refers to the extent to which an employee feels bound to or identifies with the organization they work for. This encompasses the employee's desire to remain a part of the organization. Emotional attachment to the organization and belief in its values are considered primary indicators of employee commitment (Robbins & Judge, 2022). Meyer & Allen (1991) developed organizational commitment as a multidimensional construct consisting of affective commitment (AC), normative commitment (NC), and continuance commitment (CC). These three dimensions represent psychological states that describe the relationship between employees and the organization, impacting employees' decisions to continue or terminate their membership in the organization. Affective commitment is developed when there is a mutually beneficial exchange-based relationship between employees and the organization, as employees who are affectively committed feel a sense of ownership and connection to the workplace and the organization (Abbasi et al., 2022). Continuance commitment relates to an employee's choice to remain employed in a company based on cost-benefit calculations. Normative commitment reflects a sense of obligation to continue the job. Employees with high levels of normative commitment feel they ought to stay with the organization (Meyer & Allen, 1991). Employees experiencing all three forms of commitment will demonstrate a strong desire to remain within the organization (Noesgaard & Jørgensen, 2023).

Knowledge Sharing

Motivating people to share knowledge within an organization is one of the most important priorities for knowledge management practitioners (Salehi et al., 2023). Knowledge sharing is a form of high-level donation involving sacrifice, where individuals willingly make their knowledge available to be understood, adopted, and utilized by others. This, in turn, can result in shared ownership of knowledge (Nham et al., 2020), mutual understanding, and new wisdom (Rattanawichai et al., 2022). Knowledge sharing holds significant value for organizations as it can enhance efficiency, prevent waste, reduce training costs, and minimize risks (Nguyen et al., 2019). It also contributes to the development of employee and organizational capabilities (Siri & Lorsuwannarat, 2020) and enhances innovation performance (Iqbal et al., 2023). Organizations that can effectively or sustainably share knowledge possessed by employees will continue to access new knowledge, opening opportunities to gain sustainable competitive advantages (Israilidis et al., 2020). Sharing knowledge in today's competitive environment will aid in the growth of skills and abilities of staff and managers (Salehi &

Alanbari, 2023). Knowledge sharing serves as an informal learning source that assists teachers in preparing and planning teaching programs and enhancing teaching practices (Langdal, 2023).

Innovative Work Behavior

Innovative behavior is the ability of employees to discover innovative solutions to problems through new thinking processes while making additional efforts to enhance long-term performance, create advantages, and effectiveness (Javed et al., 2021). Creative and innovative behavior is necessary to generate fresh and applicable ideas that can enhance organizational efficiency (Shafaei & Nejati, 2023). Employee innovation encompasses changes in beliefs and behaviors of individuals working within the organization (Neck et al., 2017). The use of innovative methods or approaches can enable employees to enhance performance with better outcomes through more efficient means (Nasir et al., 2018). Innovation activities require the ability to think and do things differently (Battistelli et al., 2019). Such behavior not only generates new ideas but also promotes and realizes innovative ideas (Stoffers et al., 2020). Innovative behavior requires motivational triggers and intrinsic identification by employees, enabling this behavior to be sustained when facing challenges (Wu & Wu, 2019).

Organizational Commitment and Innovative Work Behavior (IWB)

Organizational commitment is a strong belief in the values and goals of the organization, a desire to continue working with the organization, and a willingness to contribute to the organization's development (Nguyen & McGuirk, 2022). Affective commitment drives employees to better understand and embrace the values and goals of the organization, and to strive for the organization's aspirations to be achieved through new and innovative ways (Hakimian et al., 2016). Previous research findings have concluded that there was inconsistency in the influence of organizational commitment dimensions on innovative work behavior. Studies by Azinga et al. (2023) and Tajeddini et al. (2023) showed that affective commitment enhanced employees' innovative work behavior in the healthcare, textile, and SME sectors. However, in public organizations, affective commitment among civil servants did not promote innovative behavior (Batmomolin et al., 2022). On the other hand, normative commitment also significantly impacts employees' innovative work behavior (Hakimian et al., 2016). Normative commitment is defined as employees' belief in their moral obligation to remain with the organization. This obligation drives employees to strive harder in performing their tasks and also encourages them to seek solutions to enhance performance and generate innovative work behavior. Employees with high levels of normative commitment will exert themselves because they believe that such efforts are right and moral. Therefore, normative commitment, rooted in morality, encourages employees to be innovative and share new ideas within the organization (Hakimian et al., 2016).

H1a Affective Commitment (AC) has a positive effect on IWB



H1b Continuance Commitment (CC) has a positive effect on IWB

H1c Normative commitment (NC) has a positive effect on IWB

Organizational Commitment and Knowledge Sharing (KS)

Knowledge sharing depends on the relationships and interactions of individual employees (Ngee Ng, 2022). The findings of Sharif et al. (2022) indicated that library employees in Pakistan are more inclined to require trust from their coworkers to share tacit knowledge with others under female leadership compared to male leadership, and under male leadership, library employees engaged in more tacit knowledge sharing practices when they are emotionally committed to the organization. Affective and normative commitment significantly influenced employees' knowledge sharing intention. Continuance commitment did not affect knowledge sharing intention. Additionally, there was a positive reciprocal influence between affective and normative commitment contributing to knowledge (Luo et al., 2021). Ouakouak & Ouedraogo (2019) reported that organizational commitment influenced employees' willingness to give and receive knowledge as part of a sharing culture. Employees with affective commitment contributed to improving the level of knowledge management maturity in pursuing organizational goals (Marques et al., 2019).

H2a AC has a positive effect on KS

H2b CC has a positive effect on KS

H2c NC has a positive effect on KS

Knowledge Sharing and Innovative Work Behavior

Knowledge sharing is a social asset that can influence the future success of organizations, where sharing knowledge enables organizations to operate effectively and efficiently (Ye et al.,

2022). When employees engage in knowledge sharing, they collaborate and learn together, thereby opening opportunities for them to generate innovative ideas (Perotti et al., 2022; Muhammed et al., 2020). Employees with greater knowledge are more likely to share it with their colleagues. This behavior recurs, as employees who receive knowledge will reciprocate it in various forms, ultimately providing opportunities for employees to exhibit innovative behaviors (Jabid et al., 2023). One characteristic of innovation is value creation, made possible through knowledge exchange (Salehi & Alanbari, 2023).

H3 KS has a positive effect on IWB

Knowledge Sharing as Mediator

Knowledge sharing is crucial for externalizing individual knowledge within an organization, ensuring that employees in need of that knowledge can effectively carry out their job tasks (Lee et al., 2023). In complex contexts like today's, knowledge sharing is a primary mechanism for designing collaborative solutions tailored to address environmental needs (Castaneda & Cuellar, 2021). According to Ahmed et al. (2018), knowledge sharing plays a significant role in intervening in employees' ingrained commitment with innovative work behavior. Shared knowledge and skills enable employees to integrate and cultivate new knowledge and ideas. Thinking processes and work methods can be enhanced, thereby boosting employees' knowledge levels and work capabilities and influencing organizational innovation performance. Therefore, employees' knowledge sharing behavior can positively impact organizational innovation performance (Zhao et al., 2020).

H4a KS mediates the influence of AC on IWB

H4b KS mediates the influence of CC on IWB

H4c KS mediates the influence of NC on IWB

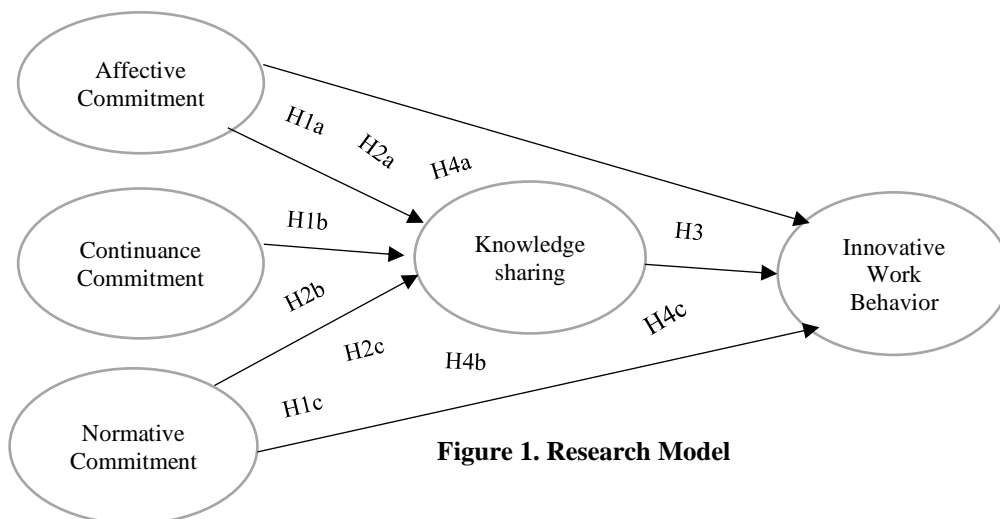


Figure 1. Research Model

METHODOLOGY

This study is causal research aimed at testing hypotheses by analyzing the influence between research variables. The approach used is a quantitative approach, which examines the influence of organizational commitment on innovative work

behavior mediated by knowledge sharing. Data collection is cross-sectional or one-shot, meaning data is collected at a single point in time, specifically in July 2023, while the unit of analysis is 191 individual teachers distributed across seven private high schools in the capital city of Jakarta, Indonesia.



Measurement of organizational commitment utilizes twenty-four statement items developed by Allen & Meyer (1990), comprising 8 statements each for affective commitment, continuance commitment, and normative commitment. To measure innovative work behavior, nine items adopted from Janssen (2000) are employed. Eight statement items adopted from De Vries et al., (2006) are used to measure knowledge sharing. All items in the research instrument employ a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

RESULTS AND DISCUSSION

Characteristics of Respondents and Descriptive Statistics

The majority of respondents are female teachers (54.4%), aged over 50 years (35.2%), have a bachelor's degree as their highest education level (79.7%), and have been working for more than 20 years in the same school (31.8%).

The mean for the affective commitment variable is 4.44. This indicates that employees have an emotional attachment and are happy to spend their lives and energy for the school. Employees also enjoy talking about their school to others. Employees feel part of the school. The school is very meaningful to the employees, and school issues are the teachers' concerns. The mean for continuance commitment is 4.21, indicating that employees strongly desire to continue working at the current school until retirement age. There is a fear within the employees of leaving the school, and their lives would be disrupted if they were to switch to another school or job. There are losses to be incurred if they were to leave this school. The average for normative commitment is 4.16. This means that employees are loyal, faithful, and unwilling to move even if there are better offers at other schools. Loyalty is a fundamental attitude of the employees, and they want to continue working at the current school out of a sense of moral obligation.

The mean for knowledge sharing is 4.08, indicating that knowledge sharing is practiced among the teachers. Teachers are willing and eager to accept and share information,

knowledge, and skills. There is an exchange of knowledge among fellow teachers to enrich and help each other for the progress and development of the school. There is a relationship and collaboration created among the teachers in ensuring the availability of knowledge needed for student learning, teacher career development, and service to customers.

The average for innovative work behavior is 3.94, meaning that teachers feel they have exhibited innovative work behavior. Teachers strive to create ideas, seek methods, techniques, or instruments, and generate solutions to the problems they face. Teachers who have ideas are able to garner support from colleagues to implement the ideas generated. Teachers are also able to transform creative ideas into good practices that can be shared with colleagues and students.

Measurement Model

The measurement model reflects all variables while considering outer loadings, Cronbach's alpha, composite reliability (CR), and Average Variance Extracted (AVE). An instrument is categorized as valid based on the value of factor loading. In this case, referring to Hair et al. (2019), if the sample size is 150, then a factor loading of 0.45 is considered valid, and if the sample size is 200, then a factor loading of 0.40 is considered valid. With a sample size of 191 respondents, a minimum factor loading of 0.40 is considered valid. The data in table 1 show that the factor loading values range from 0.458 to 0.793, indicating that all items are valid reflections of variable measurements.

Similarly, an instrument is considered reliable if the Cronbach's alpha and composite reliability values are ≥ 0.60 , as per the guidelines of Hair et al. (2019). The data in table 1 indicate that the Cronbach's alpha and composite reliability are above 0.60, indicating that all statement items are reliable as instruments. Meanwhile, an AVE value above 0.50 reflects that the indicators represent the measured constructs.

Table 1. Outer Loadings, Cronbach's Alpha, CR and AVE

Variable	Items	Outer Loadings	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Affective Commitment	AC1	.651	.826	.869	.663
	AC2	.458			
	AC3	.700			
	AC4	.616			
	AC5	.732			
	AC6	.739			
	AC7	.766			
	AC8	.785			
Continuance Commitment	CC1	.668	.811	.858	.634
	CC2	.770			
	CC3	.660			
	CC4	.754			
	CC5	.680			
	CC6	.618			



	CC7	.525			
	CC8	.560			
Normative Commitment	NC1	.583	.733	.834	.688
	NC2	.668			
	NC3	.592			
	NC4	.655			
	NC5	.575			
	NC6	.682			
	NC7	.644			
	NC8	.571			
Knowledge Sharing	KS1	.722	.851	.884	.849
	KS2	.759			
	KS3	.719			
	KS4	.629			
	KS5	.750			
	KS6	.693			
	KS7	.620			
	KS8	.686			
Innovative Work Behavior	IWB1	.637	.890	.911	.734
	IWB2	.683			
	IWB3	.670			
	IWB4	.762			
	IWB5	.761			
	IWB6	.763			
	IWB7	.793			
	IWB8	.729			
	IWB9	.760			

Source: Data is processed with SmartPLS

Hypothesis Testing

The results of hypothesis testing are presented in table 2. The data in the table 2 indicates that out of the ten hypotheses

proposed, seven of them are accepted, and three are rejected. Hypotheses are accepted if the p-value is < 0.05 and rejected if the p-value is > 0.05.

Table 2. Hypothesis Testing Results

Hypothesis	Path Coefficient	T-Values	P-Values	Decision
AC → IWB	.206	2.579	.010	Supported
CC → IWB	.197	2.343	.020	Supported
NC → IWB	.128	1.295	.196	Not Supported
AC → KS	.263	3.121	.002	Supported
CC → KS	.327	4.014	.000	Supported
NC → KS	.141	1.538	.125	Not Supported
KS → IWB	.207	2.752	.006	Supported
AC → KS → IWB	.055	1.983	.048	Supported
CC → KS → IWB	.068	2.182	.030	Supported
NC → KS → IWB	.029	1.340	.258	Not Supported

Source: Data is processed with SmartPLS

DISCUSSION

The statistical testing results indicate that high affective commitment fosters innovative work behavior. H1a is supported. This finding reaffirms studies by Hakimian et al. (2016); Ouakouak & Ouedraogo (2019); Azinga et al. (2023); Tajeddini et al. (2023). The emotional connection teachers have towards their job and work environment can motivate them to engage in innovative activities, especially in seeking new ways to enhance student learning experiences and parent engagement. Teachers are more willing to try new teaching methods or utilize new technologies to support learning and are

open to new ideas, actively seeking innovative solutions to challenges they face. Affective commitment can help build an innovative culture in schools, fostering experimentation and positive change.

Continuance commitment contributes positively to the level of innovation in work behavior. H1b is supported. This result contrasts with previous research conducted by Ouakouak & Ouedraogo (2019) but is consistent with Hakimian et al. (2016). Individuals who feel continuously committed to the organization tend to stay and invest in the organization. In other



words, employees perceive that they must remain in the organization because of the needs or dependencies they have built. This continued attachment may lead to greater efforts by individuals to create added value for the organization, including through innovative work behavior. Individuals who feel continuously committed may feel more secure in taking risks, proposing new ideas, and trying different approaches in their work because they believe that their investment in the organization will bring long-term benefits. Additionally, individuals who feel continuously committed are more likely to seek new ways to improve their own performance and that of the organization as a whole, including through innovation. Employees may be more motivated to face new challenges and opportunities because they see the organization as an integral part of their identity and long-term future. Thus, continuous commitment can be a key driver of innovative work behavior, as it enhances motivation, courage to take risks, and focus on creating added value for the organization.

Normative commitment does not influence innovative work behavior. H1c is not supported. This result is consistent with Marques et al. (2019) that normative commitment does not affect knowledge transfer. It may be because employees feel they have to continue working solely out of moral obligation or adherence to social norms. This moral responsibility gives rise to commitment and loyalty to strive to remain in the organization. Loyalty to the organization may foster comfort without developing innovative aspects that may require taking risks or significant change.

The research findings conclude that strong affective commitment positively influences knowledge sharing. H2a is supported. This result is consistent with the studies by Hakimian et al. (2016); Ouakouak & Ouedraogo (2019); and Sharif et al. (2022). Teachers with high affective commitment to their job tend to feel more attached to the organization. They foster a sense of ownership towards the school and form stronger interpersonal relationships with colleagues. A strong sense of ownership enables teachers to be more willing to collaborate and share knowledge with coworkers as a positive contribution to collective efforts and organizational success. Strong interpersonal relationships with coworkers can enhance trust and support, making teachers more comfortable in sharing knowledge, experiences, and best practices. This knowledge-sharing process can broaden insights, sharpen skills, and enhance overall teaching effectiveness.

High continuance commitment has a positive impact on knowledge sharing. H2b is supported. This result is consistent with the study by Ouakouak & Ouedraogo (2019). Continuance commitment is related to individual involvement based on the needs or dependencies created by the individual's investment in the organization, such as time, effort, and experience. Innovative work behavior tends to be more related to individuals' ability to think creatively, generate new ideas, and change existing work methods to create added value for the organization. Therefore, commitments more closely related to direct involvement in the organization, such as continuance

commitment, are more likely to influence innovative work behavior by encouraging individuals to invest more time, energy, and resources into creating change and innovation. Normative commitment does not influence knowledge sharing. H2c is not supported. A teacher's attachment to the school due to moral obligation is not sufficient to encourage teachers to be generous in sharing. Although normative commitment can be an important factor in the relationship between individuals and organizations, the generosity of sharing knowledge is often driven by intrinsic motivation, personal satisfaction in helping colleagues, or perceptions of the benefits of sharing actions.

Knowledge sharing has a positive influence on innovative work behavior. H3 is supported. This finding is consistent with previous studies conducted by Munir & Beh (2019); Vandavasi et al. (2020); Islam et al. (2022). The practice of knowledge sharing creates an environment where organizational learning can thrive. When knowledge and experiences are widely shared among members of the organization, it opens the door to enhanced collaboration, innovation, and adaptation to change. Collaboration and interaction among individuals through the knowledge-sharing process can generate more creative ideas and innovative solutions. Through discussions, exchange of ideas, and open thinking, individuals can combine their knowledge and experiences to produce better solutions than what can be achieved individually. When individuals feel that their knowledge and ideas are valued and appreciated by their peers, it can boost their confidence and motivation to actively contribute to the innovation process. Feeling noticed and supported, individuals are more motivated to create and experiment with new ideas, even if it involves risk or failure.

Knowledge sharing mediates the influence of affective commitment on innovative work behavior. H4a is supported. This finding confirms previous research on SME employees in Bali conducted by Arsawan et al. (2022). Affective commitment can motivate individuals to share knowledge with their colleagues. Through this practice of knowledge sharing, teachers can disseminate ideas, experiences, and resources that can trigger innovation in the workplace. Through knowledge sharing, teachers can access new knowledge, alternative perspectives, and creative ideas from their peers. This can enhance their problem-solving abilities, develop new solutions, and adopt innovative work behaviors. Teachers who feel emotionally committed to their job, actively share knowledge with coworkers, and have a willingness to try new things are more likely to demonstrate innovative work behavior.

Knowledge sharing plays a role as a mediator between continuance commitment and innovative work behavior. H4b is supported. The exchange of knowledge and information between teachers is an effective means for loyal and committed teachers to foster creativity and innovation in schools. When sharing knowledge, teachers who have a high level of affection for the school will gain new ideas and strive to implement them to improve the quality of classroom learning and provide excellent service to students. By sharing knowledge, experience, information, and ideas among teachers, individuals



will feel more bound and morally engaged in the school. Commitment to being bound and engaged in the school will motivate teachers to contribute to creating change in the school by daring to take risks and develop new ideas that support innovation. According to Azizi et al. (2023), to achieve the appropriate level of knowledge creation and innovation, organizations must selectively promote the knowledge and skills of their employees. This process requires the crucial role of knowledge sharing within an organization. If motivated, employees can become more efficient and produce better outputs in knowledge creation in a shorter amount of time.

Knowledge sharing is unable to mediate the influence of normative commitment on innovative work behavior. H4c is not supported. When individuals have high normative commitment, they may be more inclined to comply with existing social norms and expectations rather than thinking creatively or taking risks to effect change. In this case, normative commitment may not directly support innovative work behavior because its focus is more on maintaining the status quo and loyalty to the organization without considering innovative aspects that may require risk-taking or significant changes. Therefore, knowledge sharing, which refers to the exchange and dissemination of knowledge within the organization, may not be sufficient to mediate the influence of normative commitment on innovative work behavior. Although knowledge sharing can enhance individuals' access to new information, ideas, and other intellectual resources, individuals with high normative commitment may still be reluctant to take risks or try new approaches in their work due to their adherence to existing norms. As a result, knowledge sharing may not effectively facilitate the relationship between normative commitment and innovative work behavior.

CONCLUSION

Innovative work behavior of teachers is influenced by organizational commitment. Specifically, affective and continuance commitment affect teachers' innovative behavior both directly and through the mediating role of knowledge sharing. Meanwhile, normative commitment does not have a significant influence either directly or indirectly on innovative behavior. This study contributes to human resource development in the field of education.

Several implications of this research for school management are as follows: Firstly, school management can direct efforts to enhance affective and continuance commitment among teachers. This can be done through various means, such as creating a supportive work climate and addressing the emotional needs of teachers; organizing training and self-development programs aimed at increasing teachers' attachment and involvement with the school; and establishing incentive and reward systems that encourage long-term commitment of teachers to the school. Secondly, school management needs to identify and encourage knowledge sharing practices among teaching staff. This can be achieved through: establishing learning communities among teachers to share experiences and knowledge, implementing online

platforms or forums that facilitate teachers to share ideas, best practices, and educational resources, and providing rewards and recognition to teachers who are actively engaged in sharing knowledge and experiences with their colleagues. Thirdly, school management needs to develop policies and procedures that support innovation in the school environment by allocating sufficient time and resources for research, curriculum development, granting teachers the freedom to experiment with new teaching methods, building partnerships with educational institutions, industries, and the local community to support innovation and sustainable learning.

As for the limitations of this research, it was only conducted in a few select schools in Jakarta, Indonesia. Further research could be conducted in other institutions and cultures to gain a deeper understanding of the relationships between variables across different cultures. Future research could utilize other social and psychological factors as mediating variables, such as organizational support, resilience, and self-efficacy.

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INCLUSIVE MATHEMATICS CLASSROOM PRACTICES FOR CHILDREN WITH DIVERSE LEARNING NEEDS FROM THE PERSPECTIVE OF COGNITIVE LOAD THEORY

Trisha Banerjee¹, Dr. Manish Kumar Gautam²

¹ICSSR Doctoral Fellow, UGC SJSJC Fellow, Department of Teacher Education, School of Education, Central University of South Bihar, Gaya, Bihar

²Assistant Professor, Department of Education, University of Allahabad, Prayagraj, Uttar Pradesh

Article DOI: <https://doi.org/10.36713/epra16279>

DOI No: 10.36713/epra16279

ABSTRACT

Inclusion is a right, not a special privilege. The Indian Constitutions Article 21A recognizes education as a right, for all children. The concept of inclusive education rests on the belief that every child has the ability to learn and reach their potential when given a chance to participate in school provided with necessary resources and taught in a way that suits their individual needs (Handbook of Inclusive Education, p.13). Various educational policies, programs, acts and laws. From the Kothari Commission to the National Policy on Education 1968 Integrated Education for children (IEDC) in 1974 National Policy on Education 1986 Programme of Action 1992 Salamanca Statement in 1994 persons with disability act 1995 Sarva Shiksha Abhijan 2001 National Curriculum Framework 2005 United Nations Convention on Rights of Person with Disabilities (2006) Right to Education Act 2009, RPWD Act 2016 have discussed inclusion in varying manners (Handbook of Inclusive Education p. 45-47). Recently the National Education Policy (NEP) 2020 has underscored the significance of Inclusive Education and inclusive classroom practices for fostering development of every student irrespective of their backgrounds or abilities (NEP, 2020, p. 24). This research paper aims to contribute to the conversation about enhancing mathematics education in classrooms by incorporating insights, from cognitive load theory. This study delves into the idea of load theory (CLT). How it can be utilized in teaching mathematics to students, in inclusive classrooms, particularly those, with varying learning requirements. Inclusive mathematics classrooms can be enriched with meaningful learning experiences for all learners by teachers who tailor their instructional strategies depending on different and unique cognitive profiles of students. The initial part of the paper gives an introduction to the theory of cognitive loads. It also outlines why teachers must have knowledge about cognitive load theory since it is essential in inclusive classrooms for better teaching practices. The second section focuses on the obstacles and opportunities to implementing cognitive load theory into inclusive math classrooms, such as differences in thinking skills, prior knowledge, et cetera. Inclusionary techniques suggested by Cognitive Load Theory are vital towards facilitating a positive environment in which students with varying abilities can learn together in maths classrooms. If teachers emphasize effective instructional design, they would make their educational experience more comprehensive for each other's consideration so that everybody succeeds at school and has a positive educational experience.

KEY WORDS: Inclusive Mathematics Education, Inclusive Classroom Practices, Children with diverse learning needs, Cognitive Load Theory, Instructional Design,

INTRODUCTION

In recent years, the concept of inclusive classrooms has gained significant attention in teacher education (NEP, 2020, p. 28). Educators have paid close attention to the concept of inclusive classrooms as they attempt to establish learning environments that meet the different needs of all children. The National Education Policy 2020 aims to provide equal opportunities for quality education to all learners, including those with disabilities, and special needs or from disadvantaged backgrounds (NEP, 2020, p. 24-27). Within the realm of school education, one particular subject that has posed challenges for students with diverse learning needs is mathematics. Mathematics education has an important role in developing students' critical thinking skills, problem-solving abilities, and overall cognitive development. However, the complexity of

mathematical concepts and the cognitive demands involved in learning mathematics can present significant barriers to students with diverse learning needs (Das, 2021). Cognitive load theory is a theory that provides an effective framework for understanding how the human mind processes information and how instructional design can maximize learning outcomes (Clerk et al., 2006). By examining the cognitive processes involved in learning mathematics, educators can develop strategies to reduce cognitive overload and enhance student understanding. This paper explores Cognitive Load Theory's application in the context of inclusive classrooms, focusing on how these principles can be leveraged to support students with diverse learning needs in mathematics education. Key considerations in creating inclusive mathematics classrooms include differentiation of instruction, providing multiple means of representation, engagement, and expression, and fostering a



supportive learning environment that values diversity (Handbook of Inclusive Education p. 14, 22, 63). By tailoring effective teaching practices to accommodate students with diverse learning needs, educators can establish a more equal learning environment in which every student has the chance to succeed (Scherer et al., 2016). This paper reviews the current literature on inclusive classroom practices in mathematics education, highlighting the challenges faced by students with different learning needs and the potential benefits of applying CLT principles to address these challenges. By identifying the cognitive barriers that impede student learning and implementing research-based strategies informed by CLT, educators can design more effective instructional methods that promote deeper understanding and mastery of mathematical concepts for all students. Through a combination of theoretical insights and practical implications, this paper aims to provide educators with a comprehensive understanding of how CLT can be applied in inclusive mathematics classrooms to enhance outcomes of learning for students with diverse learning needs.

METHODOLOGY

The methodology of the study is qualitative in nature. This paper has reviewed and critically analyzed existing research on cognitive load theory and its implications for equity and inclusion in mathematics education. Relevant databases and Google Scholar, have been used to identify scholarly articles, empirical studies, and theoretical frameworks that address the intersection of cognitive load and equity in educational settings. Books, documents, and government policies have also been considered as kinds of literature. The inclusion criteria focused on studies that are directly engaged with cognitive load theory and its application in diverse educational contexts to promote equitable and inclusive learning experiences while maximizing the learning outcome. This study also includes the recent pieces of literature on inclusive classroom practices in mathematics education, focusing on the obstacles faced by students with various learning needs and the potential benefits of using CLT principles in an inclusive classroom setting. National Education Policy 2020 encompasses a wide range of learners with special learning needs who may require additional support or accommodations to access and succeed in education (NEP, 2020, p. 24-27). However, this study only consists the students who are gifted and talented, children with specific learning disabilities like dyslexia, dyscalculia, and dysgraphia, etc, children with attention deficit hyperactivity disorder, children with cultural and linguistic diversity, children with behavioural disorders, and children from socio-economically disadvantaged backgrounds. This study will not be useful for students with major disabilities and who need continuous help and support in classroom.

WHAT IS COGNITIVE LOAD THEORY?

Cognitive load theory is a psychological framework that explores how the processing capabilities of human memory can impact learning and performance (Gerjets, Scheiter & Cierniak, 2009, p. 44). The theory was developed by educational psychologist John Sweller in the year 1988 (Sweller, 1988). This theory focuses on the limitations of working memory and the importance of managing cognitive load to optimize learning outcomes (Clerk et al., 2006). Cognitive load theory suggests

that our working memory's capacity for processing information is limited (Sweller, 2020; Sweller & Chandler, 1991). When learners are presented with new material, they must actively process and make sense of it using their working memory. If the cognitive load is too high – either due to the complexity of the material or the instructional design – learners may struggle to understand and retain information effectively (Kirschner et al., 2006). There are three types of cognitive loads identified in this theory: intrinsic, extraneous, and germane (DeLeeuw & Mayer, 2008; Clerk et al., 2006). Intrinsic load refers to the inherent complexity of the material being learned (Chandler & Sweller, 1991). Some topics are naturally more difficult to grasp than others, leading to a higher intrinsic cognitive load. Extraneous load, on the other hand, is caused by the way information is presented or the instructional design itself (Mostyn, 2012). When extraneous load is high, learners may find it challenging to focus on the core concepts due to distractions or irrelevant details. Lastly, germane load relates to the cognitive effort needed to build meaningful connections and schema in long-term memory (Sweller et al., 1998). This type of cognitive load is essential for deep understanding and retention of information (Clerk et al., 2006).

WHY DOES EVERY TEACHER NEED TO LEARN IT?

Understanding cognitive load theory is essential for teachers because it provides valuable insights into how students process and learn new information (Clerk et al., 2006). By applying the principles of this theory, educators can design instruction that reduces extraneous load, optimizes intrinsic load, and enhances germane load (Van Merriënboer et al. 2006). Teachers who are aware of cognitive load theory can make informed decisions about instructional strategies, lesson pacing, and content delivery (Clerk et al., 2006, p. 8). For example, they can break down complex topics into smaller, more manageable chunks to reduce cognitive overload (Mostyn, 2012). They can also provide scaffolding and support to help students gradually build their understanding without overwhelming their working memory. Moreover, incorporating techniques such as worked examples, modeling, and cognitive prompts can help learners allocate their cognitive resources more efficiently (Clerk et al., 2006). By structuring lessons to minimize extraneous load and promote germane processing, teachers can create an environment that supports deep learning and knowledge retention (Clerk et al., 2006). In a world where students are constantly bombarded with information and distractions, educators face the challenge of capturing and maintaining their attention. Cognitive load theory offers a framework to address this challenge by guiding teachers in creating engaging and effective learning experiences. By optimizing cognitive load, teachers can help students focus on the most critical aspects of a lesson, leading to enhanced comprehension and mastery of the content. Dylan William, a British educationalist, referred to cognitive load theory as "the single most important thing for teachers to know" (William, 2017). Every teacher should familiarize themselves with cognitive load theory to ensure that their teaching practices are informed by the latest research in cognitive psychology, ultimately benefiting their students' learning experiences.



WHY UNDERSTANDING OF COGNITIVE LOAD THEORY IS IMPORTANT FOR RUNNING AN INCLUSIVE CLASSROOM

Knowledge about cognitive load theory is very important to run an inclusive classroom. Cognitive load theory emphasizes the importance of managing intrinsic, extraneous, and germane cognitive load to optimize learning (Clerk et al., 2006). However, in inclusive classrooms, finding the balance between challenging students to reach their potential and providing the necessary support to manage cognitive load effectively poses a significant challenge. Educators must tailor instruction to meet diverse needs, ensuring that all students are appropriately challenged without being overwhelmed. Another reason is that many students have executive functioning challenges, such as difficulties with organization, planning, and self-regulation, and may experience high cognitive load when they do complex mathematical tasks (Handbook of Inclusive Education, 2020). Implementing cognitive load theory in inclusive settings involves addressing these executive functioning challenges through targeted support and explicit instruction in strategies for managing cognitive load. Designing of assessments is very important for inclusive classrooms. Designing an assessment for inclusive classrooms that aligns with cognitive load theory and provides meaningful insights into students' cognitive processing during mathematical tasks is challenging. Delivering targeted feedback that addresses not only mathematical accuracy but also the cognitive processes underlying learners' responses can be complex in inclusive settings. Cognitive Load Theory can help in this regard.

CHALLENGES IN INCLUSIVE MATHEMATICS CLASSROOM FROM THE PERSPECTIVE OF COGNITIVE LOAD THEORY

Inclusive classrooms face several challenges, particularly when considering the diverse range of cognitive abilities and learning needs present in such settings. Cognitive load theory focuses on the amount of mental effort required for learning and offers valuable insights into how learner process the information and learn. Applying cognitive load theory in inclusive settings will arise certain challenges. The challenges are:

1. **Diverse Learning Needs:** In an inclusive mathematics classroom, students have diverse learning needs due to varying abilities, backgrounds, and experiences (NEP, 2020, p. 26). The challenge in implementing cognitive load theory is finding a balance in managing the cognitive load for each student, considering their individual differences.
2. **Limited Prior Knowledge:** Students in inclusive mathematics classrooms may have gaps in their prior knowledge or mathematical skills (Grootenboer & Sullivan, 2013), which can influence their achievement (Hailikari et al., 2008) and increase their cognitive load when learning new concepts (Gupta & Zheng, 2020).
3. **Language and Communication Barriers:** In inclusive classrooms, students may have diverse language proficiencies and communication challenges which can impact their cognitive load during mathematics instruction. Language barriers can significantly

increase learners' cognitive load as learners struggle to comprehend mathematical concepts presented in a language that is not their primary or most proficient language (Faragher et al., 2016; Verzosa & Mulligan, 2013).

4. **Behavioural and Attention Challenges:** Some students in inclusive classrooms may have behavioural issues or attention difficulties, which can affect their ability to manage cognitive load during mathematics learning activities.
5. **Resource Limitations:** In some inclusive classrooms, there may be limitations in terms of instructional resources and support personnel, which can present challenges in learning and learners may hamper their learning.
6. **Assessment:** It can be difficult for teachers to accurately assess the learning of each student in a diverse, inclusive classroom setting (Mills et al., 2014). Also considering the cognitive load experienced by the students is equally difficult for any teacher in an inclusive classroom.

PROBABLE SOLUTIONS TO DEAL WITH THE CHALLENGES IN INCLUSIVE CLASSROOMS FROM THE PERSPECTIVE OF COGNITIVE LOAD THEORY

Along with the challenges of inclusive classrooms, there are also potential solutions to address these issues. The solutions are:

1. To address the challenge of diverse learning needs teachers can employ differentiated instruction techniques (Handbook of Inclusive Education, p-63). This involves modifying the content, process, and products of learning to accommodate diverse learning needs. For example, teachers can provide varied levels of support, such as visual aids, manipulatives, or scaffolded instruction, to manage the cognitive load for students with different abilities.
2. To address the limited prior knowledge issue the teachers can implement pre-assessments to identify students' prior knowledge gaps and then provide targeted interventions to fill these gaps (Hailikari et al., 2008). By building on students' existing knowledge (Clerk et al., 2006), educators can optimize cognitive load management and promote a better understanding of new mathematical concepts.
3. To address the language and communication-related issues teachers must employ effective language support strategies while teaching mathematical content. Teachers can use visual aids, hands-on activities, and technology to supplement verbal instruction, making mathematical concepts more accessible to students with varied language abilities. Providing multilingual support materials (NEP, 2020) and encouraging peer collaboration can also help reduce language and communication barriers, thereby managing cognitive load for all students.
4. To address behavioural and attention-related challenges, educators can employ strategies that promote engagement and focus, such as incorporating



frequent breaks, providing clear and structured instructions with cues (Clerk et al., 2006, p.78). Additionally, employing multi-sensory teaching approaches and incorporating movement into lessons can help to capture the attention of students with diverse learning needs, thereby reducing cognitive load related to behavioural and attention challenges.

5. To solve the resource limitations the teachers can leverage technology and digital resources to support cognitive load management, such as using educational apps, interactive simulations, and online tutorials to provide additional support to students with different learning needs (Handbook of Inclusive Education p. 55). Collaboration with special education professionals, resource teachers, and teacher assistants is necessary in addressing resource limitations by providing additional support and expertise to manage cognitive load effectively.
6. Teachers can use formative assessment strategies to gauge students' cognitive load and understanding of mathematical concepts. This can include techniques such as exit tickets, one-on-one conferences, and observation of students' problem-solving processes. By gathering ongoing feedback, educators can adjust their instructional methods and provide targeted support to manage the cognitive load for each student effectively.

COGNITIVE LOAD THEORY STRATEGIES FOR PROMOTING INCLUSIVE CLASSROOMS

Cognitive load theory can be applied to mathematics instruction for students with different needs in various ways to optimize their learning experiences. Here are some specific examples:

1. **Modifying Task Complexity:** Cognitive load theory suggests that instructional tasks should be designed with an appropriate level of complexity to match students' cognitive abilities. For students with learning disabilities or other challenges, such as attention deficits, educators can modify the complexity of mathematical tasks by breaking them down into smaller, more manageable steps (Gupta & Zheng, 2020). This helps reduce the intrinsic cognitive load and allows students to concentrate on mastering one concept or skill at a particular time (Clerk et al., 2006, p. 44).
2. **Explicit Instruction with Clear and Consistent Organization:** Present instructional materials in a clear, organized, and easily accessible format. Well-structured materials reduce the cognitive load associated with decoding and processing information, allowing students to focus more on the content itself (Clerk et al., 2006, p. 43). Organizing learning environments clearly and consistently is also important. Predictable routines, visual schedules, and well-structured lessons can help reduce extraneous cognitive load associated with uncertainty and disorganization. Provide clear, step-by-step explanations of mathematical concepts and procedures, breaking down complex ideas into more manageable portions. Explicit instruction also helps to

reduce the extraneous cognitive load by delivering information in a structured and easily digestible manner.

3. **Scaffolded Support:** Scaffolded support aligns with cognitive load theory by providing additional support and guidance to students as they work through math problems (Riccomini & Morano, 2019). Educators can scaffold instruction for students with diverse needs by offering prompts, cues, and differentiated levels of support based on individual learning profiles. This helps manage the cognitive load by gradually transitioning students from needing high levels of support toward greater independence in problem-solving (E- Learning Company Blog, 2023). By scaffolding the learning process and gradually releasing responsibility to students, educators can reduce cognitive load by ensuring that all students can access and process the information at a pace that aligns with their individual learning needs.
4. **Chunking Information:** In psychology, chunking is a cognitive process that groups information into meaningful pieces to increase working memory capacity. Chunking helps people overcome the constraints of short-term memory by organising information into manageable pieces that are simpler to remember and comprehend. By breaking down complicated information into understandable chunks or patterns, chunking aids in cognitive efficiency, memory recall, and problem-solving (E- Learning Company Blog, 2023; Mostyn, 2012).
For instance, if you try to memorise the letter combination h-t-r-e-o-b-r, you have to memorise seven things at once since each letter stands for one object. Now, you have to commit the same seven objects to memory if you try to remember the letter combination b-r-o-t-h-e-r. However, you may merge the letters into a single item since you already have a schema for the word "brother" in your long-term memory. This frees up your working memory to recall other things (Cognitive load theory: Research that teachers really need to understand, 2017). Another example is, when memorizing a long string of numbers like "7462918305," instead of trying to remember each digit individually, chunking allows a person to group the numbers into chunks like "746," "291," "8305," making it easier to remember the sequence as a whole.
5. **Multimodal and Multisensory Instruction:** Multisensory approaches to teaching math can engage students with varying cognitive abilities by incorporating different sensory modalities to enhance learning (Handbook of Inclusive Education p. 72). These approaches allow students with diverse learning needs to access the material through different sensory channels, reducing the cognitive load associated with processing information in a single modality. So, present information using a variety of modalities, such as visual aids, manipulatives, and verbal explanations so that every student can be benefited and can use the maximum of it (Kalyuga, 2009).



i) Manipulatives and Concrete Materials:

Use physical objects such as number paddle, tens frame (Clarke & Faragher, 2015) counting bears, base-ten blocks, fraction tiles, geometric solids, and other manipulatives to help students visualize and manipulate mathematical concepts. Incorporate hands-on activities that allow students to physically interact with mathematical ideas, such as using tangrams to explore geometry or using fraction bars to understand fractional relationships.

ii) Providing Visual Representations: Visual representations (Faragher et al., 2016), such as manipulatives, diagrams (Clerk et al., 2006, p. 57), charts, and graphic organizers can be particularly beneficial for students with different needs who may struggle with purely symbolic representations, including those with dyscalculia or visual-spatial processing difficulties. For example, use number lines, arrays, area models, and graphic representations of word problems to support visual learners in understanding mathematical relationships. Integrate color-coding, signaling, and visual cues to highlight patterns (Clerk et al., 2006), relationships, and operations within mathematical content, making it easier for students to process and remember information. By incorporating visual representations into mathematics instruction, educators can reduce the extraneous cognitive load associated with abstract concepts (Clerk et al., 2006) and make mathematical ideas more accessible and tangible for these students.

iii) Audio and Verbal Reinforcement:

Provide auditory supports such as math songs, rhymes, and chants to reinforce mathematical concepts and promote memory retention specially for low prior knowledge learners (Clerk et al., 2006, p. 69). Using music, rhythm and rhyme can support students with auditory learning preferences in remembering and understanding mathematical procedures and facts (Handbook of Inclusive Education p. 65, 67). Encourage verbal explanations and discussions where students articulate their mathematical thinking, reasoning, and problem-solving processes. This verbal reinforcement can help students solidify their understanding of mathematical concepts and build language-based connections to mathematical ideas.

iv) Kinesthetic Activities:

- Implement kinesthetic activities that involve movement and physical engagement to reinforce mathematical concepts. For instance, make students act out addition and subtraction with physical movements, create human number lines, or use kinesthetic games to reinforce concepts like symmetry and transformations in geometry. Incorporate movement-based strategies such as using gestures to represent mathematical operations and incorporate physical games that reinforce the numerical concepts (Handbook of Inclusive Education p. 67).

v) Technology Integration:

- Integrate educational technology tools and applications (NEP, 2020, p. 4) that offer multisensory experiences, such as interactive math software, virtual manipulatives, and math games that engage auditory, visual, and kinesthetic modalities. Utilize digital tools that provide audio feedback, visual modeling, and interactive simulations to support students with varying cognitive abilities in experiencing math concepts through diverse sensory channels (Faragher et al., 2016).

vi) Real-World Applications: Student perform better when they connect mathematical concepts to real-world contexts and experiences (Casey, 2013). So, allow students to engage their senses in practical applications of math. For example, use cooking activities to explore fractions, measurement, and ratios, or take students on a geometry scavenger hunt to identify shapes and angles in the environment. Encourage students to use their senses to observe and analyze mathematical patterns and relationships in their surroundings, fostering a sensory-rich approach to mathematical exploration.

6. Individualized Learning Plans: Developing individualized learning plans for students with varying cognitive abilities can provide targeted support. These plans outline specific accommodations, modifications, and individualized goals tailored to each student's cognitive strengths and challenges, ensuring that they receive the necessary support to thrive in mathematics instruction (Handbook of Inclusive Education p. 96-114).
7. Collaborative Learning Opportunities: Encourage collaborative learning experiences, such as group problem-solving activities and peer tutoring. Collaborative learning provides opportunities for students to share cognitive resources, support one another, and benefit from diverse perspectives and approaches to solving mathematical problems (Shank & Cotten, 2014; Casey, 2013; Faragher et al., 2016). Flexible grouping strategies allows students to work in collaborative settings while ensuring that they receive appropriate support based on their cognitive abilities. Teachers can create small groups or pairs based on student needs, mixing students with different abilities to provide peer support and enabling students to support each other and learn at the appropriate pace.
8. Implementing Universal Design for Learning (UDL) Principles: Universal Design for Learning, which aligns closely with cognitive load theory, emphasizes the need for flexible instructional methods and materials to accommodate diverse learners (Handbook of Inclusive Education, p-63). Educators can apply UDL principles by providing options for representation, expression, and engagement in mathematics instruction, allowing students with different needs to access and demonstrate their understanding of mathematical content in ways that align with their strengths and preferences.



9. Explicitly Teaching Metacognitive Strategies: Teach students metacognitive strategies (E- Learning Company Blog, 2023) for managing their cognitive load, such as self-monitoring, self-questioning, self-explanation (Clerk et al., 2006, p. 226-233) and reflection. By fostering metacognitive awareness, students can become more adept at recognizing when cognitive load is excessive and employing strategies to address it. By explicitly teaching and reinforcing these metacognitive strategies, educators can equip students with the tools to become more autonomous, strategic, and effective learners in mathematics. This is particularly important for students with diverse needs, as it empowers them to manage their cognitive processes and navigate mathematical challenges more confidently and successfully.
10. Formative Assessment, Feedback, and Revision Practices: Implementing formative assessment strategies (NEP, 2020, p. 4) in place of summative assessment allows teachers to monitor students' progress and adjust instruction based on their cognitive abilities. Provide timely and constructive feedback that focuses not only on mathematical correctness but also on cognitive processes. Encouraging students to revise their work based on feedback can promote deeper understanding of the concepts while reducing the cognitive load associated with uncertainty and errors.
11. Provide options for assessment: Offer students a variety of ways to demonstrate their understanding of the material, such as through traditional tests, projects, presentations, or portfolios (Handbook of Inclusive Education p. 55, 73). This allows students to showcase their strengths in alternative ways, however the expectations about the quality should be same (Faragher et al.,2016).
12. Create a Positive & Supportive Classroom Environment: Creating a positive & supportive classroom environment is essential for supporting students with varying cognitive abilities (Handbook of Inclusive Education p. 26). Foster a classroom culture that celebrates diversity and encourages students to embrace their individual strengths and differences (Faragher et al.,2016). Encourage collaboration, respect, and empathy among students (Handbook of Inclusive Education p. 24). Encourage open communication (Faragher et al.,2016) and fostering a growth mindset that can help students feel valued and empowered to engage with mathematical concepts at their individual cognitive levels.
13. Culturally Responsive Teaching: Recognizing the cultural backgrounds and experiences of students and integrating culturally relevant examples and contexts in mathematics instruction can support students with varying cognitive abilities. Making connections between mathematical concepts and students' cultural experiences can enhance engagement and understanding, creating a more inclusive learning environment. NEP 2020 has also mentioned to

consider students cultural background while teaching them (NEP, 2020, p. 25)

14. Offer additional support: Allow students to progress through the material at their own pace, providing extra support or challenges as needed. Provide extra memory support, resources, such as tutoring sessions, study guides, or additional practice problems, for students who need more help in understanding the material ((Handbook of Inclusive Education p. 55; Clerk et al., 2006, p. 43). Provide difficult questions and assignments for those students who have already mastered the concepts. This helps students feel more in control of their learning and can increase their motivation.

CONCLUSION

Inclusive mathematics classrooms prioritize understanding, engagement, and support for students with diverse learning needs which are essential for promoting academic success and fostering a lifelong love for learning. The integration of Cognitive Load Theory (CLT) principles in inclusive mathematics classrooms presents a promising approach for supporting students with diverse learning needs in school education. By acknowledging the cognitive barriers that hinder student learning and implementing instructional strategies that reduce cognitive load, educators can create a more inclusive and equitable learning environment where all students have the opportunity to excel in mathematics. As the field of mathematics education continues to evolve, educators need to remain updated about best practices in supporting students with different learning needs in inclusive classrooms. By applying CLT principles and incorporating research-based strategies into their teaching practices, educators can create a dynamic and engaging learning environment that empowers all students to reach their maximum potential in mathematics. Through the lens of CLT, educators can design differentiated instruction, provide multiple means of representation, engagement, and expression, and cultivate a supportive classroom culture that values diversity. The Educators may require targeted professional development to effectively apply cognitive load theory within the context of inclusive mathematics classrooms. Building educators' capacity to understand, implement, and assess instructional practices aligned with cognitive load theory while addressing diverse learning needs is essential but may pose resource and time constraints for schools. Educators and educational professionals must collaborate to develop and implement strategies that promote inclusive and accessible learning environments while leveraging the cognitive load theory's principles to optimize students' learning experiences. This may involve ongoing professional development, collaboration with specialists in inclusive education, and a commitment to continuous refinement of instructional practices. By embracing inclusive practices educators can empower all students to engage meaningfully in mathematical learning and develop the skills needed for academic success and lifelong learning. These approaches will not only benefit students with diverse learning needs but will also enhance the learning experience for all students, fostering a more inclusive and enriched educational environment.



ACKNOWLEDGEMENTS

This study is part of a doctoral fellowship, which is financed by the University Grants Commission (Savitribai Jyotirao Single Girl Child Fellowship) and the Indian Council of Social Science Research (ICSSR Full-Term Doctoral Fellowship), New Delhi.

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KARANASAN NG MGA GURO SA PAGGAMIT NG METAKOGNITIBONG PAGBASA SA PAGTUTURO NG FILIPINO: ISANG PENOMENOLOHIYANG PAG-AARAL

Ansar D. Amiang, Maed-Edad, Matell, Maed-Fil.¹, Diza M. Rolid, Ed.D.²

¹ORCID No. 0009-0003-9289-4645

Master Teacher I, Mayo National High School, Mayo, City of Mati, Davao Oriental, Philippines

²ORCID No. 0009-0001-1751-7167

Quality Management Director, St. Mary's College of Tagum, Inc., Tagum City, Davao del Norte Philippines

Article DOI: <https://doi.org/10.36713/epra16298>

DOI No: 10.36713/epra16298

ABSTRAK

Ang layunin ng penomenolohiyang pananaliksik na ito ay matukoy at magalugad ang karanasan ng labing-apat (14) na mga guro ng Senior High School sa pampublikong paaralan ng Hilagang Mati, Sangay ng Lungsod ng Mati, Davao Oriental sa paggamit sa metakognitibong pagbasa sa pagtuturo ng Filipino. Dagdag pa, ito ay inasahang makapagbibigay tugon sa mga hamong naranasan ng kaguruan. Ang mga naging partisipante sa penomenolohikal na pag-aaral na ito ay pinili gamit ang purposive sampling. Ang mga tugon ay nakalap gamit ang pinalalim na panayam at pangkatang talakayan. Ito ay sinuri gamit ang tematikong pag-aanalisa. Ang mga nasuring pahayag tungkol sa karanasan sa paggamit ng metakognitibong pagbasa ay: kakulangan sa kasanayan sa metakognitibong pagpapabasa; kakulangan sa kaalaman sa pagpapabasa; kahirapan sa pag-unawa sa tekstong binasa; kahinaan sa kasanayan sa pagpapakahulugan; at kakulangan ng tekstong babasahin. Tungkol naman sa tanong kung paano hinarap ang mga hamon na naranasan, ang mga nabuong tema ay: pagsagawa ng ebalwasyon sa pagbasa; paggamit ng iba't ibang estratehiya sa pagbasa; pagkuha sa interes ng mambabasa; pagpapaunlad ng bokabularyo; at paghahanap ng mga tekstong babasahin. Ang mga pangunahing tema na: magkaroon ng plano sa pagbasa; magkaroon ng sapat na kaalaman sa paggamit ng metakognitibong pagbasa; matukoy ang kakayahan sa pagpapabasa; mahimok ang interes sa pagbabasa; maipagpatuloy ang paggamit ng metakognitibong pagbasa; at magkaroon ng angkop at sapat na tekstong babasahin ay mga lumitaw na tema tungkol sa posibleng implikasyon sa karanasan ng mga guro. Mahalaga ang pananaliksik na ito sapagkat matutulungan ang kaguruan kung paano at ano ang akmang pamamaraan ng paggamit ng metakognitibong pagbasa bilang estratehiya sa pagtuturo at pagkatuto ng mga mag-aaral sa asignaturang Filipino.

MGA SUSING SALITA: karanasan, guro sa senior high school, metakognitibong pagbasa, pagtuturo, asignaturang Filipino, penomenolohiya, Sangay ng Lungsod ng Mati

INTRODUKSIYON

Ang pagbasa ay napakahalagang kasanayan sa larangan ng edukasyon. Ang paggamit ng tamang estratehiya sa pagbasa ay may malaking epekto sa pag-unawa sa tekstong binabasa. Isa ang metakognitibong pagbasa na ginagamit upang maunawaan at maanalisa ng tama ang mga konsepto sa isang artikulo. Ngunit, may mga suliraning kinakaharap ang kaguruan sa paggamit ng metakognitibong pagbasa sa pagtuturo ng Filipino. Mapapansin dito ang hindi tamang pamamaraan dahil hindi sapat ang kakayahan at kaalaman; hindi akma sa lebel ng mag-aaral kaya, nagdudulot ito ng kamalian o hindi tamang pagkaintindi sa mga ideya at detalye sa tekstong binasa.

Sa Asya, marami ang tumatalakay sa paggamit ng metakognitibong pagbasa sa pagtuturo. Sa Vietnam, maraming nahihirapan paano matamo ang kahusayan sa metakognitibong

pagbasa dahil sa kakulangan ng kakayahan paano ipaunawa ang mga teksto. Ang pagkakaroon ng kakulangan sa bokabularyo, leksikal at sintaktikong kaalaman, kulang sa kasanayan sa pagbabasa at motibasyon sa loob ng klase ang mga nakikitang dahilan (Thuy, 2020).

Sa Malaysia, hindi gaanong binibigyang-pansin ang pagtuturo sa pagbasa. Lumabas na may mga guro na gumagamit ng metakognitibong pagbasa ngunit walang tiyak na pamamaraan paano ito gamitin. Dagdag pa rito, ang mga guro ay may kakulangan sa kaalaman, walang istandardisadong instrumentasyon at espesipikasyon sa paggamit ng metakognitibong pagbasa (Babashamsi, Kotamjani & Noordin, 2022). Sa bansang Cyprus naman, nahihirapan ang kaguruan sa magkakaibang pamamaraan ng paggamit ng metakognitibong pagbasa dahil hindi rin alam ang mga estratehiyang ginagamit sa



klase kaya nawawalan ng motibasyon sa pagbabasa ang mga mag-aaral (Khellab et al., 2022).

Sa Pilipinas, batay sa resulta na ipinalabas ng *Program for International Student Assessment (PISA)* sa taong 2018, ang bansa ay nasa ika pitumpo't pitong posisyon sa larangan ng pagbasa. Masasabing dulot ito ng mababang antas sa kasanayan sa pag-unawa sa binasa dahil hindi naaayon ang estratehiyang ginamit sa pagbasa (Villanueva, 2022). Sa Lungsod ng Tuguegarao, nakikitang suliranin ang kawalan ng interes at pagpapahalaga sa pagbasa at pag-unawa at dulot nito ay ang mababang pagkaintindi ng mag-aaral sa tekstong binabasa (Lagat, 2021).

Bilang karagdagan, sa Batanes, lumabas na ang kakayahang pagbasa ay nasa pinakamababang antas sa isinagawang *National Achievement Test (NAT)*. Sinasabing ang kakapusan sa pag-unawa at interes sa pagbasa ang siyang nakikitang dahilan ng pagkakaroon ng mababang resulta. Kaugnay nito, ang hindi wastong estratehiya sa pagtuturo ay nagreresulta rin ng hindi mataas na pag-unlad sa kaalaman ng mga mag-aaral lalo na sa pagbasa (Daguay-James & Bulusan, 2020).

Sa Sangay ng Lungsod ng Mati, partikular sa Hilagang Mati, napag-alamang ang mga gurong nagtuturo ng mga kursong tumatalakay sa Filipino ay halos lahat hindi medyor sa Filipino. Batay sa aking personal na obserbasyon, nakitaan ng kakulangan sa kaalaman sa paggamit ng metakognitibong pagbasa sa pagtuturo. Nakita ang mababang interes sa paggamit dahil hindi sapat ang kaalaman upang gamitin ito sa pagtuturo. Dagdag pa rito, nahirapan ang kaguruan sa paggamit ng metakognitibong pagbasa sa klase dahil sa mababang interes sa pagbabasa sa mga akdang nasa wikang Filipino. Nariyan din ang pagkakaroon ng kalituhan sa paggamit ng bawat salita o pagbuo ng pangungusap, maling baybay, mababang komprehensiyon, at kakulangan sa semantikong pag-unawa.

Pinatutunayan ang mga sitwasyong nabanggit sa itaas sa isang pag-aaral sa Indonesia kung saan ang pagbasa ay isa sa mga hindi umuunlad na kakayahang panglingguwistiko. Ito ay dulot ng kakulangan sa karanasan sa pagkatuto paano bumasa bunga ng hindi wastong pagtuturo sa pagbabasa. Dahil dito, ang kognitibo at metakognitong kakayahan sa pagbasa ay hindi umuunlad (Wikandari, 2020). Maihalalintulad ito sa lungsod ng Dagupan kung saan nalaman na ang mag-aaral ay hindi mataas ang kakayahang umintindi sa teksto gamit ang estratehiya na pagbasang may pag-unawa. Sa nakuhang mababang pag-unawa, nangangahulugang kulang sa kaalaman sa semantika at limitado ang pagpapakahulugan sa mga salita (Perez, 2019).

Kaya, nangangailangan ito ng agarang pag-aaral upang mabigyan ng kasagutan ang nabanggit na mga suliranin sa itaas. Kailangang maging wasto at higit sa lahat ay magkaroon ng sapat na kaalaman ang kaguruan paano gamitin ang metakognitibong pagbasa bilang

stratehiya sa patuturo ng Filipino. Kailangan ding makapagsagawa ng pananaliksik upang mabigyang-solusyon ang mga hamong kinakaharap ng kaguruan sa Filipino sa Hilagang Mati, Sangay ng Lungsod ng Mati habang ginagamit ang metakognitibong pagbasa sa bawat talakayan sa asignaturang Filipino.

Sa pagsisiyasat na ito, magiging makabuluhan ang makukuhang impormasyon sa pagpapataas sa antas ng kasanayan at kakayahan ng kaguruan sa paggamit ng metakognitibong pagbasa habang nagtuturo ng Filipino. Ang mag-aaral ay mabibigyan din ng sapat na kasanayan at kakayahan na unawain ang mga nangyayari sa lipunan.

Sa lipunan, ang resulta ng pananaliksik ay magsisilbing kasagutan o tugon sa mga suliraning kinakaharap patungkol sa kakayahan sa pag-unawa. Sa pamamagitan ng pagbabahagi sa pagpupulong ng barangay, mailalahad ang mga estratehiya at pamamaraan sa metakognitibong pagbabasa. Sa paraang ito, mas mauunawaan ang mga pangyayari o ang mga isyung nagaganap sa lipunan. Kaya, kinakailangang maging wasto at higit sa lahat ay magkaroon ng sapat na kaalaman ang mamamayan paano gawin ang metakognitibong pagbabasa. Sa ganitong sitwasyon, mas mapadadali at mas lalong makasabay na unawain ang mga napapanahong pangyayari sa komunidad.

Ang mga resulta ng pananaliksik na ito ay ibabahagi o ipepresenta sa pamamagitan ng pagsali sa nasyonal o maging sa internasyonal na kumperensiya ng pananaliksik. Sa paraang ito, makakukuha ng mas malawak na mambabasa. Sa pamamagitan din nito, ang pag-aaral na ito ay magsisilbing halimbawa, batayan at maaring maging kaugnay na literatura sa pandaigdigang lebel ng pananaliksik na tumatalakay sa metakognitibong pagbasa.

Layunin Ng Pananaliksik

Layunin ng penomenolohiyang pananaliksik na ito ay matukoy at magalugad ang karanasan ng mga guro sa paggamit sa metakognitibong pagbasa sa pagtuturo ng Filipino sa Hilagang Mati, Dibisyon ng Lungsod ng Mati. Dagdag pa, ang ginawang pananaliksik ay inasahang makapagbibigay tugon at solusyon sa mga hamong naranasan ng kaguruan sa paggamit ng metakognitibong pagbasa sa pagtalakay ng mga aralin sa asignaturang Filipino.

Sa puntong ito ng pananaliksik, ang metakognitibong pagbasa ay nakatuon sa pagpapaunlad ng kasanayan at kakayahan sa pag-unawa ng mga tekstong Filipino na pinapabasa ng mga guro sa mga mag-aaral. Ito rin ay ang pagkakaroon ng mataas na kasanayang pampag-iisip na kinapapalooban ng aktibong pagkontrol sa mga prosesong kognitibo sa pagkatuto.

Mga Katanungan sa Pananaliksik

1. Ano-ano ang mga karanasan ng mga guro sa paggamit ng metakognitibong pagbasa sa pagtuturo ng Filipino?



2. Paano nalampasan o hinarap ng mga guro ang mga hamon sa paggamit ng metakognitibong pagbasa sa pagtuturo ng Filipino?
3. Ano ang posibleng implikasyon sa mga karanasan ng mga guro sa paggamit ng metakognitibong pagbasa sa pagtuturo ng Filipino?

METODOLOHIYA

Ang kwalitatibong penomenolohikal na disenyo ang ginamit sa pananaliksik upang malaman at galugarin ang mga karanasan ng mga guro sa paggamit ng metakognitibong pagbasa sa asignaturang Filipino. Gamit ang kwalitatibong pag-aaral, ang naging pokus ay mga buhay na karanasan kaguruan sa Hilagang Mati, Sangay ng Lungsod ng Mati. Dagdag pa rito, nilayon ng pag-aaral na ilarawan at ihayag ang mga tiyak na karanasan ng kaguruan na gumagamit ng metakognitibong pagbasa sa pagtuturo ng Filipino.

Ang mga partisipante sa penomenolohikal na pag-aaral na ito ay labing-apat (14) na mga gurong nagtuturo ng Senior High School sa pampublikong paaralan ng distrito ng Hilagang Mati, Sangay ng Lungsod ng Mati, Davao Oriental. Ang mga nasabing guro ay nagmula sa sampung (10) paaralan na pawang mula sa distrito ng Hilagang Mati na may mga karanasan sa paggamit ng metakognitibong pagbasa sa pagtuturo ng Filipino. Sa kabilang dako, para maisakatuparan ang penomenolohikal na kwalitatibong pag-aaral, ginamit ng mananaliksik ang malalimang pakikipanayam na may pitong (7) indibidwal na partisipante at pokus na pangkatang talakayan na may pitong (7) miyembro bilang mga partisipante. Ang labing-apat (14) na naging partisipante sa penomenolohikal na pananaliksik na ito ay pinili gamit ang purposive sampling.

Bilang karagdagan, sa pag-aaral na ito, ang mga partisipante ay pinili ayon sa sumusunod na krayterya: 1) dapat nagtuturo ng Senior High School sa pampublikong paaralan ng Hilagang Mati, Sangay ng Lungsod ng Mati aytem man o hindi pa; (2) dapat isang guro na may karanasan sa paggamit ng metakognitibong pagbasa sa pagtuturo ng asignaturang Filipino; (3) dapat isang gurong nagtuturo sa Taunang Panuruan ng 2023 - 2024; at (4) dapat ay

babae o lalaki na bago o matagal nang nagtuturo. Sa kabilang dako, hindi kasali sa pag-aaral na ito ang: 1) mga gurong nagtuturo ng Filipino sa Junior High School at kolehiyo; (2) mga gurong nagtuturo ng Filipino sa Senior High School mula sa pampribadong paaralan; (3) mga gurong nagtuturo ng Filipino sa Senior High School na hindi galing sa distrito ng Hilagang Mati; at (4) mga guro ng Filipino na hindi nagtuturo sa Taunang Panuruan 2023 - 2024.

Bukod dito, ang datos mula sa panayam ay sumailalim sa tematikong pag-aanalisa, isang fleksibol na pamamaraan sa kwalitatibong pananaliksik. Sa pag-aaral na ito, ang tematikong interpretasyon ay ginamit upang unawain ang karanasan ng mga guro sa paggamit ng metakognitibong pagbasa sa pagtuturo ng Filipino. Ang pag-aanalisa ay binase sa mga sagot ng mga kalahok, kung saan ang mga datos ay iniorganisa, pinaghiwalay, at pinag-aralan nang mabusisi. Ginamit din ang coding para sa pag-uuri at pagkategorya ng mga tugon ng mga kalahok. Sa pagtatapos, isinulat ang resulta at ipinakita sa isang talahanayan para sa masusing pag-aaral. Ang etikal na konsiderasyon ay naging bahagi rin ng proseso upang mapangalagaan ang kakanan ng mga kalahok.

MGA RESULTA

Mga Pangunahing Tema at mga Idea Tungkol sa Karanasan ng mga Guro sa Paggamit ng Metakognitibong Pagbasa sa Pagtuturo ng Filipino

Sa pagsusuri sa mga tugon ng mga partisipante sa unang tanong, isa-isa inilahad ang mga karanasan sa paggamit ng metakognitibong pagbasa sa pagtuturo ng Filipino. Ang mga nasuring pahayag mula sa mga tugon ng mga partisipante ay nakabuo ng sumusunod na tema: (1) kakulangan sa kasanayan sa metakognitibong pagpapabasa; (2) kakulangan sa kaalaman sa pagpapabasa; (3) kahirapan sa pag-unawa sa tekstong binasa; (4) kahinaan sa kasanayan sa pagpapakahulugan; at (5) kakulangan ng mga tekstong babasahin.

Talahanayan 1

Mga Pangunahing Tema at mga Idea Tungkol sa Karanasan ng mga Guro sa Paggamit ng Metakognitibong Pagbasa sa Pagtuturo ng Filipino

Mga Pangunahing Tema	Mga Pangunahing Idea
Kakulangan sa Kasanayan sa Metakognitibong Pagpapabasa	<ul style="list-style-type: none"> • Kakulangan sa kakayahan na ipaunawa ang teksto • Kakulangan sa bokabularyo • Kawilihan sa paggamit ng wikang Ingles • Kakulangan sa kaalaman sa pagbasa • Kawalan ng pagbibigay-pansin sa pagbasa • Walang katiyakan sa estratehiyang ginamit sa pagbasa • Kawalan ng kaalaman sa pag-unawa sa binasa.



Kakulangan sa Kaalaman sa Pagpapabasa	<ul style="list-style-type: none"> • Kawalan ng kaalaman sa makabagong pamamaraan ng pagpapabasa • Kakulangan ng kasanayan sa paggamit ng wikang Filipino • Kahirapan sa pagpili ng pamamaraang ilalapat sa pagpapabasa • Kawalan ng kasanayan sa pagpapakahulugan ng binasa
Kahirapan sa Pag-unawa sa Tekstong Binasa	<ul style="list-style-type: none"> • Kahirapan sa mga komplikadong salita • Kahirapan sa pag-unawa sa binasang teksto • Kahirapan sa pag-oorganisa sa naunawaan sa binasa • Kakulangan sa kasanayan sa pagbabasa
Kahinaan sa Kasanayan sa Pagpapakahulugan	<ul style="list-style-type: none"> • Kahinaan sa kasanayan sa pag-unawa • Walang sapat na kaalaman sa pagpapakahulugan • Kahinaan sa pagtukoy sa mga binasang impormasyon • Kawalan ng pagkakataong magamit ang wastong estratehiya sa pagpapabasa
Kakulangan ng mga Tekstong Babasahin	<ul style="list-style-type: none"> • Walang sapat na mapagkukunan ng materyal sa pagbasa • Walang bagong materyal sa pagbasa lalo na ang Filipino • Walang aklat o materyal at mga tekstong babasahin • Walang mga aklat na maipagagamit sa pagbabasa • Hindi sapat ang materyal sa pagbasa ang paaralan • Hindi na ginagamit ang mga aklat sa pagbabasa

Mga Pangunahing Tema at mga Idea Kung Paano Nalampasan o Hinarap ng mga Guro ang mga Hamon Hinggil sa Paggamit ng Metakognitibong Pagbasa sa Pagtuturo ng Filipino

Sinuri ang mga datos mula sa mga kasagutan ng mga kalahok sa ikalawang tanong na paano nalampasan o hinarap ng kaguruan ang mga hamon sa paggamit ng metakognitibong pagbasa sa pagtuturo ng Filipino. Sa ginawang pagsusuri, ginamit pa rin ang tematikong pag-aanalisa. Matapos masuri, tiniyak na ang mga datos ay wasto at tugma sa mga kasagutan ng mga partisipante.

Lumabas ang iba't ibang estratehiya kung paano nila nalampasan o hinarap ang mga pagsubok sa paggamit ng naturang estratehiya sa pagtuturo ng asignaturang Filipino. Magkakatulad ang mga kasagutan ng mga gurong-partisipante ayon sa kanilang mga ibinahaging karanasan.

Sa pagsuri sa mga pahayag ng mga partisipante, ang sumusunod na tema ay nabuo: (1) pagsagawa ng ebalwasyon sa pagbasa; (2) paggamit ng iba't ibang estratehiya sa pagbasa; (3) pagkuha sa interes ng mambabasa; (4) pagpapaunlad ng bokabularyo; at (5) paghahanap ng mga tekstong babasahin.



Talananayan 2
Mga Pangunahing Tema at mga Idea Kung Paano Nalampasan o Hinarap
ng mga Guro ang mga Hamon sa Paggamit ng Metakognitibong
Pagbasa sa Pagtuturo ng Filipino

Mga Pangunahing Tema	Mga Pangunahing Idea
Pagsagawa ng Ebalwasyon sa Pagbasa	<ul style="list-style-type: none"> • Pagbigay-puna matapos ang pagbabasa • Pagsuri sa pag-unawa sa pamamagitan ng ebalwasyon. • Pagbigay pagtataya upang tukuyin ang antas ng pagbabasa • Pagtukoy sa kakayahan bago magpabasa • Paggawad ng gantimpala sa may mataas ang pag-unlad sa pagbabasa
Paggamit ng iba't ibang Estratehiya sa Pagbasa	<ul style="list-style-type: none"> • Paggamit ng ilustrasyon para ipakita ang kabuoan ng kuwento • Pagpasagot sa mga katanungan matapos magbasa • Pagpabasa ng teksto sa tahimik na paraan • Pagkaroon ng layunin, iskema at damdamin sa pagbasa • Pagpabasa sa tulong ng magaling na estudyante
Pagkuha sa Interes ng Mambabasa	<ul style="list-style-type: none"> • Pagkaroon ng koneksiyon ng binabasa sa karanasan ng mambabasa • Pag-alam sa estado ng mag-aaral bago magpabasa • Pagbatay sa hilig at interes ng mga mag-aaral • Paggamit ng mga tekstong pupukaw sa kamalayan ng mambabasa • Paggamit ng teknolohiya sa pagbabasa • Pagbigay-atensiyon sa mga mambabasa • Pagbigay-puntos kapag maraming teksto ang nabasa
Pagpapaunlad ng Bokabularyo	<ul style="list-style-type: none"> • Pagbigay-kahulugan sa mga salitang ginamit sa teksto • Pagbigkas nang tama sa mga salitang ginamit sa akda • Pagpapabaybay sa mga salitang ginamit sa teksto • Pagbigay ng <i>clue</i> paano ginamit sa konteksto ang mga salita • Paghawan ng sagabal sa pamamagitan ng pagbibigay kahulugan
Paghahanap ng mga Tekstong Babasahin	<ul style="list-style-type: none"> • Pagkuha ng mga tekstong babasahin sa mga lumang aklat • Pagsaliksik ng mga tekstong babasahin sa <i>internet</i> o <i>online</i> • Pagbili ng mga mapagkukunan ng mga tekstong babasahin • Pagsangguni sa silid-aklatan ng mga tekstong babasahin • Paggamit ng <i>multimedia</i> na kagamitan sa pagpapabasa



Mga Pangunahing Tema at mga Idea Tungkol sa mga Posibleng Implikasyon sa mga Karanasan ng mga Guro sa Paggamit ng Metakognitibong Pagbasa sa Pagtuturo ng Filipino

Matapos masuri ang mga datos mula sa mga tugon ng mga partisipante sa ikatlong tanong na ano ang posibleng implikasyon sa mga karanasan ng mga guro sa paggamit ng metakognitibong pagbasa sa pagtuturo ng Filipino, isa-isang natukoy ang mga pangunahing idea.

Ang mga sinuring pahayag at mga kasagutan ng mga partisipante ay nakabuo ng mga pangunahing tema na: (1) magkaroon ng plano sa pagbasa; (2) magkaroon ng sapat na kaalaman sa paggamit ng metakognitibong pagbasa; (3) matukoy ang kakayahan sa pagpapabasa; (4) mahimok ang interes sa pagbabasa; (5) maipagpatuloy ang paggamit ng metakognitibong pagbasa; at (6) magkaroon ng angkop at sapat na mga tekstong babasahin.

Talahanayan 3

Mga Pangunahing Tema at mga Idea Tungkol sa mga Posibleng Implikasyon sa mga Karanasan ng mga Guro sa Paggamit ng Metakognitibong Pagbasa sa Pagtuturo ng Filipino

Mga Pangunahing Tema	Mga Pangunahing Idea
Magkaroon ng Plano sa Pagbasa	<ul style="list-style-type: none"> Magkaroon ng mga plano sa pagpapabasa Maging handa at may mga alternatibong gawain Tumugon sa layunin ng metakognitibong pagbasa Matutong pamahalaan ang oras sa pagbabasa
Magkaroon ng Sapat na Kaalaman sa Paggamit ng Metakognitibong Pagbasa	<ul style="list-style-type: none"> May sapat na kaalaman sa pagbabasa gamit ang metakognitibong pagbasa Alam paano matukoy o maintindihan ng mga mag-aaral ang binasa gamit ang metakognitibong pagbasa May hangarin na makapagbigay ng sagot at tugon sa problema gamit ang metakognitibong pagbasa Alam ang proseso bago at pagkatapos metakognitibong pagbasa Maging pursigido na makahanap ng paraan sa metakognitibong pagbasa
Matukoy ang Kakayahan sa Pagpapabasa	<ul style="list-style-type: none"> Masuri at matukoy ang kakayahan ng mag-aaral sa pagbabasa Magsagawa ng pagtataya upang masukat ang kakayahan sa pagbabasa Gamiting batayan ang mga resulta ng pagtataya sa pagbasa Mapaunlad ang kasanayan ng mga mag-aaral sa pagbabasa
Mahimok ang Interes sa Pagbabasa	<ul style="list-style-type: none"> May mga tekstong babasahin na nakaengganyo Bigyang-pansin ang kakayahan at hilig ng mag-aaral May maraming estratehiya ang gagamitin upang maging aktibo ang pagbabasa Bigyan ng mga gawain na makapagbahagi ng kanilang idea Kakitaan ng kolaboratibong pagbabasa
	<ul style="list-style-type: none"> Maipaunawa ang teksto sa pamamagitan ng patuloy na paggamit ng metakognitibong pagbasa



<p>Maipagpatuloy ang Paggamit ng Metakognitibong Pagbasa</p>	<ul style="list-style-type: none"> • Huwag mawalan ng pag-asa kapag hindi agad nakamit ang inaasahan gamit ang metakognitibong pagbasa • Habaan ang pasensya sa metakognitibong pagbabasa • Paunlarin ang kakayahan at paraan sa metakognitibong pagpapabasa • Makasali sa pagsasanay sa metakognitibong pagbasa ang mga guro
<p>Magkaroon ng Angkop at Sapat na mga Tekstong Babasahin</p>	<ul style="list-style-type: none"> • May maraming babasahing teksto na madaling unawain • May mga babasahin na kontekstuwalisado • May malinaw na mga tekstong gagamitin sa pagbasa • May mga tekstong babasahin na naglalaman ng mga impormasyon • Isinasaalang-alang ang mga babasahin na angkop sa metakognitibong pagbabasa • Mapamaraan sa paggamit ng tekstong babasahin.

Pangwakas na Pahayag

Bilang isang guro, ang pagtuturo ay nangangailangan ng sapat na kaalaman, pagpapalano, at epektibong estratehiya. Ang pagsasagawa ng pananaliksik ay nagbigay sa akin ng pagkakataon na masuri ang aking kakayahan at kahinaan sa larangan ng pananaliksik. Sa kabila ng mga hamon na aking hinaharap, nagkaroon ako ng positibong pananaw sa kahalagahan ng pagpapayabong sa kakayahan at kasanayan sa pagbasa, partikular sa asignaturang Filipino.

Matapos galugarin ang mga karanasan ng mga guro sa paggamit ng metakognitibong pagbasa, natuklasan ko ang mga kahirapan at hamon sa pagpapatupad nito. Sa pamamagitan ng pag-aaral, naging malinaw sa akin ang kahalagahan ng wikang Filipino at ang pagtangkilik dito ay mahalaga para sa pagpapalago ng pagkakakilanlan at ugnayan sa sariling wika.

Ang mga natuklasan sa pag-aaral na ito ay magsisilbing inspirasyon sa akin upang ipagpatuloy ang aking paglalakbay bilang tagapagturo. Sa pamamagitan ng pagpapakita ng positibong pananaw, pagtitiwala sa sarili, at patuloy na pagsusumikap, naniniwala ako na magtatagumpay ako sa aking mga layunin sa larangan ng edukasyon at pagpapalaganap ng wikang Filipino.

REKOMENDASYON

Ang mga temang nabanggit sa aking pananaliksik ay may mahalagang implikasyon sa pang-araw-araw na pagtuturo ng asignaturang Filipino sa antas ng senior high school. Natukoy ang mga kahirapan ng mga guro sa paggamit ng estratehiyang metakognitibo sa pagpapaunlad ng kakayahan sa pagbasa ng kanilang mga mag-aaral. Mahalaga na ang mga guro ay may sapat na kaalaman at kakayahan sa paggamit ng mga estratehiya sa pagbabasa upang mabawasan ang mga hamon sa pagtuturo.

Kailangan din ng mga guro na kilalanin ang kanilang mga mag-aaral, kasama na ang kanilang kakayahan at interes sa pagbabasa. Sa pamamagitan ng pagtukoy sa mga pangangailangan ng bawat mag-aaral, mas magiging epektibo ang pagpili at paggamit ng mga estratehiya sa pagtuturo ng pagbasa. Mahalaga rin ang pagkakaroon ng sapat at angkop na mga tekstong babasahin upang mapanatili ang interes at pag-unlad ng mga mag-aaral sa pagbasa.

Dagdag pa, mahalaga ang positibong pananaw ng mga guro sa patuloy na paggamit ng metakognitibong pagbasa bilang estratehiya sa pagtuturo. Ito ay magbibigay ng inspirasyon at pagpapalakas sa kanilang loob upang harapin ang mga hamon at patuloy na mapaunlad ang kanilang kakayahan sa pagtuturo ng Filipino.

Sa huli, inirerekomenda na magpatuloy ang mga mananaliksik sa pag-aaral at pagsusuri sa mga karanasan ng mga guro sa paggamit ng metakognitibong pagbasa. Ang mga resulta ng mga pag-aaral na ito ay maaaring magsilbing pundasyon para sa mas pinalalim na pag-unawa at pagpapaunlad ng estratehiyang ito sa pagtuturo ng Filipino.

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INTRODUCTION TO THE THEORY OF INTERTEXTUALITY: HYPERTEXTUALITY AND METATEXTUALITY FROM A DIFFERENT PERSPECTIVE

Riyad Abdurahman Manqoush, Ph.D

*Professor of English Literature,
English Language Department,
College of Arts & Languages,
Seiyun University, Yemen*

ABSTRACT

This essay centers on the theory of intertextuality which requires a critical analysis of the term “text”. The analysis of the intertextuality also leads to examining its two main modes – hypertextuality and metatextuality – and their types. The research paper ends up with the conclusion that intertextually as a theory and its modes – hypertextuality and metatextuality – and their different types are of quite significance for literary studies. This is because, as discussed in the study, they center on the text and they examine how texts are interrelated. This uncovers the similarities and interrelations that exist between texts.

KEYWORDS: *Intertextuality; hypertextuality; metatextuality; transposition; dissemination.*

1. INTRODUCTION

This essay is intended to elaborate on the theory of intertextuality. Although the real beginning of this kind of study refers to the “Saussurean and Bakhtinian theories of language and literature”, as Graham Allen (2000, p. 3) claims, “most people would wish to credit Julia Kristeva with being the inventor of ‘intertextuality’” (Allen, 2000, p. 11). This is because Saussure and Bakhtin did not make an obvious use of the word “intertextuality”. The theory of intertextuality focuses on the contents that connect a particular text to another. In fact, a good discussion of this theory requires a critical analysis of the term “text”. According to Julia Kristeva (1980), the “text” refers to the “trans-linguistic apparatus that redistributes the order of language by relating communicative speech, which aims to inform directly, to different kinds of anterior or synchronic utterances” (p. 36). This definition indicates that the text is not an invention; it is merely a reproduction or, as she claims, a redistribution of language. However, Michael Riffaterre (1980) argues that “the text refers not to objects outside of itself, but to an inter-text. The words of the text signify not by referring to things, but by presupposing other texts” (p. 228). Thus, the internal link exposes some clues for external elements. This argument indicates Riffaterre’s perception of the “text” is similar to Kristeva’s one that has been discussed previously and also her assertion in the excerpt below:

The text is therefore a productivity, and this means: first, that its relationship to the language in which it is situated is redistributive (destructive-constructive), and hence can be better approached through logical categories rather than linguistic ones; and second, that it is a permutation of texts, an intertextuality: in the space of a given text, several utterances, taken

from other texts, intersect and neutralize one another (Kristeva, 1980, p. 36).

Relating the “text” to the processes of “redistribution” and “permutation” shows that all texts are indeed “taken from other texts”. In other words, new texts are made of redistribution and reconstruction of others. Preoccupied with Kristeva’s intertextuality, Roland Barthes (1977) argues that the text is “a multidimensional space in which a variety of writings, none of them original, blend and clash” (p. 146). This argument indeed reinforces Kristeva’s claim that in which she (1980) argues that “any text is constructed as a mosaic of quotations; any text is the absorption and transformation of another” (p. 66) In other words, the text is rearranged and transposed to look like a new production. Even creative productions are written based on what authors love, read, watch, hear, feel, experience, imagine, or perhaps dream of. Barthes (1977) argues that any productive “text is made of multiple writings, drawn from many cultures and entering into mutual relations of dialogue, parody, contestation” (p. 148). Hence, texts are like melting pots in which many elements are used and mixed together to produce something new at the end.

Based on the previous discussions, Riffaterre (1994) claims that “intertextuality is a linguistic network connecting the existing text with other preexisting or future, potential texts” (p. 786). This is because, as Allen argues (2000), “texts and signs refer not only to the world or even primarily to concepts, but to other texts, other signs” (p. 115). Thus, “texts” are always dependent. This dependency reinforces Jay Bolter’s argument of the concept “association” in the excerpt below:

Association is always present in any text: one word echoes another; one sentence or paragraph recalls others earlier in the text and looks forward to still others. A



writer cannot help but write associatively: even if he or she begins with an outline and remains faithful to it, the result is always a network of verbal elements. The hierarchy (in the form of paragraphs, sections, and chapters) is an attempt to impose order on verbal ideas that are always prone to subvert that order. The associative relationships define alternative organizations that lie beneath the order of pages and chapters that a printed text presents to the world. These alternatives constitute subversive texts-behind-the-text (Bolter, 1992, pp. 109-110).

Based on this quotation and also the previous discussions, one can claim that intertextuality exists because “writers” are influenced by other “texts” or perhaps external elements. This argument indeed underpins what has been elucidated earlier that all texts, even the good ones, are intertextual. For instance, Ibn Tufay’s *Hayy ibn Yaqzan* (d.1185), Kipling’s *The Jungle Book* (1894) and Burroughs’ *Tarzan of the Apes* (1914) have similar themes. The three novels centre on a child being brought up by animals. Hence, texts cannot dispense with each other. Allen (2000) recapitulates the earlier discussions when he argues that “texts, whether they [are] literary or non-literary, are viewed by modern theorists as lacking in any kind of independent meaning. They are what theorists call intertextual” (p. 1) This is indeed the essence of the meaning of the intertextual theory. Relatively, the four novels selected for this study cannot completely be understood without denoting historical events such as the 9/11 attacks and the US occupation of Iraq. This is because the four stories are built on the ruins of that history.

Texts are always in dialogues with other texts. In her analysis of these dialogues, Kristeva (1980) distinguishes between a “horizontal axis (subject-addressee) and vertical axis (text-context)” (p. 66). The former refers to the dialogical relationship between the reader and writer. And the latter refers to the internal and external relationships in the text. Kristeva (1980) claims that “these two axes” have been discussed by Bakhtin under the names of “*dialogue* and *ambivalence*”, but these two concepts “are not clearly distinguished” (p. 66). Hence, she disseminates them under the name of “horizontal axis” and “vertical axis” (Kristeva, 1980, p. 66). Kristeva’s two axes consist of “three dimensions or coordinates of dialogue [that] are writing subjects, addressee, and interior texts” (Kristeva, 1980, p. 66). In other words, they are the writer, reader, and the text. She elaborates that “the word’s status is thus defined *horizontally* (the word in the text belongs to both writing subject and addressee) as well as *vertically* (the word in the text is oriented towards an anterior or synchronic literary corpus)” (Kristeva, 1980, p. 66). While the former focuses on the linkage between the author and the reader, the latter stresses on the coherence between the text and other external texts, or as argued earlier, the dialogue that exists among the different texts. This dialogue has been elaborated by Kristeva (1980) in the excerpt below, but under the name of “ideologeme”:

The ideologeme is the insertion of a given textual arrangement (a semiotic practice) with the utterance

(sequences) that it either assimilates into its own space or to which it refers in the space of exterior texts (semiotic practices). The ideologeme is that intertextual function read as “materialized” at the different structural levels of each text, and which stretches along the entire length of its historical and social coordinates. This is not an interpretive step coming after analysis in order to explain “as ideological” what was first “perceived” as “linguistic.” The concept of text as ideologeme determines the very procedure of a semiotics that, by studying the text as intertextuality, considers it as such within (the text of) society and history. The ideologeme of a text is the focus where knowing rationality grasps the transformation of utterances (to which the text is irreducible) into a totality (the text) as well as the insertions of this totality into the historical and social text. (pp. 36-37).

As discussed above, Kristeva argues that the text is always in dialogue with the world outside it. The term “ideologeme” does not only indicate that “texts” can reflect “other texts”, but can also mirror “history”, culture, or any external elements. The concepts of “arrangement”, “interpretation” and “transformation” that are involved in this relation will be discussed in detail when I scrutinise the modes of intertextuality.

G rard Genette (1997) has further developed this theory but he utilises the term “transtextuality” as an alternative of intertextuality (p. 1). He relates transtextuality to “all that sets the text in a relationship, whether obvious or concealed, with other texts” (Genette, 1997, p. 1). He also relates transtextuality to the “relationship of copresence between two texts or among several texts: that is to say, eidetically and typically as actual presence of one text within another” (Genette, 1997, p. 1). By making a comparison between Genette’s definition of “transtextuality” and the earlier discussions of Kristeva, Barthes, Riffaterre, Bolter and Allen, one can obviously notice that Genette’s “transtextuality” is merely a synonym of “intertextuality”. However, Genette’s contribution for this theory is undeniable for he has coined a number of concepts that assist critics to examine the internal operations of intertextuality. For instance, the “hypertextuality” and “metatextuality”, which will be discussed further under the subheading “modes of intertextuality”, are his coinage.

2. BACKGROUND OF INTERTEXTUALITY

Before analysing the different modes of intertextuality, I need to elaborate on some concepts that are viewed as traditional types of intertextuality such as plagiarism, quotation, citation, translation, reduction, excision, and expurgation. Among these concepts, plagiarism seems to be the most problematic one. This is because it is classified as a type of larceny. In other words, “in its more explicit and literal form, it is the traditional practice of *quoting* ... without specific references. In another less explicit and canonical form, it is the practice of *plagiarism*” (Genette, 1997, p. 1). Writers may rewrite a complete or part of a work which has already been written by



others. However, this type of intertextuality mostly occurs among student at schools and universities more than writers of literature.

Unlike plagiarism, the use of quotation and citation is legal because the new text does not claim the possession of what has been quoted from the original text. According to Genette (1997), the quotation refers to “the traditional practice of *quoting* with quotation marks” (p. 1). These “marks” confirm that the intertext is quoted and the new text can also mention the reference such as the writer’s name and the work’s title. In fact, the use of quotation reinforces what has been discussed earlier where Kristeva (1980) argues that “any text is constructed as a mosaic of quotations.” (p. 66) In addition to that, Barthes (1981) claims that “any text is a new tissue of past citations. Bits of code, formulae, rhythmic models, fragments of social languages, etc., pass into the text and are redistributed within it, for there is always language before and around the text” (p. 39). Thus, both theorists expose that the practice of “quotation” and “citation” is normal and it can exist in “any text”.

Translation is another traditional type of intertextuality in which the original text is supposed to be presented in another language. Translation can also be partial when writers derive parts of their works from foreign texts. In general, this type of intertextuality can mostly be influenced by the ideology of the translator. Horst Frenz (1973) alleges that the translator can deform “a literary work and thus becomes responsible for presenting an idea or point of view or a mood which was actually not expressed by foreign writer” (p. 105). Therefore, critics must have adequate knowledge of the original text in order to deconstruct any distorted translation.

Texts can sometimes be excised and reduced purposely. Allen (2000) argues that “excision and reduction might make us think of what in Britain are known as bowdlerized versions of texts, versions of Shakespeare or popular novels which Victorian publishers often published minus the ‘sexy’ or

religiously controversial bits” (p. 109). Similarly, the current Arabic text of *One Thousand and One Nights* that is available in Arabic book-stores does not contain many of the depraved descriptions which the original text has. In fact, elements of original texts can be obliterated or reduced in their new versions with the aim of conforming to the traditions, religion, or even political system of a certain nation.

In addition to that, expurgation and the “self-expurgation” is the process “in which the author himself produces a censored version of his own work” (Genette, 1997, p. 235). This expurgation is done for the purpose of improving a certain work. As a way of making the self-expurgation palpable, one can refer to the example discussed by Allen which shows Thomas Hardy’s self-expurgation of his *Tess of the D’Urberville* which was firstly published in 1891 and then “was finally published in 1912” as *Alec D’Urberville* (Allen, 2000, p. 109). As an example of these expurgations in the novel, Allen (2000) claims that “in order to conform to the expectations of the late-Victorian audience of *The Graphic* Hardy had to alter his narrative so that Tess, instead of being raped by *Alec D’Urberville*, goes through a fake marriage with him” (p. 109). In fact, “*The Graphic*” is the name of “the literary magazine” that published his novel (Allen, 2000, p. 109). As seen in the discussions of Genette and Allen, both merely emphasise on the process of “expurgation” that is performed by the work’s author. Therefore, they call it “self-expurgation”. Anyhow, expurgation can also be practised by people other than the author of the work.

3. MODES OF INTERTEXTUALITY

In fact, the traditional types of intertextuality are simple and normally used by people without realising that they are using intertextuality. In this section, I will explain different types of intertextuality which are more complicated. These types or modes are categorised into two main concepts, hypertextuality and metatextuality, as explicated below:

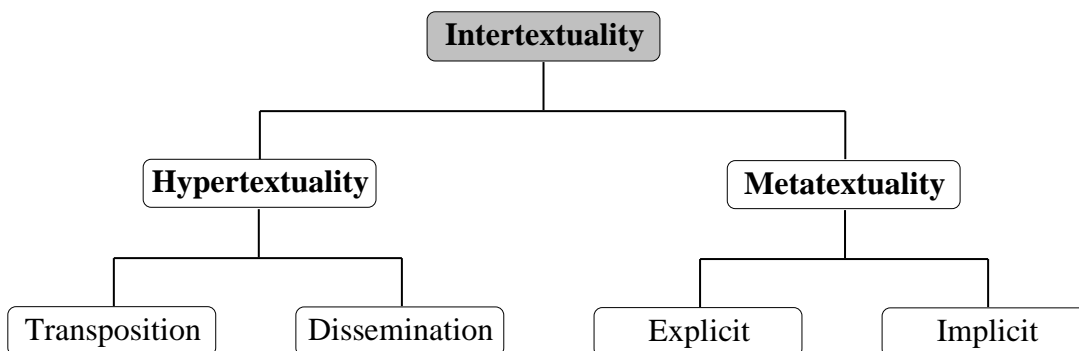


Figure 1: Modes of Intertextuality

As seen in the diagram, historical intertextuality occurs in literature through different modes. These modes are divided either as hypertextuality or metatextuality. In addition to that,

hypertextuality and metatextuality have their own subtypes as well. For instance, hypertextuality is categorised into transposition and dissemination. In contrast, there are two



types of metatextuality—explicit and implicit. Above all, these four concepts have their own strategies as will be discussed further.

3.1. Hypertextuality

Before analysing hypertextuality, a brief discussion of the term “hypertext” that is used in computer science can be of assistance. This is because theorists like Barthes, Genette and Riffaterre had derived the same term and applied it to literature. In fact, the beginning of the term “hypertext” is related to Theodore Nelson in 1965 (Bolter, 1992, p. 105). Theodore Nelson (1987) utilises the word “hypertext” to refer to a “fully non-sequential writing, a branching text that allows the reader to make choices; it is something that can be best read in front of an interactive screen” (p. 2). For instance, internet surfers experience this interactivity when they choose the links to take them to other pages or websites. In other words, the “hypertext” is the “forms of writing that reflect the structure of what we write about; and the readers can choose different paths according to their attitudes and the stream of their thoughts, in a way until now believed to be impossible” (Nelson, 1987, p. 3). By the same token, George Landow elaborates that the “hypertext” is used in computer science as an alternative of the concept “hypermedia”:

Hypermedia simply extends the notion of the text in hypertext by including visual information, sound, animation, and other forms of data. Since hypertext, which links one passage of verbal discourse to images, maps, diagrams, and sound as easily as to another verbal passage, expands the notion of text beyond the solely verbal, I do not distinguish between hypertext and hypermedia. Hypertext denotes an information medium that links verbal and nonverbal information. In this network, I shall use the terms hypermedia and hypertext interchangeably (Landow, 1992a, p. 3).

As seen above, the “hypertext ... links one passage of verbal discourse to images, maps, diagrams, and sound as easily as to another verbal passage, expands the notion of text beyond the solely verbal.” This example seems to be unclear because it centres merely on internal computer relationships. However, Bolter has illustrated the above relation with regard to books, not computers. As he explicates, the “hypertext consists of topics and their connections, where again the topics may be paragraphs, sentences, individual words, or indeed digitized graphics” (Bolter, 1992, p. 111). In more obvious words, the “hypertext is like a printed book that the author has attacked with a pair of scissors and cut into convenient verbal sizes” (Bolter, 1992, p. 111). The previous discussions that emphasised on the use of hypertext in computer science and the examples given on the hyperlinks in computer programs and internet has invoked Barthes (1982) to argue that “a hypertext document system allows authors or groups of authors to link information together, create paths through a corpus of related material, annotate existing texts, and create notes that point readers to either bibliographic data or the body of the referenced text” (p. 17). In other words, Barthes has appropriated the hypertext used in computer to literary theory.

Although the insertion of the term “hypertext” in literary studies is related to Barthes, Genette (1997) has conceptualised “hypertextuality” to denote “any relationship uniting a text B (which I shall call the *hypertext*) to an earlier text A (I shall, of course, call it the *hypotext*), upon which it is grafted in a manner that is not that commentary” (p. 5, brackets and italics original). Therefore, a good comprehension of hypertextuality requires a sufficient knowledge of the hypertext and hypotext. In this research, I utilise the four novels as “hypertext” and the history mirrored in their contexts is referred to as the “hypotext”. Riffaterre (1994) argues that “hypertextuality is derived from the text in a concerted effort to approximate the sum total of the ideas, of the descriptive and narrative sign-systems, of the thematic material the text has appropriated to its own purposes, and, finally, of the text’s social, cultural, and historical backgrounds” (p. 786). This indicates that the hypotext can be another text, history or probably culture. This has similar the comparative literature, and particularly the interdisciplinary approach that highlights the intertextual association between literary texts and other disciplines such as history, culture, and science.

Hypertextuality can apparently be differentiated from metatextuality and other types of intertextuality by a number of features. I have discussed earlier that the hypertextual cohesion is normally “explicit” but not “commentary”. This is because it does not have a critical purpose like metatextuality. In addition to that, Allen (2000: 108) explains that hypertextuality is an “intentional” and “conscious” form of intertextuality as can be seen below:

What Genette terms the *hypotext* is termed by most other critics the *inter-text*, that is a text which can be definitely located as a major source of significance for a text. In this sense, Homer’s *Odyssey* is a major inter-text, or in Genette’s terms hypotext, for Joyce’s *Ulysses*. In his use of hypertextuality Genette particularly refers to forms of literature which are intentionally inter-textual ... Genette’s concern is with intended and self-conscious relations between texts. Hypertextuality marks a field of literary works the generic essence of which lies in their relations to previous works. (p. 108).

Thus, I can now define “hypertextuality” as a “conscious” and “explicit” relationship between two texts or more where the relationship is not loaded with a “commentary” or critical objectives, unlike metatextuality that will be discussed further pages of this paper.

Although hypertextuality has been discussed by a few scholars, other theorists have implicitly and unconsciously dealt with some of its aspects. This will be exposed in this section where I analyse the hypertextual concepts. As an attempt to make the internal operations of hypertextuality clearer, I have restructured it into two main types: hypertextual transposition and hypertextual dissemination:



a. Hypertextual Transposition

Hypertextuality can refer to the “transposition” of some elements of the hypotext in the hypertext. In fact, I have derived the term “transposition” from Kristeva’s discussions of intertextuality in the excerpt below:

We shall call *transposition* the signifying process’ ability to pass from one sign system to another, to exchange and permutate them; and representability the specific articulation of the semiotic and the thetic for a sign system. Transposition plays an essential role here inasmuch as it implies the abandonment of a former sign system, the passage to a second via an instinctual intermediary common to the two systems, and the articulation of the new system with its new representability. (Kristeva, 1984, p. 60).

Kristeva’s elaboration on “transposition” indicates that her concept has the same meaning of Allen’s “rearrangement”. Allen (2000) argues that “a text’s meaning is understood as its temporary rearrangement of elements with socially pre-existent meanings. Meaning, we might say, is always at one and the same time ‘inside’ and ‘outside’ the text” (p. 37). Hence, writers seem not to invent something original and their “only power is to mix writings, to counter the ones with the others, in such a way as never to rest on any one of them” (Barthes, 1977, p. 146). This means that they merely use the information, which they got from other written or non-written texts, and reorder it in a particular way to make it appear like a new production.

b. Hypertextual Dissemination

The concept “dissemination” has been stressed in critical theory after Jacques Derrida published an essay under its name in *Critique* in 1969 (Derrida, 1981, p. 287). The core of Derrida’s argument is that the “hermeneutic concept of *polysemy* ... must be replaced by *dissemination*” (Derrida, 1981, p. 262). Derrida (1981) indicates that “the concept of polysemy thus belongs within the confines of explanation, within the explication or enumeration, in the present, of meaning. It belongs to the attending discourse. Its style is that of the representative surface” (p. 262). Based on that, the concept “dissemination” can mean “explanation”, explication” and “enumeration”.

Barthes (1977) claims that “the Text is not a co-existence of meanings but a passage, an overcrossing; thus it answers not to an interpretation, even a liberal one, but to an explosion, a dissemination” (p. 159). Yet, “dissemination” is used by Barthes to mean the process of extending the hypotext in the hypertext. Barthes (1977) also emphasises on the concept of “dissemination” when he argues that “one would need to pursue the present study, to pursue the reading of the text – its dissemination” (p. 141). I can now claim that the “dissemination” is a type of hypertextuality in which the hypertext explains, illustrates, or expands the hypotext.

3.2. Metatextuality

One can easily realise that there is a link between metatextuality and other concepts such as metafiction, metahistory, metalanguage, metaanalysis, and also

metacriticism. One of the reasons is because they all share the use of the prefix “meta”. This prefix is Greek in origin and means “beyond”, “above”, “over” and also “about” (Pape, 2008, p. 3; Popham, 2008, p. 18). I will analyse one of the concepts above, particularly metafiction, to expose what the prefix “meta” added to its meaning. This discussion can be of a great assistance in understanding what is meant by metatextuality. The term “metafiction”, which was coined by William H. Grass in 1970, means “fiction about fiction: or more especially a kind of fiction that openly comments on its own fictional status ... the term is normally used for works that involve a significant degree of self-consciousness about themselves as fictions” (Baldick, 1990, p. 133). Thus, “metafiction” refers to a literary text that is written about another. It is called metafiction because it is consciously or unconsciously written “over” and “about” another fiction. As an example of the metafiction, Robert Stam and Alessandra Raengo in the quotation below expose a number of literary works that criticise, oppose or provide different perspectives of other narratives:

Jean Rhys’s *The Wide Sargasso Sea* (1966) retells Charlotte’s *Jane Eyre* as the story of Bertha Mason, Mr Rochester’s first wife and the by-now-celebrated “madwoman in the attic” of feminist criticism, leading us to reassess the racialized presentation of Bertha as a “creole savage.” ... Another recent trend within literature involves the rewriting of a novel from the perspective of secondary or even imaginary additional characters. Thus we get *Robinson Crusoe* rewritten from the perspective of Susan Barton (Coetzee’s *Foe*), *Moby Dick* from the perspective of the wife of Captain Ahab (Sena Naslund’s *Ahab’s Wife*), *Lolita* from the perspective of Lolita (Pia Pera’s *Lo’s Diary*), *Don Quixote* from the perspective of a female Quixote (Kathy Acker’s *Don Quixote*). Here the possible permutations become endless, since any novel could be written from the perspective of a different character: an ecological rewriting of *Moby Dick* might give us Captain Ahab from the point of view of the whale (Stam and Raengo, 2005, p. 29, italics and brackets original).

These literary works ironise and parodise other earlier literary works. To summarise the previous discussions, “metafiction” is a critical use of fiction; “metahistory” is a critical use of history and the same with “metalanguage”, “metaanalysis” and metacriticism”. However, a problem appears in the terminology because the meaning of metafiction is only restricted to fiction. Similarly, metahistory is limited to history and also the same with metalanguage, metaanalysis and metacriticism. Thus, hundreds of terms might appear, using the prefix “meta”, to reflect the same meaning. To overcome this duplication, Genette has coined the term “metatextuality” to recapitulate any “commentary” and critical “relationship” between any two texts. He argues that the “*metatextuality* ... unites a given text to another, of which it speaks without necessarily citing it (without summoning it), in fact sometimes without naming it” (Genette, 1997, p. 4, italics and brackets original). Since any meta’s relation can briefly be identified as metatextuality, concepts such as metafiction, metahistory,



metalanguage, metaanalysis and metacriticism will be included in that metatextuality.

Metatextuality sheds light on various “commentary” texts which are called “metatexts”. According to Randal Holme (2004), the “metatext is the use of text to comment upon itself, or to explain what it is saying” (p. 49). In other words, it is a text that criticises another. Relatively, Genette (1992) illustrates that “all literary texts critics, for centuries, have been producing metatext without knowing it” (p. 82). This illustration coincides with Holme’s argument that “students of academic writing may not be fully aware of how the way they cite a given authority may construct the view that they have of it. Such terms belong to what is called *metatext*” (Holme, 2004, p. 49). This is because their writings normally reflect opinions about the texts they use. If it is not explicit critical analysis, it can be implicit criticism.

There are two types of metatextuality—explicit and implicit. In fact, I have derived this division from the discussions of a number of scholars. Stam and Raengo (2005) relate metatextuality to “the critical relation between one text and another, however the commented text is explicitly cited or silently evoked” (p. 28). The use of the words “explicitly” and “silently” is also repeated by Daniel Chandler (2007) who argues that “metatextuality” refers to the “explicit or implicit critical commentary of one text on another text” (p. 206). By the same token, Holme (2004) indicates that the “metatext provides an implicit and explicit opportunity for the writer to give their own view on what they are saying” (p. 49). All these scholars indicate that there are two types of metatextuality. However, those scholars have merely centred on explicit and implicit metatextuality in general; they have not exposed their internal operations. In my attempt to clarify this point, I shall highlight the characteristics and strategies that are used in any explicit or implicit metatextuality.

a. Explicit Metatextuality

From the word “explicit”, one can realise that this type of metatextuality indicates an obvious and direct commentary relation between two particular texts or more. Explicit metatextuality is similar to hypertextuality in its explicitness and consciousness; but it departs from it in its critical intention.

b. Implicit Metatextuality

This type of metatextuality is always indirect because it is mostly achieved through the use of allusion. Therefore, analysing the implicit metatextuality cannot be performed without understanding the concept of “allusion”. According to Michael Leddy (1992), allusion refers to “words [that] typically describe a reference that invokes one or more associations of appropriate cultural material and brings them to bear upon a present context” (p. 112). In other words, these “words” have double meanings, overt and covert. The former implicitly deals with the obvious “context”. In contrast, the latter is ambiguous and refers to the “associations” that allude to elements outside the text. This is because some texts can apparently refer to traces of earlier texts. Reinforcing this

claim, Kristeva (1980) elaborates that “within the interior space of the text as well as within the space of the *texts*, poetic language is a ‘double’” (p. 69). This “double” and ambiguous meaning distinguishes allusion from other types of intertextuality such as hypertextuality and explicit metatextuality. It also makes the analysis of allusion subjective. To avoid this subjectivity, critics must prove their arguments by denoting other evidences from the same text or even outside it.

Just like Leddy, Genette (1997) relates the word “allusion” to “an enunciation whose full meaning presupposes the perception of a relationship between it and another text, to which it necessarily refers by some infections that would otherwise remain unintelligible” (p. 2). This “enunciation” can be a word, a phrase, a sentence or maybe a complete paragraph. As seen in the excerpt above, Genette’s perception of allusion is similar to Leddy’s which have been discussed earlier. He merely elaborates that knowing the “infections” of the old text on the new text can assist the reader’s understanding. However, William Irwin (2001) criticises Leddy’s use of the word “typical” and claims that the “additional associations are more than just typical; they are necessary for correct and complete understanding” (p. 288). According to Irwin (2001), allusion is:

A reference that is indirect in the sense that it calls for associations that go beyond mere substitution of a referent. Allusions often draw on information not readily available to every member of a cultural and linguistic community, are typically but not necessarily brief, and may or may not be literary in nature. (p. 289).

This quotation reinforces my earlier discussions that the “indirect” “associations” make the allusion more ambiguous if compared to hypertextuality or explicit metatextuality. It also indicates that the reader’s interference is needed to complete his/her understanding of the text. Consequently, John Campbell (1994) argues that “allusions invite us to select from our mental library, knowledge which is not in the text itself and without which the writer’s intention will not be fully communicated” (p. 19). However, the role of the reader can distort the meaning of the text when the reader is subjective or biased. Therefore, although Irwin (2001) “cannot deny that the reader must play a vital role in his or her own understanding of an allusion”, he insists that the reader’s “understanding” “must be in accord with the author’s intent” (p. 293). In other words, when readers claim that a particular text alludes to another, evidence must be provided and proved. This coincides with the discussions of Allan Pasco (2002) who explains that “when allusion is unnoticed or misunderstood, the blame should fall on readers rather than on writers and their occasional use of covert allusion” (p. 10). Thus, readers must be aware of the double meaning employed in texts.

Though many discussions have been done on allusion, few of them have emphasised on its types. According to Pasco (2002), there are “parallel and oppositional allusions” (p. 110). The former refers to allusions that parallel pre-existed texts and affirm some notions that coincide with the standpoint of



its writer. This type of allusion will be avoided in my discussion here because it is irrelevant to metatextuality. The latter refers to the allusions which counter and oppose another text. In fact, the strategies of implicit metatextuality which will be discussed further are similar to what Pasco calls “oppositional allusion”. According to Pasco (2002), “an allusion of opposition may weight parallels as a means of preparing a contrasting conclusion” (p. 103). In other words, text B can employ some elements of text A in a way to expose an opposition or a refusal of its contents. Pasco (2002) argues that “allusion of opposition has been virtually ignored ... [because] allusions of opposition present particular difficulties, however, for their ironies and paradoxes usually bring nuances of extraordinary complexity to bear on some aspect of the created world” (p. 98) Although Pasco is correct in his emphasis on the concept of “complexity”, oppositional allusion does not merely utilise ironies and paradoxes. Parody is also used in a great number of works to show an opposition to another text. In brief, oppositional allusions or implicit metatextuality can occur through irony, paradox, or parody.

4. CONCLUSION

Intertextually as a theory and its modes — hypertextuality and metatextuality — and their different types are of quite significance for literary studies. This is because, as discussed in the study, they center on the text and they examine how texts are interrelated. This uncovers the similarities and interrelations that exist between texts.

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ANALYSIS OF RAINFALL TREND USING NON- PARAMETRIC METHODS AND INNOVATIVE TREND ANALYSIS TECHNIQUE DURING 1901-2019 IN ODISHA

Mr. Suraj Kumar Behera

Guest Lecturer in PG Department of Geography, MPC Autonomous College, Takhatpur, Baripada, Odisha;suraj.

ABSTRACT

Annual Rainfall, has received a great deal of attention worldwide by researchers. The degree of variability or fluctuations in the factor varies according to locations. Hence, examining the trend of rainfall in Odisha state where agriculture plays a vital role in the state's economy, which depends on monsoonal rainfall. Any change in rainfall pattern can adversely affect the agricultural production and economy of Odisha. This study examines the long-term changes and short-term fluctuations in annual and seasonal rainfall in the state of Odisha. The study analyzed the rainfall data for a period of 119 years (i.e. 1901–2019) as a whole and also at the micro scale for the state of Odisha. It used the statistical trend analysis techniques, namely Mann-Kendall (MK) test, and Sen's slope estimator and Regression line for examining the trend direction and magnitude of the change over the study period. The observed variation in rainfall at different scales revealed that, the monsoon season has maximum contribution to annual rainfall and it does not have any strong trend over the study period. The outcomes of the study gives district-wise information on rainfall trends on a long-term basis, which will be helpful for the Hydrological resources department for planning and management of hydrological resources for its sustainable use and particularly for the benefits of agricultural sectors.

KEYWORDS: Rainfall Trend Analysis, Mann-Kendall (MK) test, Sen's Slope Estimator Test, Regression Technique.

INTRODUCTION

The changes in rainfall have caused changes in intensity and frequency of climate events such as droughts and floods, which have a great impact on human life and socio-economic features of India (Janadas and Ambuja, 2019). According to the report of the Intergovernmental Panel on Climate Change (IPCC), Precipitation is the most significant factors in the list of climatic variables, commonly used to trace the level and magnitude of climate change and variability (IPCC, 2007). According to other Researchers, rainfall (Singh et al., 2013) is the most essential physical parameters among the climatic variables. These variable regulate the environmental condition of a particular area which affects the agricultural production of that region (Modarres and da Silva, 2007; Kumar and Gautam, 2014). On the other hand the increasing demographic pressure and variation in climate exaggerated the concern for the availability of usable and drinkable freshwater resources (Vorosmarty et al., 2000; Gleick, 1993, 2000; Shiklomanov et al. 2003; Milliman et al., 2008). According to the study of Chaouche et al. (2010), some region is very much sensitive to the results of climate change. According to some researchers, the rising pressure of humans on the land-use pattern is the major cause of extreme weather and change in climatic parameters like rainfall (Alcamo et al. 2003; Arnell et al., 2004).

Odisha has primarily an agriculture-based economy. It contributes nearly 30% to the Net State Domestic Product (NSDP) and about 73% of people engaged in this sector

(Planning commission 2001). The agricultural area of Odisha is about 61.80 lakh hectares, about 54% of cultivable land has an irrigation facility (Odisha agriculture statistic report, 2014). Therefore, natural rainfall plays a most significant role in Odisha's economy in agriculture.

According to the Odisha state disaster management authority, Droughts are also being experienced by Odisha each year in some regions or the other. During the last 50 years, natural events have affected the state for 41 years out of which drought had hit 19 years. Abnormal rainfall is the most significant factor for severe drought condition in Odisha. The monsoon rain that comes at the end of the October and its pattern does not benefit the state's agriculture activity. Thus, there is an urgent need to pay proper attention to the variation of rainfall as it affect the availability of fresh water and agricultural production (Dore, 2005).

Therefore, the major aim of this study or research is to analyze the Trend of the Rainfall of Odisha. Annual and seasonal trends of rainfall have been studied in this research. The prime objective is to explore the trend in rainfall of Odisha during 1901-2019 at district level. The specific objectives are to analyze the trends of rainfall on an annual and seasonal by using non-parametric test and trend of rainfall by Regression line. Here, we compare the two technique data of trend analysis. In this study, we can get knowledge about the rainfall trend.

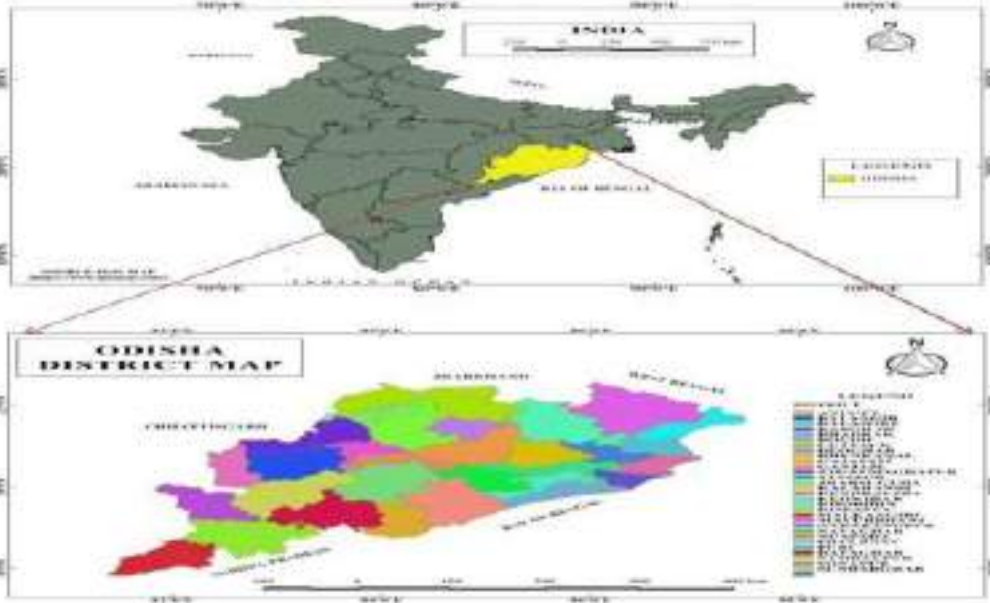


STUDY AREA

Odisha coastal state lies in the north-eastern part of the Indian Peninsula with 450 km long coastline. The Odisha state comprises 30 districts and covers an area of 1,55,707 sq. km, making it the 9th largest state in the country in terms of area and it is 4.87% of India's whole geographical area.

The Odisha state is coming from a tropical climate. Odisha states observed high temperature, high humidity, about 200cm rainfall varies from medium to high, and short, minor winters. The south-west monsoon comes in between 5th June and

10th June in the coastal area of Odisha. Odisha receive 1451.2 mm of normal rainfall. About 75% to 80% of rainfall is received during the Monsoon season from June to September. The part of the cropped area of Odisha under different crops has increased from 42.37% to 43.79% in 2014-15 to 2018-19, respectively. About 61 lakh hectares of irrigation potential were created in 2018-19 compared to 51.8 lakh hectares in 2014-15. In Odisha, more than 83% of the total population lives in rural areas and depends on the primary activity, i.e. agriculture. Water-consuming rice is its main crop, which needed 200cm of rainfall for cultivation.



DATA AND METHODOLOGY

Rainfall data of Odisha from 1901 to 2019 for 119 years is considered for analysis of trend of rainfall. These data have been obtained from the India Water Portal and State Relief Commission of Odisha. The study is based upon secondary data sources which are freely available by these organizations. The monthly rainfall data were collected district-wise and categorized into four seasons such as: Winter Season (Jan-Feb), Pre-Monsoon Season (March-May), Monsoon Season (June-Sept), Post-Monsoon Season (Oct-Dec). Statistical methods, such as regression analysis (Deshmukh,2013) is used. The non-parametric tests such as the MK test and Sen's Slope estimator test (is done by using XLSTAT 2014 software) have been used in this study for trend analysis. In this study, we can show the trends of rainfall by using two techniques.

DATA ANALYSIS TECHNIQUE

The MK test is a statistical non-parametric test widely used for trend analysis in climatological and hydrological time series

data. This non-parametric test was suggested by Mann (1945) and has been widely used in climatological and environmental time series analysis. The two main advantages of using this non-parametric statistical test is:-the first are It is a nonparametric test, so it does not require whether the data is normally distributed or not and the second is due to inhomogeneous time series, the test has low sensitivity to abrupt breaks. The MK test is also more suitable for the outlier, censored, and missing data of the series.

The magnitude of a trend in a time series can be determined using a non-parametric method known as sen's slope estimator (sen,1968). To estimate the true slope of an existing trend, such as the amount of change per year,we use this statistical test.

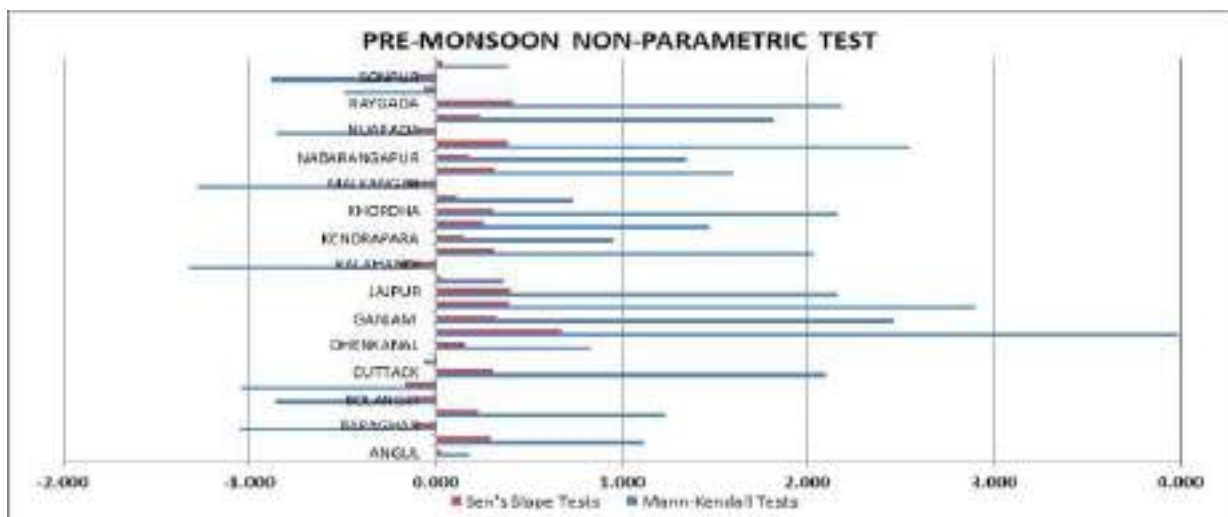
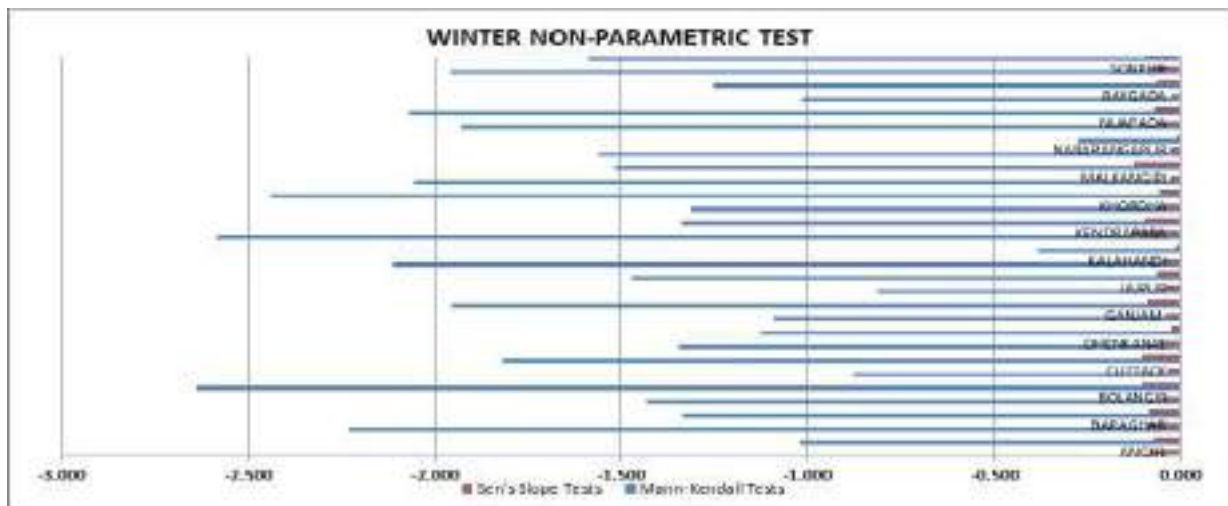
The trends of Seasonal and Annual Rainfall of Odisha over different years were obtained using Linear Regression best fit lines. In the Regression equation positive "Y" values show an increase in rainfall and negative "Y" values indicate a decrease in rainfall.

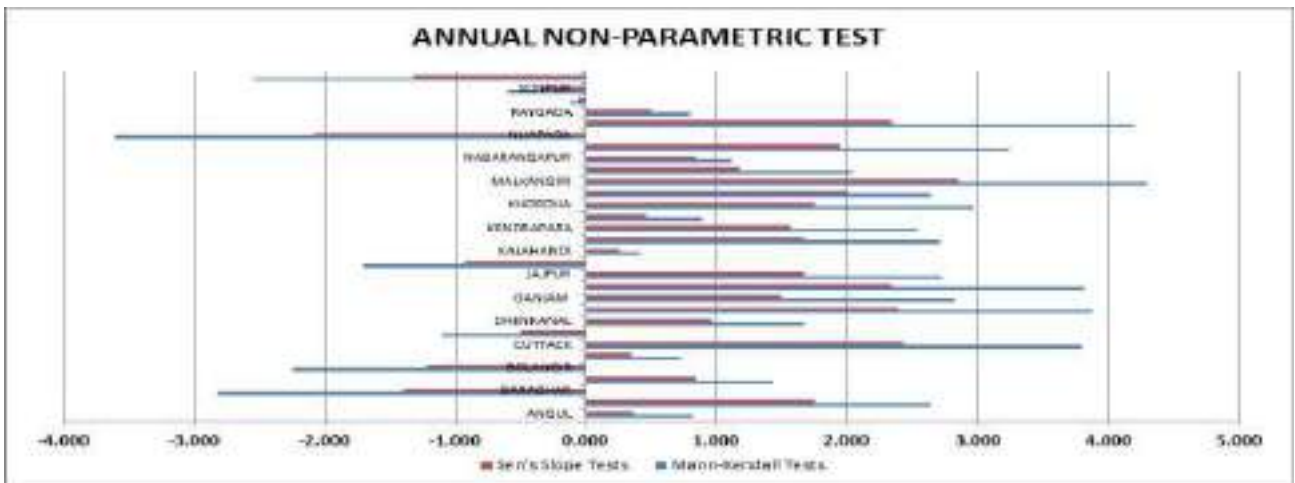
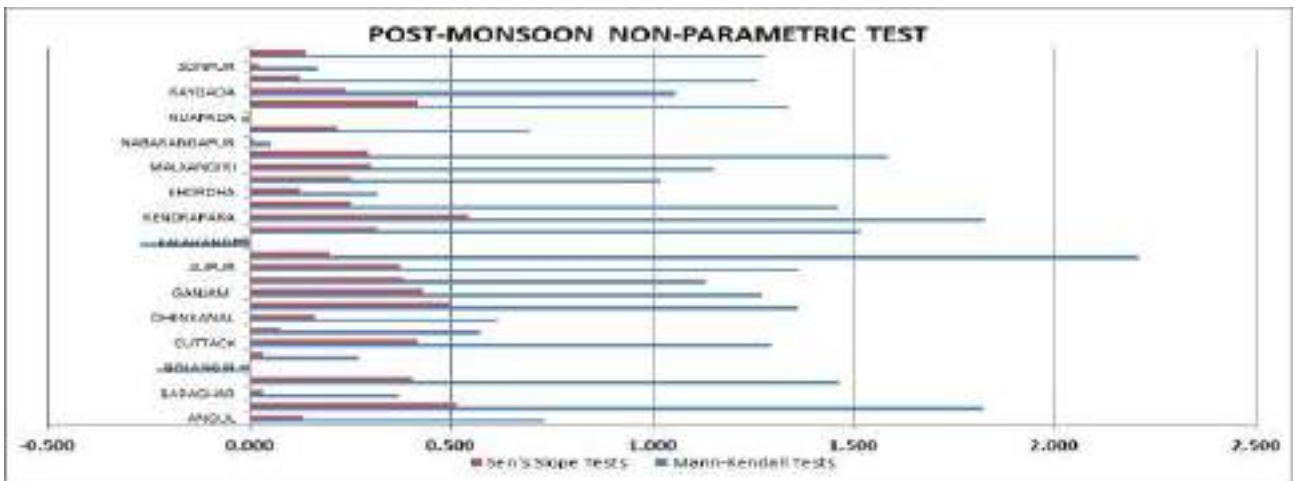
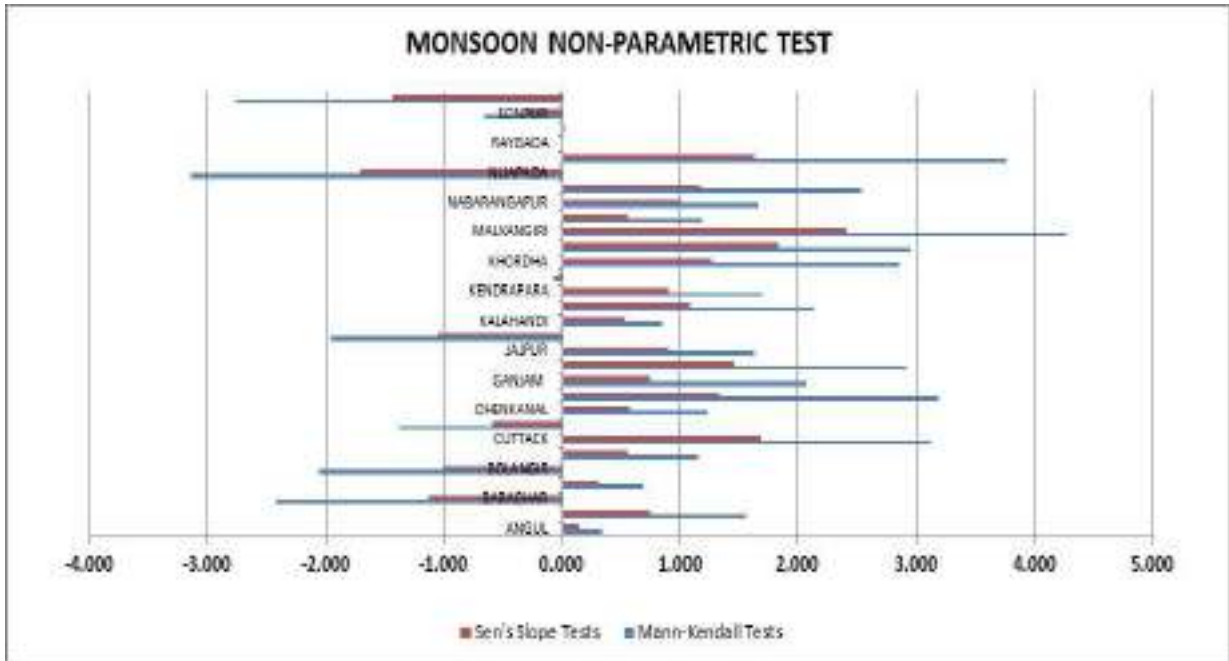


RESULTS AND DISCUSSION

a. Trend Analysis using Non-Parametric tests

DISTRICT	ANNUAL			WINTER			PRE-MONSOON			MONSOON			POST-MONSOON		
	P value	MK test	Sen's slope	P value	MK test	Sen's slope	P value	MK test	Sen's slope	P value	MK test	Sen's slope	P value	MK test	Sen's slope
ANGUL	0.4189	0.825	0.3544	0.1580	-1.412	-0.0771	0.8397	0.177	0.8907	0.7342	0.340	0.1418	0.4632	0.736	0.1323
BALASORE	0.0082	2.642	1.7504	0.3082	-1.010	-0.0597	0.2642	1.116	0.2024	0.1203	1.554	0.7523	0.8682	1.824	0.513
BARAGHAR	0.0048	-2.819	-1.3934	0.0257	-2.231	-0.0882	0.2910	-1.056	-0.1173	0.0156	-2.419	-1.1388	0.7115	0.370	0.034
BILADRAK	0.1519	1.433	0.8475	0.1826	-1.333	-0.0648	0.2177	1.233	0.2310	0.4912	0.688	0.311	0.1428	1.465	0.4056
BOLANGER	0.0249	-2.242	-1.2107	0.1526	+1.430	-0.0453	0.3895	-0.861	-0.0913	0.0389	-2.065	-1.0065	0.8161	-0.233	-0.0237
BOUDH	0.4623	0.735	0.3484	0.0082	-2.638	-0.1035	0.2963	-1.044	-0.1603	0.2506	1.149	0.540	0.7875	0.270	0.034
CUTTACK	0.0001	3.791	2.433	0.3806	-0.877	-0.036	0.0363	2.093	0.3085	0.0018	3.117	1.6815	0.1959	1.293	0.439
DEOGARH	0.2783	-1.102	-0.4974	0.0693	-1.817	-0.1054	0.9518	-0.060	-0.012	0.1671	-1.382	-0.5838	0.5672	0.572	0.0744
DHANSKANAL	0.0940	1.075	0.9631	0.1788	-1.344	-0.061	0.4077	0.828	0.1573	0.2212	1.223	0.5802	0.5392	0.614	0.1695
GAJAPATI	0.0001	3.884	2.4006	0.2592	-1.128	-0.0254	< 0.0001	3.991	0.677	0.0014	3.187	1.5311	0.1729	1.363	0.4965
GANDAM	0.0017	2.828	1.4963	0.2753	-1.093	-0.0421	0.0140	2.456	0.3254	0.0384	2.070	0.75	0.2081	3.290	0.431
JAGATSINGHAPUR	0.0001	3.819	2.3462	0.0305	-1.936	-0.09	0.0038	2.893	0.3918	0.0056	2.912	1.4577	0.2383	1.130	0.5817
JAJPUR	0.0042	2.735	1.6786	0.4169	-0.812	-0.0377	0.0313	2.154	0.4066	0.1035	1.628	0.906	0.1729	1.363	0.3711
JHARSUGUDA	0.0878	-1.707	-0.9274	0.1018	-1.470	-0.0628	0.7167	0.365	0.0543	0.0502	-1.958	-1.0369	0.0271	2.210	0.1997
KALAHANDI	0.6789	0.414	0.2602	0.0347	-2.112	-0.0489	0.1849	-1.326	-0.2014	0.3972	0.847	0.5325	0.7837	-0.274	-0.0293
KANDHAMAL	0.0065	2.721	1.879	0.7029	-0.581	-0.0112	0.0430	2.024	0.3207	0.0324	2.140	1.0754	0.1288	1.319	0.338
KENDRAPARA	0.0186	2.549	1.5647	0.0098	-2.584	-0.1323	0.3403	0.954	0.1593	0.0004	1.693	0.9069	0.8675	1.828	0.5428
KEONJHAR	0.3688	0.902	0.4676	0.1811	-1.537	-0.0938	0.1428	1.463	0.2558	0.9407	-0.074	-0.0285	0.1441	1.461	0.2537
KHORDHA	0.0010	2.973	1.7565	0.1880	-1.216	-0.0498	0.0309	2.158	0.312	0.0043	2.856	1.2657	0.7518	0.516	0.1249
KORAPUT	0.0013	2.638	2.0040	0.0148	-2.437	-0.0579	0.4623	0.735	0.1139	0.0071	2.954	1.8272	0.7083	1.019	0.2334
MALKANGIRI	< 0.0001	4.298	2.8572	0.0401	-2.053	-0.0376	0.2841	-1.270	-0.1534	0.0001	1.775	2.4045	0.2186	1.154	0.3007
MAYURBHANJ	0.0416	2.038	1.1822	0.1288	-1.519	-0.1251	0.1106	1.596	0.3147	0.2355	1.186	0.354	0.1127	1.586	0.2933
NABARANGAPUR	0.2642	1.116	0.8463	0.1186	-1.561	-0.0262	0.1758	1.354	0.1789	0.0968	1.661	1.0069	0.9592	0.063	0.0101
NAYAGARH	0.0012	3.242	1.935	0.7837	-0.274	-0.0684	0.0309	2.345	0.3873	0.0115	2.526	1.1698	0.4882	0.693	0.2188
NUAPADA	0.0003	-1.605	-2.0753	0.0535	-1.913	-0.0502	0.3916	-0.851	-0.0961	0.0017	-1.145	-1.7043	0.9852	-0.019	-0.0026
PURI	< 0.0001	4.201	2.3423	0.0386	-2.068	-0.0717	0.0689	1.819	0.2385	0.0002	3.763	1.6282	0.1805	1.340	0.4196
RAYGADA	0.4263	0.708	0.4991	0.3103	-1.015	-0.0237	0.0295	2.177	0.4167	0.9926	-0.000	-0.0055	0.2910	1.084	0.2373
SAMBALPUR	0.9074	-0.116	-0.0545	0.2100	-1.254	-0.0645	0.0187	-0.498	-0.059	0.9852	0.019	0.0191	0.2074	1.261	0.1223
SONPUR	0.5547	-0.991	-0.1465	0.0199	-1.041	-0.0812	0.3768	-0.888	-0.1092	0.5119	-0.656	-0.316	0.6670	0.167	0.0231
SUNDBARGARH	0.0112	-2.535	-1.3201	0.1121	-1.589	-0.0925	0.6960	0.391	0.0421	0.0058	-2.759	-1.4334	0.2008	1.279	0.1379





If we considered Annually rainfall trend, we found that Balasore, Baragarh, Bolangir, Cuttack, Gajapati, Ganjam, Jagatsinghpur, Jajpur, Kandhamal, Kendrapara, Khordha, Koraput, Malkangiri, Mayurbhanj, Nayagarh, Nuapada, Puri,

Sundergarh districts indicates the presence of a trend in the series. The Bargarh, Boudh, Jagatsinghpur, Kalahandi, Kendrapara, Koraput, Malkangiri, Nuapada, Puri, Sonpur districts show the presence of a trend in the series in Winter.



During the Pre-monsoon season, Cuttack, Gajapati, Ganjam, Jagatsinghpur, Jajpur, Kandhamal, Khordha, Nayagarh, Rayagada districts show the presence of trends in the observations. During the Monsoon season Baragarh, Bolangir, Cuttack, Gajapati, Ganjam, Jagatsinghpur, Jharsuguda, Kandhamal, KhordhaKoraput, Malkangiri, Nayagarh, Nuapada, Puri, Sundergarh districts show a trend in the series of observations. During the Post-monsoon season, we found that no districts showed any kind of presence of trend in the observations.

During the Annual Rainfall period, Bargarh, Bolangir, Deogarh, Jharsuguda, Nuapada, Sambalpur, Sonpur, Sunderghar districts show negative trends, except these all remaining districts show positive trends. Bargarh, Balangir, Nuapada, Sundergarh districts show significant negative trends. During, Winter Season all districts show negative trends. Bargarh, Boudh, Jagatsinghpur, Kalahandi, Kendrapara, Koraput, Malkangiri, Nuapada, Puri, Sonpur districts show significant negative trends in the series. During the Pre-monsoon season, Bargarh, Bolangir, Boudh, Deogarh,

Kalahandi, Malkangiri, Nuapada, Sambalpur, Sonpur districts show non-significant negative trends, excepts these all districts show positive trends. During the Monsoon season, Bargarh, Bolangir, Deogarh, Jharsuguda, Keonjhar, Nuapada, Raygada, Sonpur, Sundergarh districts show negative trends, out of these Bargarh, Bolangir, JharsugudaNuapada, Sundergarh districts show significant negative trends. During the Post-monsoon season, Bolangir, Ganjam, Kalahandi, Nuapada districts show non-significant negative trends, except all districts show positive trends.

The estimated Sen's slope has been calculated for 30 districts of Odisha on an annual and four-season basis. Positive Sen's slope value indicates the rising trends of magnitude in the series and the Negative Sen's slope value indicates the decreasing trends of magnitude in the series. During Mann-Kendall's test results, we got some districts that show negative trends, these districts show negative trends in Sen's slope test as well. Mann-Kendall trend analysis has shown a negative trend, similar negative slope has been observed for the Sen's Slope and vice versa.

b. Trend analysis using Regression model

DISTRICT	ANNUAL		WINTER		PREMONSOON		MONSOON		POSTMONSOON	
	Y Value	R2 Value	Y Value	R2 Value	Y Value	R2 Value	Y Value	R2 Value	Y Value	R2 Value
ANGUL	0.3795x + 539.93	0.0042	-0.1285x + 286.45	0.0182	-0.0414x + 185.71	0.0007	0.3649x + 313.6	0.0052	0.1845x - 245.83	0.0104
BALASORE	1.8046x - 2000.9	0.0671	-0.0925x + 222.96	0.0078	0.2064x - 222.37	0.0082	1.0306x - 892.61	0.0323	0.6601x - 1108.9	0.0412
BARAGHAR	-1.0817x + 3416	0.036	-0.1111x + 241.03	0.0344	-0.1761x + 408.99	0.0271	-0.8762x + 2865.5	0.0283	0.0817x - 99.495	0.0062
BHADRAK	0.8569x - 220.61	0.0181	-0.1225x + 277.35	0.0157	0.1897x - 223.47	0.0093	0.266x + 561.35	0.0028	0.5237x - 835.82	0.0276
BOLANGIR	-0.8106x + 2880.9	0.0187	-0.0778x + 173.29	0.0193	-0.1334x + 336.14	0.0131	-0.6144x + 2325.9	0.0124	0.015x + 45.55	0.0001
BOUDH	0.7733x - 271.3	0.0166	-0.1579x + 336.95	0.0425	-0.2001x + 476.47	0.0189	1.0262x - 975.74	0.0348	0.1051x - 108.98	0.0044
CUTTACK	2.7989x - 4155.3	0.1506	-0.0611x + 153.6	0.004	0.3029x - 491.69	0.0372	2.1857x - 3307.2	0.1327	0.3714x - 509.98	0.0125
DEOGARH	-0.5407x + 2408.3	0.0082	-0.1281x + 284.99	0.0206	-0.068x + 219.97	0.0025	-0.4991x + 2121.3	0.009	0.1545x - 217.96	0.0124
DHENKANAL	0.837x - 325.11	0.0187	-0.1174x + 266.25	0.012	0.1024x - 83.414	0.0036	0.6324x - 237.01	0.0162	0.2196x - 270.93	0.0075
GAJAPATI	2.8392x - 4467.1	0.162	-0.0313x + 79.172	0.0038	0.7382x - 1343.6	0.1338	1.6241x - 2431	0.1112	0.5082x - 771.66	0.0202
GANJAM	1.6989x - 2189.8	0.0798	-0.0773x + 178.39	0.0116	0.2478x - 394.08	0.0291	0.9441x - 1054.4	0.049	0.5844x - 919.64	0.0247
JAGATSINGHAPUR	2.4914x - 3532.1	0.1309	-0.0956x + 216.62	0.0127	0.4316x - 756.35	0.0868	1.6877x - 2314.8	0.0898	0.4677x - 677.51	0.0178
JAJPUR	1.8174x - 2128.6	0.073	-0.0775x + 188.19	0.0061	0.3438x - 538.58	0.0339	1.1096x - 1099.1	0.0395	0.4415x - 679.15	0.0213
JHARSUGUDA	-0.6393x + 2657	0.0104	-0.0957x + 214	0.0235	-0.0127x + 83.489	0.0002	-0.8229x + 2871.3	0.02	0.2921x - 511.85	0.0694
KALAHANDI	0.8622x - 296.21	0.0149	-0.1013x + 216.05	0.0371	-0.2849x + 662.46	0.0296	1.2429x - 1267.9	0.0349	0.0054x + 93.206	1.00E-05
KANDHAMAL	2.6562x - 3946.3	0.1106	-0.0419x + 107.75	0.0039	0.2143x - 320.94	0.0174	1.9999x - 2918.1	0.0858	0.4839x - 814.96	0.0449
KENDRAPARA	1.4971x - 1458.8	0.052	-0.1498x + 324.48	0.0293	0.1265x - 125.32	0.0054	0.856x - 579.28	0.025	0.6644x - 1078.7	0.0374
KEONJHAR	0.9177x - 440.29	0.0207	-0.1494x + 336.69	0.0176	0.2082x - 272.56	0.0134	0.514x + 52.637	0.0092	0.3449x - 557.06	0.0333
KHORDHA	2.0053x - 2671.3	0.0887	-0.0923x + 213.37	0.0095	0.2669x - 432.07	0.0353	1.672x - 2395.1	0.1033	0.1586x - 57.589	0.0016
KORAPUT	2.9802x - 4512.5	0.1143	-0.1015x + 213.04	0.0544	-0.0481x + 215.6	0.0006	2.9676x - 4797.1	0.1339	0.1621x - 143.98	0.0042
MALKANGIRI	4.0998x - 6847.2	0.2419	-0.0523x + 113.12	0.0239	-0.1881x + 459.78	0.0174	4.075x - 7074.5	0.2573	0.2653x - 345.65	0.011
MAYURBHANJ	1.5161x - 1562.2	0.0546	-0.1627x + 364.8	0.0222	0.2812x - 385.25	0.0182	0.9609x - 820.19	0.0338	0.4367x - 721.53	0.0355
NABARANGAPUR	1.5482x - 1580.1	0.0325	-0.0548x + 123.75	0.0109	-0.0074x + 131.3	2.00E-05	1.6002x - 1935.4	0.0406	0.0103x + 100.29	2.00E-05
NAYAGARH	2.303x - 3275.5	0.1101	-0.0403x + 112.3	0.0019	0.3093x - 506.43	0.0398	1.7504x - 2532.6	0.1012	0.2836x - 348.75	0.0071
NUAPADA	-1.7789x + 4791.9	0.0789	-0.076x + 165.74	0.0222	-0.1597x + 388.11	0.0178	-1.5195x + 4117.9	0.0663	-0.0238x + 120.09	0.0003
PURI	2.8044x - 4304.5	0.1715	-0.0799x + 181.99	0.0111	0.1814x - 271.24	0.0199	2.1688x - 3388.4	0.1509	0.534x - 826.8	0.0254
RAYGADA	0.5313x + 235.74	0.0071	-0.0474x + 108.6	0.0122	0.1673x - 206.27	0.007	0.1942x + 615.03	0.0013	0.2172x - 281.63	0.01
SAMBALPUR	0.2861x + 805.92	0.002	-0.0918x + 209.54	0.0161	-0.0953x + 256.82	0.0062	0.2412x + 724.13	0.0017	0.232x - 384.57	0.0351
SONPUR	0.4529x + 378.72	0.0048	-0.1183x + 258.18	0.0282	-0.1556x + 377.75	0.0151	0.647x - 175.49	0.011	0.0797x - 81.72	0.0043
SUNDARGARH	-1.1328x + 3624.6	0.0344	-0.1344x + 296.34	0.0329	0.004x + 60.511	1.00E-05	-1.2253x + 3636.3	0.0467	0.2229x - 368.55	0.0337

It is evident from the above figures that Annual Rainfall has increased significantly for the districts of Angul, Balasore, Bhadrak, Boudh, Cuttack, Dhenkanal, Gajapati, Ganjam, Jagatsinghpur, Jajpur, Kalahandi, Kandhamal, Kendrapara, Keonjhar, Khordha, Koraput, Malkangiri, Mayurbhanj, Nabarangpur, Nayagarh, Puri, Rayagada, Sambalpur, Sonpur

except for the districts of Baraghar, Bolangir, Deoghar, Jharsuguda, Nuapada, Sundergarhfor which a very weak decrease in Rainfall is observed. If we considered Winter season rainfall, we observed that all the districts show a very weak decrease in rainfall. During the Pre-monsoon season Angul, Bargarh, Bolangir, Boudh, Deoghar, Jharsuguda,



Kalahandi, Koraput, Malkangiri, Nabarangpur, Nuapada, Sambalpur, Sonpur districts observed a decrease in rainfall, except these districts all other remaining districts of Odisha observed an increasing Rainfall during Pre-monsoon season. In the Monsoon season Baraghar, Bolangir, Deogarh, Jharsuguda, Nuapada, Sundergarh indicate a decrease in Rainfall, remaining districts of this season indicate an increase in Rainfall. During the Post-monsoon season only one district, Nuapada shows a decrease in Rainfall, and other districts observed an increase in Rainfall.

During Annual rainfall, Malkangiri districts show the highest increase in Rainfall (4.0998 mm) and have increased by 487.876 mm during the last 119 years. Nuapada district observed the highest decrease in rainfall by 211.6891 mm during the last 119 years. During Winter, all districts observe a decrease in rainfall. Mayurbhanj district observed the highest decreased in rainfall by 19.3613 mm during the last 119 years. During the Pre-monsoon season, Gajapati districts show the highest increase in rainfall (0.7382 mm) and have increased by 87.8458 mm during the last 119 years. Sonpur district observed the highest decrease in rainfall by 18.5164 mm during the last 119 years. In the Monsoon season, Malkangiri districts observed the highest increase in rainfall (4.075 mm) and have increased by 484.925 mm during the last 119 years. Nuapada district observed the highest decreased in rainfall by 180.8205 mm during the last 119 years. In the Post-monsoon season, Balasore districts observed the highest increase in rainfall (0.6601 mm) and have increased by 78.5519 mm during the last 119 years. Nuapada districts observed the highest decreased in rainfall by 2.8322 mm during the last 119 years.

CONCLUSION

The average annual normal rainfall over Odisha from 1901 to 2019 is 1259.15 mm, with a standard deviation of 231.61 mm. It is found that the monsoon season has a maximum contribution to annual rainfall, and it does not have any strong trend in nature over the study period by using two techniques. However, it was also observed that there is a great seasonal variation in rainfall trends. The percentage deviations of season rainfall were found to be more for dry periods (post-monsoon and pre-monsoon) than for monsoon season. The trend analysis shows that except in winter (which shows negative trends) overall trends show an increment in rainfall.

Balasore district has more rainfall in the annual and pre-monsoon season and second highest in winter (Mayurbhanj has the highest rainfall in this season). Gajapati district has the lowest rainfall in the annual and monsoon season. Jharsuguda district has the lowest rainfall in the Pre-monsoon season and Post-monsoon season. Sundergarh district has high rainfall during the monsoon season and Khordha district has high rainfall during the Post-monsoon season. Because of high rainfall in the Khordha district observes urban flood and water-logging problems occurring in this area during the monsoon season. During, Annual rainfall, Malkangiri, and Koraput district shows least stable (fluctuate more). During Winter Nuapada, during Pre-monsoon season Gajapati, during monsoon season Malkangiri, during Post-monsoon season

Jharsuguda shows least stable in rainfall. During the Pre-monsoon season Balasore district shows very much stable rainfall.

The Mann-Kendall Test represents both positive and negative trends in the area although not much significant. Rainfall varies in different seasons for different years, which are evident in the graphs. Only during the post-monsoon season, all districts observed a non-significant trend During annual rainfall, Malkangiri districts show an increasing trend, and Nuapada districts (-3.6) show a decreasing trend. During Winter all districts show a decreasing trend, Boudh districts observed more decreasing trends as compared to other districts. During the Pre-monsoon season, Gajapati districts (3.9) show an increasing trend, and Kalahandi districts (-1.3) show a more decreasing trend. During the Monsoon season, Malkangiri (4.2) shows an increasing trend, and the Nuapada districts (-3.1) show a decreasing trend. During the Post-monsoon season, Jharsuguda districts (2.2) show a high increasing trend and only three districts show decreasing trends these are Nuapada (-0.01), Kalahandi and Balangir districts. Sen's Slope is also indicating increasing and decreasing magnitude of slope in correspondence with the Mann-Kendall test values.

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A STUDY OF CORPORATE SOCIAL RESPONSIBILITY (CSR) IN EASTERN COALFIELDS LIMITED (E.C.L)

Sneha Banerjee¹, Gourov Kanjilal²

¹Research Scholar, Department of Social Work, Visva-Bharati, Bolpur.

²Post Graduate Diploma in Business Administration, SCDL, Pune.

ABSTRACT

Indian society has traditionally recognised the role of business in societal development. Due to the mandatory nature of Corporate Social Responsibility (CSR) for corporations since 2013 under the Companies Act 2013, it is essential that companies genuinely adopt an approach to implement CSR activities for the benefit of their stakeholders and society. The objective is to assess the significance of CSR and its connection to sustainability, aiming for optimal outcomes from CSR initiatives and long-term advantages for the recipients. This research aims to investigate the perceptions, aspirations, and evaluations of CSR initiatives in the Coal Mining sector by various industry stakeholders.

This paper highlights explicitly the primary CSR initiatives carried out by Eastern Coalfields Ltd. (ECL), a wholly-owned subsidiary of Coal India Limited (CIL). The study analysed annual reports to gain insights into these initiatives. The findings reveal that ECL's CSR investments primarily focus on improving health facilities, education and rural infrastructure.

KEY WORDS - Corporate Social Responsibility, Coalfields, Investments, Stakeholders.

INTRODUCTION

In the realm of coal mining in India, CIL (Coal India Limited) stands out as the foremost public sector undertaking. It oversees operations through seven fully owned subsidiary companies: South Eastern Coalfields Ltd (SECL), Eastern Coalfields Ltd. (ECL), Western Coalfields Ltd (WCL), Bharat Coking Coal Ltd (BCCL), Central Coalfields Ltd (CCL), Northern Coalfields Ltd (NCL), and Mahanadi Coalfields Ltd. (MCL). Additionally, CIL collaborates with the Central Mine Planning and Design Institute (CMPDI), a firm specializing in mine planning and consulting. To address corporate social responsibility (CSR) initiatives at the subsidiary level, a committee has been established in accordance with the provisions outlined in Section 135 of the Companies Act 2013. This committee is tasked with proposing and executing various CSR initiatives, aligning with CIL's CSR Policy objectives, and ensuring a meaningful socio-economic upliftment in the local communities (Singh Jardon & Rahate, 2022).

The commitment to fulfilling social responsibilities has been ingrained in Indian businesses since ancient times. Ancient texts have repeatedly highlighted the tradition of sharing wealth with the needy. Religious customs such as dan, seva, dharmada (among Hindus), zakat (among Muslims), and daashaant (among Sikhs) have prevailed in India for centuries, reflecting the tradition of affluent individuals sharing their wealth with those less fortunate. During British rule, the British Raj overlooked the importance of enacting laws that will look into the requirement for obligatory corporate initiatives aimed at social welfare. The Companies Act of 1956, the post-independent version, lacked provisions compelling corporations to fulfill social responsibilities through mandatory actions. A positive shift occurred with the enactment of the Companies Act in 2013, which allocated a section (Section 135)

specifically addressing corporate social responsibilities. This legislation mandated a minimum expenditure and organized efforts by Indian corporations to fulfil their social obligations (Sarkar, 2023).

The popularity of corporate social responsibility (CSR) may be attributed to the rapid advancement of globalisation and social development. This has led to a greater awareness among firms to uphold their CSR by enhancing their environmental and social performance. In the past, a company's primary goal was to make money, but today's management is focused on both financial and non-financial objectives, risk awareness, and transparency maintenance (Qi Lai, 2006).

OBJECTIVES

The study's primary goals are as follows:

- To study the CSR activities conducted by ECL
- To understand the various budgets and expenditure allocation of CSR activities of ECL
- To look into the effects that ECL's CSR has on society

CSR ACTIVITIES OF ECL

ECL has embraced and put into practice the CIL CSR Policy, which is compliant with the 2013 revision to the Companies Act and the 2014 CSR Rules. Additionally, the DPE Guidelines pursuant to F. No. 15(13)/2013-DPE (GM), issued October 21, 2014, with effect from April 1, 2014, are also followed. CSR efforts have linked the company's operations with social processes by implementing welfare programmes that are mainly targeted at the impoverished, land-displaced, and Project Affected People (PAPs) who reside within a 25-kilometer radius of ECL. According to the CIL CSR Policy, 80% of the funds must be used within 25 kilometres of the ECL Headquarters, Area, or Project, with the remaining 20% going



towards operating expenses inside the State. It made sure that the most vulnerable and impoverished members of society received the most benefits possible to assist their growth and sustainability (Annexure of ECL, 2019).

FUND ALLOCATION

Throughout the fiscal year, the following rules will be adhered to when allocating funds for CSR initiatives:

- a. The CSR fund will be distributed to CIL subsidiaries based on whichever is higher of the following two amounts:
- (i) In accordance with the Companies Act, 2% of the company's average net profit for the three most recent fiscal years;
 - or
 - (ii) Rs. 2.00 per tonne of coal produced in the most recent fiscal year.
- b. The CSR fund for CIL (HQ) will be distributed according to the greater of the two sums shown below:
- (i) according to the Companies Act, 2% of the average net profit of CIL (standalone) for the three most recent financial years;
 - or
 - (ii) For CIL subsidiaries that did not experience a net loss in the previous fiscal year, Rs. 2.00 per tonne of the total coal production of the prior fiscal year.
- c. Any money from the CSR budget that is not used or that is overflowing throughout a fiscal year will be reported in accordance with the current statute's rules. The amount required to be spent in accordance with the legislative rules, or 2% of the average net profit of the company for the three most recent financial years, will serve as the foundation for calculating any unspent or excess amount.

PROJECTS AND PROGRAMS

The projects and Programs have been directed in the following priority areas at ECL:

- a) **Promotion of Education:** The Indian education system might be greatly strengthened by CSR initiatives. Through tackling infrastructure issues, aiding in teacher training, encouraging creativity, and establishing tactical alliances, companies can help shape a more promising future for the nation (Times of India, 2023). The different works ECL is doing in the education sector are infrastructural building, providing equipment, establishment of STEM (Science, Technology, Engineering, Mathematics) labs and science labs at schools, making functional the existing dysfunctional toilets and installation of submersible pump.
- b) **Public Health and Welfare of Divyangjan:** CSR programmes are necessary in the healthcare industry since there is a lack of knowledge on topics like disease prevention, hygienic conditions, prompt vaccination, resource utilisation, and environmental benefits, among other things. There are significant differences in the population in economics terms, education level, hygienic circumstances, lack of awareness of early disease diagnosis and prevention knowledge, etc. It is necessary for CSR initiatives to centre on addressing this precarious circumstance. (Trivedi & Narang, 2017). The areas where ECL is working under the health sector is provision of mobile

vans, Distribution of aids and appliances to Divyangjan.

- c) **Skill Development & Women Empowerment:** A crucial component of corporate social responsibility (CSR) for businesses is empowering women and fostering their spirit of entrepreneurship (Abraham, 2013). ECL provides Operation, Maintenance, Management & Upgradation of ITIs; Women empowerment through skill development/upgradation by training them in the Beauty Therapy Trade; provision of Sewing Machine Operator Training; Livelihood generation for SHG through school uniform tailoring; Electrical Skill Training; Oyster Mushroom Cultivation; and providing training to youth upon Plastic Engineering & Technology.
- d) **Infrastructure development:** In the infrastructure industry, corporate social responsibility (CSR) is based on acknowledging the different stakeholders that a business engages with and emphasising the significance of social environment management for project success (ICA). ECL has constructed a Bituminous Road.
- e) **Ensuring Environmental and Ecological Balance:** The cornerstone of corporate social responsibility, which is based on protecting the environment, is environmental responsibility. A business can guarantee that it leaves natural resources in a better state than when it started by operating at maximum efficiency and supporting relevant causes (Fernando, 2024). Construction of electric crematorium and installation of Solar Street Lights are few works of ECL under the ecological perspective.
- f) **Rural Development & Irrigation:** One tool a business can use to improve the lives of people is Corporate Social Responsibility. A corporation's pledge to advance sustainable development and enhance societal well-being (Verma, 2022). Repair, Renovation and Restoration of Ponds and Talab for agriculture development, Installation of rig bore well, instalment of UV water treatment plants,
- g) **Swacchh Bharat Abhiyan:** CSR funding is allocated to initiatives that teach local populations the value of good hygiene and sanitation. These initiatives support the development of a clean culture and behaviour modification (Malik, 2023). ECL constructed High Drains and culverts to maintain a clean and hygienic environment.

METHODOLOGY

The study design is descriptive in nature. Primary data is collected from the sample of 50 beneficiaries from two subsidiaries of ECL. Secondary data were gathered from the company's website, annexures, and annual reports as well as from reports, publications, and other trustworthy international institutions and sources, as well as from various government ministries, departments, reports, publications, and circulars. The study primarily uses tables and percentages for the presentation of the data.



DISCUSSION

At Eastern Coalfields Limited, corporate social responsibility is mostly supply-driven, meaning that managerial judgement is more important than societal mandates (Nayak, 2003). The conundrum lies in determining the best way to carry out this duty. Some of the activities that fall under the ambit of CSR which Eastern Coalfields Limited proclaims to undertake are as traditional as those that were done in the past by the personnel and social welfare departments. It is important to remember that a firm is not automatically socially responsible just because it contributes to community development. A business must apply CSR strategies in a way that aligns with its vision, mission, and values, and it must adopt a balanced perspective on the subject (Nayak, 2003). Effective CSR practices depend on the acceptability of an organization's operations and are multidimensional in nature, being a multilevel social concept. The degree of social participation influences the extent of the enhancement of acceptability. The social responsibilities

performed by the company are considered effective only if they are readily accepted by society. Many companies integrate CSR into their business decision-making by giving it a prominent place in their core mission, vision, and values documents.

ECL has been engaged in several CSR endeavors to offer comprehensive development for the community. While 24% of the beneficiaries are primarily dissatisfied with inconsistent or nonexistent maintenance of previously completed work and feel that the harm (blasting and pollution) exceeds the aid offered under the CSR umbrella, 76% of the beneficiaries are satisfied with the help that ECL has given them. The majority of ECL's areas lack a dedicated CSR department with staff members. An Assistant Manager is assigned to oversee the CSR department in these areas, but there are not enough people to work as a cohesive team. So, the company should comprise a standing committee in each area to take care of CSR projects and their implementation, though the head quarter of ECL has a comprehensive committee of CSR.

Table – Sector-wise expenditure of Eastern Coalfields Limited from 2019 to 2023

Clauses of Schedule VII Companies Act 2013	Areas of Activities	Year wise Expense (Rs. in Lakh)					Total Exps (Rs. in Lakh)
		2018-19	2019-20	2020-21	2021-22	2022-23	
Clause - 1	Healthcare and Sanitation	-	274.96	329.73	631.48	295.95	1532.12
Clause - 2	Promoting education	-	420.08	497.65	238.00	226.90	1382.63
Clause - 3	Women Empowerment	-	10.94	8.08	0.92	4.76	24.70
Clause - 4	Environmental sustainability	-	141.66	213.33	-	26.25	381.23
Clause - 5	Protection of heritage	-	-	-	-	61.64	61.64
Clause - 6	Benefit to armed forces veterans	-	-	-	-	-	-
Clause - 7	Promoting sports	-	-	-	-	-	-
Clause - 8	Contribution to relief funds	-	-	-	-	-	-
Clause - 9	Supporting technology incubators	-	-	-	5.11	-	5.11
Clause - 10	Rural development	-	298.19	86.52	186.10	76.64	647.45
Clause - 11	Slum area development	-	-	-	-	-	-
Clause - 12	Disaster management	-	-	8.45	-	-	8.45
Clause - 13	Other Activities	-	21.02	11.82	-	-	32.84
Total Amount (Rs. in Lakh)		-	1166.85	1155.58	1061.61	692.14	4076.18

Source - ECL Annual Report

The table makes it apparent that ECL's expenditure because of Corporate Social Responsibility was high (1166.85 lakhs Rs.) in the FY 2019-20, where 36% of it was spent on education and 25.55% on rural development. From FY 2020-21, expenditure on health started taking huge areas due to the COVID pandemic, where ECL helped the society by distributing Rations & Food packets to local needy communities. There was a decrease in the CSR expenditure of FY 2022-23 due to companies fall in production and profit. (Annual reports of ECL 2019-2023).

CONCLUSION

Business operations have consequences that have a big effect on society. Not merely through the provision of goods and services, but also by having an impact on the environment, people's quality of life, and the larger eco-cultural context. As a result, society looks at businesses to behave in a way that serves its interests and ensures that all stakeholders receive a portion of the company's profits (Pathak & Pathak, 2014). Thus, corporate social responsibility (CSR) refers to the methods that coal firms currently use to sway the opinions of the local population in favour of the sector. However, the CSR measures taken by the coal corporations are primarily supply-driven and



do not consider the actual needs at the local level. Making CSR demand-based is necessary.

Eastern Coalfields Limited is making a lot of effort to direct CSR programmes towards community and environmental welfare. Eastern Coalfields Limited's CSR programmes have been implemented in a very positive manner in recent years, and the company has made substantial efforts and expenditures in support of CSR (Bandopadhyay, 2021).

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LEGAL REVIEW IN ASSESSING THE IMPLEMENTATION OF INFECTION CONTROL PLANNING AND PREVENTION (PPI) PROGRAM IN RSU ROYAL PRIMA MARELAN IN 2024: EVALUATION OF LEGAL ASPECTS IN HEALTH MANAGEMENT

Li Hongye

Master of Law study program, Faculty of Law, Universitas Prima Indonesia

ABSTRACT

The National Standard for Hospital Accreditation (SNARS) Edition I includes infection prevention and control standards. The goal of this program in hospitals is to identify and reduce the risk of transmission or infection among various parties, including patients, staff, health professionals, contract workers, volunteers, students, and visitors. This standard ensures that hospitals implement effective infection prevention practices for the well-being and safety of all parties involved in the hospital environment. This study investigates the legal aspects of implementing the Infection Control Planning and Prevention Program (PPI) at RSU Royal Prima Marelan in 2024. The method applied is a qualitative analysis method. The research location was conducted at Royal Prima Marelan General Hospital, and the research was in January 2024. Data analysis involves a Triangulation Test, in which facts are discovered during surveys and observations. The in-depth interview results showed that the fulfillment of facilities and budget allocation for PPI at Royal Prima Marelan Hospital received strong support from the hospital leadership. Integrated management includes budgeting and human resources, including providing funds for education and training activities outside the hospital to form a PPI Team. Regular socialization is also carried out in monthly employee meetings and orientation for new employees. Overall, it can be concluded that Royal Prima Marelan Hospital has successfully implemented an Infection Prevention and Control System (PPI) based on the Regulation of the Minister of Health of the Republic of Indonesia Number 27 of 2017, and its implementation is going well.

KEYWORDS: *Marelan, Planning, Prevention, Control*

I. INTRODUCTION

The government oversees regulations related to the technical prerequisites for hospital accreditation as outlined in Article 40 of Law No. 44 of 2009, which stipulates that "To enhance hospital services, regular accreditation must be conducted at least every 3 (three) years." In 2012, the approach to hospital accreditation began to shift, moving towards a new paradigm where the assessment is centered on services that prioritize patients. Patient safety emerged as the primary standard indicator in the revised accreditation assessment, the 2012 version of Hospital Accreditation. This accreditation framework is aligned with JCI (Joint Commission International), encompassing standards for patient-focused services, hospital management, patient safety goals, and MDG program standards. JCI aims to enhance the quality of care and patient safety without escalating costs. The shift in applicable standards necessitates a corresponding change in mindset and culture within hospitals, moving from a provider-centric to a patient-centric orientation. The Hospital Accreditation assessment tool utilizes the 2012 version of the Hospital Accreditation Commission (KARS), incorporating content adapted from the JCI version of the Hospital Accreditation Instrument, along with the requirement for periodic hospital services at least every 3 (three) years (Wardani & Suyanto, 2022; Noor, 2013).

In continuation of evaluating the outcomes of this initiative, an additional measuring instrument is crucial, namely a hospital service quality instrument that assesses and addresses issues related to the results (output) (Anfal, 2020). Patient safety remains the critical standard indicator in the updated accreditation assessment, known as the 2012 version of Hospital Accreditation (Neri et al., 2018). Healthcare-associated infections (HAIs) represent highly vulnerable issues not confined to hospitals only (Ukuhor, 2021) but are global concerns (Rickman et al., 2021; Zhou et al., 2020). The incidence of HAIs worldwide ranges from 4-10%, contributing to 5-10% prevalence in hospitalized patients in the United States, causing up to 100,000 deaths annually. In the UK, it is estimated that 8-9% of patients acquire infections through healthcare services. Conversely, surveillance indicates a lower incidence of HAIs in Indonesia, ranging from 0-1% (Sutherland, 2020).

Fostering a culture of infection prevention can directly and indirectly enhance service quality for patients and their families, turning them into agents of change (Fennelly, 2020; Stull et al., 2018). SNARS Edition I incorporates standards for infection prevention and control (Putra et al., 2022). The objective of infection prevention and control programs in



hospitals is to identify and mitigate the risk of infection transmission among patients, staff, health professionals, contract workers, volunteers, students, and visitors. The pivotal factor for the PPI program's success lies in the hospital director's commitment to establishing a competent PPI Team and PPI Hospital Surveillance. Infection Prevention and Control (PPI) is categorized within the hospital management standards, underscoring that a well-organized PPI system can elevate the quality of hospital services (Putra et al., 2022).

RSU Royal Prima Marelan, as a Type B hospital in North Sumatra, envisions providing quality health services accessible to all societal strata, prioritizing patient safety and customer satisfaction. Given the background outlined above, researchers are motivated to explore how Infection Prevention and Control Management (PPI) at Royal Prima Hospital Marelan aligns with the regulations outlined in the Minister of Health of the Republic of Indonesia Regulation Number 27 of 2017 concerning Guidelines for Infection Prevention and Control in Health Service Facilities, assessed within the framework of SNARS.

II. LITERATURE REVIEW

Organizing an IOP program aims to identify and reduce the risk of infections acquired and transmitted among patients, staff, health professionals, contract personnel, volunteers, students, and visitors. Infection risks and program activities may vary from hospital to hospital, depending on the hospital's clinical and service activities, patient population served, geographic location, number of patients, and staff.

The program will be effective if it has a defined leader, good staff training, methods to identify and be proactive at infection-risk sites, adequate policies and procedures, staff education, and coordination throughout the hospital. Organizing the PPI (Infection Prevention and Control) program aims to identify and reduce the risk of acquired and transmitted infections among patients, staff, health professionals, contract workers, volunteers, students, and visitors (Astari et al., 2022). Infection risk and program activities may vary from hospital to hospital, depending on clinical activities and hospital services, patient population served, geographic location, number of patients, and number of employees.

According to the Minister of Health of the Republic of Indonesia, Number 27 of 2017 concerns Guidelines for

Infection Prevention and Control in Health Service Facilities. Where in the regulation, it is stated that the PPI program will be effective if it has a designated leader, good staff training, methods to identify and be proactive in places at risk of infection, adequate policies and procedures, staff education and coordination throughout the hospital (Indonesia, 2017).

III. RESEARCH METHODS

The method used in this study is a qualitative analysis method. In particular, this study is a comparative descriptive study with a case study design. The location of the study was conducted at RSU Royal Prima Marelan; the time of this study is January 2024. The subjects in this study were respondents who came from people who were considered competent in providing information related to PPI, which included the Director of Royal Prima Marelan Hospital, the PPI Committee consisting of the Chairman (IPCD / Infection Prevention and Control Doctor), the Secretary (IPCN / Infection Prevention and Control Nurse, IPCLN (Infection Prevention and Control Link Nurse), and PPI Committee Members. Another subject is the Head of the Inpatient Room of the Head of Section at RSU Royal Prima Marelan, which is related to supporting service facilities and facilities associated with PPI.

An operational definition of management is a process of stages of activity consisting of planning, organizing, implementing, and supervising by combining science and art to achieve organizational goals. Data collection instruments and techniques are surveys, observations, document reviews, and interviews conducted by researchers. The statement of this study used an observation checklist and a search method adapted from the SNARS accreditation standard. Data analysis was carried out using the triangulation test by finding facts during surveys and observations regarding the implementation of the PPI program at RSU Royal Prima Marelan seen from the system with a management approach and by comparing the assessment elements in SNARS.

IV. RESULTS OF RESEARCH AND DISCUSSION

The results of the Search / Survey on the Implementation of the Infection Prevention and Control Program at Royal Prima Hospital Marelan based on the National Accreditation Standard (SNARS) Edition I are described in Table 1. Based on the search results, the score for PPI at RSU Royal Prima Marelan is 72.6 %.

Table 1. Survey on the Implementation of Infection Prevention and Control Programs at Royal Prima Hospital Marelan based on the National Accreditation Standard (SNARS) Edition I

No	Information	Score	Percentage (%)
A. Leadership and Governance			
1.	Standard PPI 1	16	60
2.	Standard PPI 2	16	55
B. Resources			
3.	Standard PPI 3	12	55
4.	Standard PPI 4	12	25
C. PPI Program Objectives			



No	Information	Score	Percentage (%)
5.	Standard PPI 5	11	25
6.	Standard PPI 6	10	25
7.	Standard PPI 6.1	12	55
8.	Standard PPI 6.2		
D. Medical Equipment and Medical Consumables			
9.	Standard PPI 7	30	75
10.	Standard PPI 7.1	30	75
11.	Standard PPI 7.2	30	75
12.	Standard PPI 7.2.1	15	75
13.	Standard PPI 7.3	15	75
14.	Standard PPI 7.3.1	30	75
E. Infectious Waste			
15.	Standard PPI 7.4	30	62,5
16.	Standard PPI 7.4.1		
17.	Standard PPI 7.5	50	83,33
F. Food Service			
18.	Standard PPI 7.6	30	75
G. Construction Risks			
19.	Standard PPI 7.7	0	0
20.	Standard PPI 7.7.1	30	80
H. Transmission of Infection			
21.	Standard PPI 8	15	65
22.	Standard PPI 8.1	30	75
23.	Standard PPI 8.2	40	75
24.	Standard PPI 8.3	0	0
25.	Standard PPI 9	35	87,5
26.	Standard PPI 9.1	30	75
I. Quality Improvement and Education Programs			
27.	Standard PPI 10	31	78
28.	Standard PPI 11	31	78
Accumulative Score			74,6

The comprehensive assessment of standards still reveals that specific criteria are assigned a score of "0". Insights from interviews about the execution of the Infection Prevention and Control Program at Royal Prima Hospital Marelán aim to delve into the implementation process, explicitly considering managerial challenges or conflicts and the commitment demonstrated by team members. Leadership commitment to executing infection prevention and control programs has been evident at Royal Prima Hospital Marelán since 2015, coinciding with establishment of the PPI Team. To better understand leadership commitment, the researcher solicited information from respondents regarding facilities, infrastructure, human resources, and budgets within the PPI Team. The findings from in-depth interviews underscore strong support from hospital leadership in terms of fulfilling facilities

and budgeting for the PPI program.

Integrated management support includes budgetary allocations and human resources, particularly funding education and training activities beyond the hospital to establish a proficient PPI Team. Although in-house training for all employees related to essential PPI was last conducted in 2015, no documented plans for future in-house training have been identified in the PPI program documents. Communication and cooperation in PPI implementation and regular socialization during employee meetings and new employee orientations are essential communication activities reported by IPCN. To assess member commitment, the researcher elicited information on the PPI work program and the duties and functions of the PPI Team staff at RSU Royal Prima Marelán. The interviews revealed that



not all PPI Team members know the organizational structure and roles. Although not all members fully comprehend the work program, in-depth interviews indicate that PPI Team respondents know their duties and responsibilities.

Infection prevention and control in hospitals align with the implementation of hospital standards to achieve accreditation. According to Law (UU) Number 44 of 2009 regarding Hospitals, periodic accreditation every 3 (three) years is mandated to enhance the quality of hospital services. This accreditation is conducted by an independent institution, nationally and internationally, based on applicable accreditation standards. The PPI standards are outlined in Chapter II of Hospital Management Standards in SNARS Edition I, comprising nine sub-chapters and 28 measures (Ministry of Health Republic of Indonesia, 2018). The researchers' evaluation of the PPI program at Royal Prima Hospital Marelán yielded a score of 60.2%, falling below the 80% threshold set by SNARS Edition I accreditation standards. Consequently, it is acknowledged that the shortcomings in the standards are linked to infection risk management. Recognizing the significance of infection prevention and control in hospitals, there is a need for comprehensive risk management analysis to address infection-related challenges within the hospital environment.

Further evaluations of the implementation can be categorized into sub-chapters within the Infection Prevention and Control Program (PPI) at Royal Prima Hospital Marelán:

Organizational Structure and Leadership Commitment:

Functionally, the Infection Prevention and Control Team at Royal Prima Hospital Marelán operates under the Hospital Director, showcasing the Director's commitment to PPI by establishing the team. The current PPI Team Leader, a contract doctor, has undergone training on PPI, and specialist doctors act as consultants for seamless task execution. The team includes an Infection Prevention and Control Nurse (IPCN) with advanced PPI training, despite concurrently holding roles as Head of Nursing and Head of the Nursing Team.

Membership and Cross-Professional Involvement:

The current organizational structure involves nurses, midwives, and nutritionists, indicating a lack of representation from other crucial units like linen, CSSD, and pharmacy. These are integral to the eleven main components outlined in standard vigilance. The success of the PPI program necessitates cross-professional engagement involving Clinical, Nurse, Laboratory, K3L, Pharmacy, Nutrition, IPSRS, Sanitation, and housekeeping, emphasizing the need for a comprehensive PPI Committee.

Shortcomings in Organizational Regulations:

A deficiency in leadership and governance pertains to the absence of a job description for the PPI Team and the lack of socialization regarding the appointment of its members. Respondents noted existing organizational structures but identified suboptimal coordination or functional relationships with superiors, hindering optimal collaboration. Successful infection prevention and control programs require management support, a well-defined organizational structure, clear roles for

IPCN, authority for the PPI team, available facilities, and individual commitment to infection prevention.

Commitment and Communication:

The commitment can be enhanced by developing a performance improvement monitoring system and a comprehensive understanding of the hospital's values and objectives. Additionally, conducting evaluations of nosocomial infection prevention and control policies based on PPI team advice is crucial.

Education and Training:

Support for infection prevention and control includes budget allocations for education and training activities. The PPI team must attend basic and advanced PPI education, obtain certificates, and continually develop through seminars, workshops, and technical guidance. Adequate budget allocation is evident in providing prevention facilities such as hand rubs, sanitizers, masks, gloves, and personal protective equipment.

Program Restructuring and Continuous Improvement:

The PPI team at RSU Royal Prima Marelán has undergone two restructurings since its formation. Despite challenges, leadership and management support have facilitated the continuation of PPI activities. The implementation of PPI based on regulations has been running for two years, but some aspects remain uncovered due to budget constraints, and monitoring by leadership has not been optimal.

Infection Surveillance

Infection surveillance at Royal Prima Hospital Marelán is conducted by the IPCN, producing quarterly reports. The hospital utilizes indicator data to compare with other hospitals, contributing to continuous improvement in infection prevention and control efforts.

The findings highlight areas of strength and opportunities for improvement within the PPI program at Royal Prima Hospital Marelán, emphasizing the importance of cross-professional collaboration, clear organizational regulations, ongoing education, and robust infection surveillance.

V. CONCLUSION

Based on the findings derived from the research, discussions, and literature review, the following conclusions can be drawn:

- a. Implementation of Infection Prevention and Control System (PPI) at Royal Prima Marelán General Hospital:
 - The general hospitals, specifically Royal Prima Marelán, have effectively implemented an Infection Prevention and Control System (PPI) following the guidelines outlined in the Regulation of the Minister of Health of the Republic of Indonesia Number 27 of 2017.
- b. Effective Implementation at Royal Prima Hospital:
 - The execution of the Infection Prevention and Control System (PPI) at Royal Prima Hospital demonstrates commendable performance. Notably, the commitment exhibited by the leadership of Royal Prima Hospital and the PPI



Organization has been pivotal in successfully integrating and operationalizing PPI programs at Royal Prima Hospital Marelán.

c. Challenges and Obstacles:

- Despite the overall success, there are identifiable challenges in implementing PPI at Royal Prima Hospital. Notably, financial constraints have hindered funding optimization, resulting in limitations in conducting essential training activities related to PPI, mainly external training for other hospitals.

These conclusions affirm the positive strides made in implementing infection prevention and control measures at Royal Prima Hospital Marelán while shedding light on specific challenges that warrant attention, especially in terms of financial support for comprehensive training initiatives related to PPI, extending beyond the boundaries of the hospital.

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