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GROWTH AND FEEDING PATTERN IN CHILDRENS

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ABSTRACT

Breast feeding is more than just feeding and breast milk is more than just a food. Breast milk contains all the nutrients a healthy baby needs. It is a food produced by the mother's body especially for the baby. Breast milk is also rich in anti - infective substances and provides the baby with the best protection against diseases. Breast feeding is important for the healthy growth and development of all babies and creates a unique bond between mother and baby. When the mother breast feeds and holds her baby close she gives warmth, affection and security, as well as food and protection. Breast feeding is important for healthy growth and development of all babies. They need appropriate nutrition, affection, stimulation and protection against infection. Breast feeding meets these needs and gives them the best start in life. It is natural and a basic part of the life process.

KEYWORDS: Breast feeding, Nutrition, Growth, Development etc

1. INTRODUCTION

Breastfeeding is when you feed your baby breast milk, usually directly from your breast. It's also called nursing. Making the decision to breastfeed is a personal matter. It's also one that's likely to draw opinions from friends and family. Many medical experts, including the American Academy of Pediatrics (AAP) and the American College of Obstetricians and Gynecologists, strongly recommend breastfeeding exclusively (no formula, juice, or water) for 6 months. After the introduction of other foods, it recommends continuing to breastfeed through the baby's first year of life. How often a mother should breastfeed her baby depends on whether a baby prefers small, frequent meals or longer feedings. This will change as your baby grows. New borns often want to feed every 2-3 hours. By 2 months, feeding every 3-4 hours is common, and by six months, most babies feed every 4-5 hours. The breast milk which is secreted during the first few days after the delivery is called colostrum. It is most suitable food for the baby during this period because this a high concentration of nutrients the baby needs. It also contains substances that help protect the baby against many infections. Immediately after birth this protection is as important as food. This is why the new born baby should be put to the mother's breast immediately, or at least within the first half hour. Ideally, exclusive breast feeding should be the norm for the first 4-6 months of life. Encourage demand feeding and continue breast feeding as long as possible.

1.1 SIGNS YOUR BABY IS HUNGRY

One of the most common ways your baby will let you know they're hungry is to cry. Other signs your baby is ready to be fed include:

- Licking their lips or sticking out their tongue
- Rooting, which is moving their jaw, mouth, or head to look for your breast
- Putting their hand in their mouth
- Opening their mouth
- Fussiness
- Sucking on things

1.2 INITIATION OF BREAST FEEDING

The first feed deserves special attention. In some societies, this first contact with food is traditionally an important ritual occasion. In Norway, for instance, it used to be customary to prepare a very fat, rich porridge, used solely for festive occasions, and to give the child a little of this to eat soon after birth to protect it against lack of food later in life (Weiser Aall 1973). Some traditions do not allow a child to suck, until a few days after birth. In many societies there is a superstition that colostrum is not good for the infant. The strong yellow colour of this fluid is sometimes associated with pus. Mothers simply wait for the mature milk to come in before they put the baby to the breast. In about the year A.D. 200, the fashionable Greek physician Soranus advised his upper - class lady patients not to put their infants to the breast until 20 days after birth. During this time, according to Soranus, her body was sick, and her milk thick, indigestible, and raw. and not suitable for an infant (Rose, 1882), for the Greek upper - class ladies, this advice created no problem, since wet-nurses were readily available. But in the absence of wet - nurses, it is a very dangerous practice. Not only does the infant often starve for this period, but it makes it more difficult to establish lactation later on. Postponing suckling is an unnatural practice, which we should avoid and discourage. There is no reason why a healthy full-term



baby cannot be put to the breast immediately after birth. There is good evidence that this increases the success and duration of breast - feeding (Salarly, Easton, and Cater, 1978). But although there are many reasons why, a baby should suckle at this time, many supposedly "modern" Hospitals insist on a delay of 24 hours and even sometimes of two or three days before a baby is allowed to nurse. Breast feeding fosters a close physical and emotional contact of the child with the mother. It gives satisfaction to the mother and generates a feeling of importance, indispensability and motherliness. It is apparently free of cost though the lactating mother needs additional 450 calories per day to maintain lactation and her own health. However, the economic benefits of breast feeding to a developing country are obvious considering that in India alone about 22 million nursing mothers produce on an average about 3.7 million tonnes of milk annually.

2. FEEDING SCHEDULE

The feeds should be offered on a semi-demand schedule, keeping in mind that most babies would need to be fed after every 2 to 4 hours. The mother should sit comfortably and keep the baby's head slightly raised and offer alternate breast - at each feed. The baby should be supported from beneath his shoulders and not beneath his head. During the first few days, most of the babies fall asleep after taking a few sucks. The mother should be advised to follow a semi-demand schedule. Thus, if the infant is sleeping at the expected time of feeding, he should not be aroused for feeding. If he is hungry and demands a feed before arbitrarily schedule feeding time, the feed should not be denied. If the baby remains hungry after sucking at the breast during the first two days of life, he may be additionally offered half diluted cow's milk through a feeding bottle. Most babies take 15 to 20 minutes to take an adequate feed. Sucking for too long has bad reputation as a cause of sore nipples, probably because some babies who suck for a long time are sucking in a bad position. They are not satisfied, so they continue. Some babies are satisfied with one breast, others may need to suck at the second breast as well. Alternate breast should be offered first at every other feed. The contented baby is playful, sleeps well, gains weight regularly (after first week of life). The baby must be satisfied for at least two hours before he starts yelling for the next feed.

3. NUMBER OF BREAST FEEDS GIVEN PER DAY

Although we can learn much from other mammals about lactation, we cannot learn from them what is a 'natural' feeding pattern for ourselves, because the frequency with which different animals feed varies so much. It varies between species - from only one or two nursing a day in deer and antelopes to almost incessant feeding in bears. This variation between species depends partly on the solute and protein concentration of the milk (Ben Shaul, 1962). Species with dilute milk tend to feed more often. Women have one of the most dilute milks of all - so if we are to deduce anything from that 'rule', we should expect the human infant to feed very often. But frequency also varies between individuals of the same species, and it even changes in some individual mother - with a different baby and at different times during lactation. The baby may want to feed only two, three, or four times a day. But from the third day onwards, however, this changes. If a baby is given the opportunity to feed on demand, it may want to feed as many as ten to twenty times a day. There is nothing unusual about this, it only shows that the infant is waking up into the world. It needs to be reassured that closeness and cuddling are still available even though it has left the warm moving environment of the womb. For the second week of life most babies begin to demand less, and gradually develop into a routine of their own. Again there is a great individual variation. As the child grows, the feeding pattern should be a compromise between the child's and the mother's needs. Early infant has periods of sudden rapid growth, and at these times, it needs more food. These commonly occur around 3 weeks, 6 weeks, and 3 months of life (Watzky 1979).

4. BOTTLE OR ARTIFICIAL FEEDING

The history of artificial feeding of infants is one of repeated failure. Obviously people have been trying to do it for a long time -- earthenware feeding bottles have for instance been found in the graves of Roman infants (Foot, 1920), and although this may be the earliest attempt for which we have evidence, there is no reason to conclude that it was the first. In 1794, William Moss who was surgeon to the Liverpool lying-in hospital, wrote: "As it has been repeatedly observed that continued and severe griping's and looseness of stool in dry nursing (i.e. artificial feeding) are occasioned by the food, and that it is so difficult a matter to give a proper substitute for the breast, it will appear less surprising that children will sometimes be found who cannot be supported or exist without it (i.e. the breast)." An eighteenth - century paediatric textbook illustrates this in sad detail. In an attempt to feed 130 foundlings in an orphanage outside Rouen in France, only thirteen were still alive after a year and a half, in spite of fresh air, cow's milk, flour porridge, and great care. Even these thirteen were very weak and died soon after (Vahlquist, 1975). The Industrial Revolution of the Western World in the nineteenth century meant a sudden change for much of the population from a subsistence economy to wage earning. It also meant that many mothers with babies had to work away from home - most often in factories in order to earn enough to survive. All these changes created a potential market though not an outright demand - for feeding bottles and commercial infant foods, the first of which were marketed more than a hundred years ago. The 'modern' era of artificial feeding dates back to the beginning of this century. The first attempts to work out an artificial substitute for human milk were made just after the first World War (Gerstenberger and Rub, 1919). Then the availability of an increasing variety of infant foods, both commercial and homemade, caught the attention of paediatricians, who took it upon themselves to establish scientifically acceptable, general rules for infant feeding. On the basis of the calculated nutritional needs of



infants of various ages, they recommended 3 hourly and 4 - hourly intervals between feeds. A suitable average time for giving one feed by bottle was found to be about 20 minutes. These rules carried the austere, strict, no-nonsense tone which prevailed in child rearing in industrialized societies at that time probably a reaction to earlier lax ways.

5. GROWTH AND DEVELOPMENT

The term growth and development are often used interchangeably. In reality they are different though they are inseparable as neither takes place alone. Growth refers to quantitative changes - increase in size and structure. The child not only becomes larger in structure, but the size and structure of the internal organs and the brain also increases. As a result of growth of the brain, the child has a greater capacity for learning, remembering and reasoning. Development refers to qualitative and quantitative changes and acquisition of variety of competences for functioning optimally in a social milieu. Physical growth goes on from birth onwards, in tissues, muscles, bones, height, weight, strength, brain and in fact, in every physical aspect, function or formation. A child grows in every system of his body simultaneously. Each child's growth in weight, height and motor skills, as in other spheres, is unique with his own rate of growth. Infancy and early childhood are periods of very rapid physical growth. Physical growth is somewhat slower during middle childhood. It does not show the dramatic spurts or the rather sudden acquisition of abilities of infancy. Some aspects of growth are orderly and predictable. One can estimate when developmental changes will occur. The baby sits before she stands, stands before she walks, and babbles before she talks. The young child learns to draw a circle before the draws a diamond (Gesell, 1940). The overall process of growth is also continuous. As a child develops, he adds to the skills he has already acquired, and his new skills in turn become the basis for future achievements. While growth is orderly and continuous, the tempo at which it proceeds is uneven and differential. Individual development usually takes place in spurts, with various parts of the body developing at different rates. General body growth is rapid during the preschool years, which slows down during the middle school years and increases rapidly during adolescence, and then tapers off. The brain and head mature dramatically during preschool years, and then development slows to a gradual development into adult hood (Tanner, 1970). At 2 months after conception, the head is nearly one-half the length of the body; by the time of birth, it has decreased in proportion during childhood, even though it continues to grow in size. The sequence of growth is normally an orderly and predictable phenomenon, since all of us experience the stages of development in more or less the same succession. However, children vary a great deal in the pace of their growth. Most of them maintain a fairly consistent growth rate, one that is established at birth and continues throughout development. Thus, the child who develops more slowly than his peers will probably continue this slower rate throughout his life (Haimowitz, 1973). The rate of growth is affected by illness, or by neglect or poor nutrition. If the body is prevented from reaching its target growth at any particular period - and provided the period is not too long - once the adverse condition is corrected, the body is able to speed up its maturation so that at some succeeding time it is again on target. Thus, once a proper diet is introduced, or an illness conquered, or a climate of genuine acceptance and security established, children whose natural growth has been retarded will frequently step up their rates of development. They re-establish their individual tempos, sometimes showing remarkable developments within short periods of time (Haimowitz, 1973). The mechanism by which the human organism knows when to stop "catching up" remains wholly mysterious. Physical growth is affected by various factors, such as inheritance lying in the genetic constitution, nutrition, living conditions and medical facilities and timely help. It is, made out that due to better food, better living conditions and better medical care, boys and girls are found to be taller, heavier and healthier than their counterparts during the last half century in the world as whole (Cole, 1970). An prolonged deprivation has its retarding effect on the rate of growth and on the development. Physical development is affected by many environmental conditions such as supply of food, accident or disease. Even geographical conditions influence physical appearance and health. Nutrition is directly related. to the growth of an infant. Malnutrition during early infancy can adversely affect cell division and cell growth. However, malnutrition seems to be most damaging during periods when brain is growing by increase in cell number. The earlier the onset of malnutrition, the more permanent and far-reaching its effects. Children who are severely malnourished during early infancy may show varying degree of mental retardation, depending on the severity of malnutrition

6. CONCLUSION

The purpose of this rigid approach was originally to make artificial infant - feeding safer, which it doubtless did. At some point however, a dangerous mistake was made, and it is hard to know who is most to blame for this - doctors, nurses, or mothers. The mistake was this: The rules which were designed to make artificial feeding safe, were applied to breast feeding. One of the misunderstandings was over the duration of feeds. A baby usually empties a feeding bottle in about 20 minutes, if the holes in the rubber nipple are the right size. If a baby continues to suck from the empty bottle, however It may swallow some air. The breast, however, is entirely different. Breasts contain varying amounts of milk at different times. The average duration of a feed in traditionally breast-feeding societies, such as rural Kenya, is 13 minutes.

Globally, mothers from a wide variety of socio-environmental contexts often assume slow-growing babies are underfed and erroneously attribute perceived growth retardation to inadequate milk supply or poor milk quality. Breast milk provides the ideal nutrition for infants. It has a nearly perfect mix of vitamins, protein, and fat -- everything your baby needs to grow. And it's all provided in a form more easily digested than infant formula. Breast milk contains antibodies that help your baby fight off viruses and bacteria. Breastfeeding lowers your baby's risk of having asthma or allergies. Plus, babies who are breastfed



exclusively for the first 6 months, without any formula, have fewer ear infections, respiratory illnesses, and bouts of diarrhoea. They also have fewer hospitalizations and trips to the doctor. Breastfeeding has been linked to higher IQ scores in later childhood in some studies. What's more, the physical closeness, skin-to-skin touching, and eye contact all help your baby bond with you and feel secure. Breastfed infants are more likely to gain the right amount of weight as they grow rather than become overweight children. It's been thought to lower the risk of diabetes, obesity, and certain cancers as well, but more research is needed.

BREAST MILK HELPS KEEP YOUR BABY HEALTHY

- It supplies all the necessary nutrients in the proper proportions.
- It protects against allergies, sickness, and obesity.
- It protects against diseases, like diabetes and cancer.
- It protects against infections, like ear infections.
- It is easily digested – no constipation, diarrhea or upset stomach.
- Babies have healthier weights as they grow.
- Breastfed babies score higher on IQ tests.

The health effects of breastfeeding are well recognized and apply to mothers and children in developed nations such as the United States as well as to those in developing countries. Breast milk is uniquely suited to the human infant's nutritional needs and is a live substance with unparalleled immunological and anti-inflammatory properties that protect against a host of illnesses and diseases for both mothers and children (Lawrence, 2010). Breastmilk changes each feed to suit your baby's needs and stage of growth. Babies who are breastfed are also sick less often than babies who are not breastfed.

Babies who are not fed breastmilk have higher risk of:

- **infections in the bladder or kidney**
- **stomach and bowel illness (including diarrhoea)**
- **chest infections**
- **ear infections**
- **allergies (including eczema and asthma)**
- **SIDS (sudden infant death syndrome—cot death)**
- **some childhood cancers**
- **obesity, diabetes and heart disease later in life.**

Because breastfeeding confers many important health and other benefits, including psychosocial, economic, and environmental benefits, it is not surprising that breastfeeding has been recommended by several prominent organizations of health professionals, among them the American Academy of Pediatrics (AAP), American Academy of Family Physicians, American College of Obstetricians and Gynecologists, American College of Nurse-Midwives, American Dietetic Association, and American Public Health Association, all of which recommend that most infants in the United States be breastfed for at least 12 months. These organizations also recommend that for about the first six months, infants be exclusively breastfed, meaning they should not be given any foods or liquids other than breast milk, not even water.

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FITNESS FIRST: REGRESSION ANALYSIS BASICS

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ABSTRACT

Health is a rising area and can lead to a good business proposition. There is always a fight between body weight and lifestyle. Regression analysis can be used to determine the right combination of weight with the age and height of the healthy person. The same is done in the case.

KEYWORDS: BMI, Weight, Height, Regression Analysis, Factor Analysis.

INTRODUCTION

There is always a discussion that tall people can afford more body weights. BMI (Body Mass Index), an indicator of health, also seem to support the same. However, BMI as an indicator is too rigid and talks about a panacea. The pragmatic view on the association of body weight and height is far more different than the tenuous chase of BMI. BMI does not help health enthusiasts much because of its rigidity. In addition to BMI, the fitness experts talk about other parameters of being healthy and fit. Among other things, the parameters frequently discussed in addition to BMI are: body fat and muscle weight ratio, cardiovascular endurance, flexibility etc. The clamour on the limitation of BMI for weight-related problems demands new solutions to the issues related to weight.

A few fitness experts expressed their desire to understand the association between height and weight irrespective of anything else so that they may give the proper advice to the people who come to them for their advice. Just because they wanted to provide this information to their clients, it was decided to gather the data of weight and height only **from those people who are rated by them as healthy** (which was based upon several factors including weight, age, fat, lean muscle weight and a few subjective assessments including mental health parameters). A sample of the data was taken from only healthy people defined by the experts. Data were collected from 10 healthy people. Their weights (in Kg), heights (in cm) and age (in years) are collated as follows.

Sn	Wt	Ht	Age
1	60	165	50
2	75	170	35
3	55	155	65
4	85	175	50
5	74	168	35
6	60	155	40
7	68	150	35
8	79	179	42
9	80	177	30
10	75	167	50

REVIEW OF LITERATURE

Regression analysis is a measure of association. Another popular measure of association is a correlation. The difference between the two is that correlation measures the degree of association. However, the regression finds the exact mathematical association among the variables (Kuknor and Rastogi, 2021, Gautam et al., 2022c, Gautam et al., 2022d, Gautam and Bhimavarapu, 2022). Regression analysis is not limited to cross-sectional data. However, it is used in time series data (Rastogi, 2010b, Rastogi, 2010a, Rastogi, 2011, Rastogi, 2014a, Rastogi and Agarwal, 2020, Rastogi and Athaley, 2019, Rastogi et al., 2021a, Rastogi et al., 2018, Rastogi and Kanoujiya, 2022, Rastogi and Srivastava, 2011, Rastogi et al., 2021d, Sarkar and Rastogi, 2011, Sharma and Rastogi, 2020). Regression analysis can also be used in the panel data analysis (Bhimavarapu and Rastogi, 2021, Gaidhani et al., 2022, Gautam et al., 2022a, Kanoujiya et al., 2021, Pinto and Rastogi, 2019, Pinto and Rastogi, 2022, Rawal



et al., 2022, Sharma et al., 2020, Sidhu et al., 2022, Gautam and Kanoujiya, 2022a., Gautam and Kanoujiya, 2022b., Gautam and Kanoujiya, 2022c). In addition, regression is seen in the primary survey data. Factor analysis (Rastogi et al., 2017), discriminant analysis (Rastogi, 2014b) and structured equation modelling as well (Chetan et al., 2019, Goel and Rastogi, 2021a, Goel and Rastogi, 2021b, Gautam et al., 2022b, Panse and Rastogi, 2022, Rastogi et al., 2020a, Rastogi and Ragabiruntha, 2018, Rastogi et al., 2020b, Rastogi et al., 2021b, Rastogi et al., 2021c, Rastogi et al., 2017., Gautam et al., 2021a., Gautam et al., 2021b).

ISSUES TO BE SOLVED

1. Develop a model to relate weight to the age and height of healthy persons.
2. If a student of height 185 cm and age 25 years comes, using the regression model, estimate the expected weight of that student, assuming he would like to be healthy.

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ANTIDIABETIC ACTIVITY OF POLYHERBAL FORMULATION IN DEXAMETHASONE INDUCED DIABETES IN WISTAR ALBINO RATS

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ABSTRACT

Background: Diabetes mellitus (DM) is a group of disorders that results in too much sugar in the blood due to impairment of lipids, carbohydrates, proteins metabolism.

Aim and objectives: Development and Evaluation of Polyherbal formulation (PHF) and determination of antidiabetic potential of developed formulation in Dexamethasone induced animal model.

Method: In the present study plant parts *Azadirachta indica* (AI) leaves, *Moringa Oleifera* (MO) fruits and *Andrographis paniculata* (AP) root and stem were collected and evaluated as per physico-chemical parameters and active chemical constituents were extracted using hydroalcoholic solvent. The active compounds present in all the three extracts were identified by preliminary phytochemical screening. PHF was prepared in a ratio of 1:1:1 quality of the finished product was evaluated on the parameter's angle of repose, loose bulk density, tapped bulk density, carr's index and hausner ratio as per the World Health Organization's (WHO) guidelines for the quality control of herbal materials. The acute toxicity study of PHF were performed as per OECD guideline 423, rats were orally administered 250, 500, 1000 and 2000mg/kg over 14 days. The oral glucose tolerance test (OGTT) was performed at 200 and 400mg/kg body weight. Antidiabetic activity of the PHF (200 and 400mg/kg) was screened against Dexamethasone (DXM) induced diabetes in rats and glibenclamide was used (5.0mg/kg body weight) as standard drug. The investigational drug was administered for 14 days and the effect of the PHF on blood glucose levels was studied at 14th day after interventional period. At the end of the study, the blood samples were collected from all the animals for biochemical estimation.

Result: The plant parts AI leaves, MO fruits, AP stems and leaves were evaluated as per physicochemical parameters and they were found as per API. Preliminary phytochemical screening of hydroalcoholic extracts were revealed that presence of alkaloids, glycosides, saponins, flavonoids, carbohydrates, steroids, tannins and phenolic compounds in each extract. PHF were developed by mixing of each extract in the same ratio and evaluated. It was found to be angle of repose (θ) 29.1, loose bulk density 0.48gm/ml, tapped density 0.54gm/ml, carr's index 12.50%, hausner's ratio 1.13. Diabetes was induced by DXM and treated with PHF did not show any change in behavior and no mortality was observed during interventional period upto the dose level 2000mg/kg. OGTT was performed by oral administration of PHF with dose 200 and 400mg/ kg body weight result was found to be gradually decreased in blood glucose level 75.75 ± 1.92 mg/dl and 72 ± 2.73 mg/dl at 180min from the study it was predicted that PHF possess Anti-hyperglycemic activity. Experimental study was shows that on repeated administration of PHF and glibenclamide for 14 days, a sustained and significant decrease in the average blood glucose level of diabetic rats was observed. End of the interventional period biochemical parameters were studied, and it was found to be level of SGOT and urea level remain constant at dose of 200mg/kg, decrease in SGPT is near to standard and decrease in creatinine level is greater than Std at dose of 400mg/kg.

Conclusion: PHF containing extracts of (*Azadirachta indica*, *Moringa oleifera* and *Andrographis paniculata*) showed significant antidiabetic and antihyperlipidemic activity which was close to standard drug. Along with remarkable reduction in Total Cholesterol (TC) level and increased in High Density Lipoprotein (HDL) DXM induced diabetes rats. The formulation has emerged as potential combination which can challenge the synthetic drug.

Keywords: Diabetes mellitus; *Azadirachta indica*; *Moringa oleifera*; *Andrographis paniculata*; Polyherbal formulation, Glibenclamide

INTRODUCTION

Importance of Herbal in Mankind

Herbal drugs play an important role in the development of potent therapeutic agents. Furthermore, it has proven their potential for the prevention of several ailments. Earlier human beings started their studies on diseases and its treatments, but there was no evidence found that people have prehistoric use of synthetic medicines for their sickness [1]. However, they



struggled to make use of the things, which could easily procure. The most common thing was found in their surrounding was plants and animals. Several plants were found suitable as a food supplement; some were poisonous and have medicinal importance [2]. Keeping this information in consideration, herbs were transferred from their origin to generation as folk medicine. So, the herbal medicine was known from ancient times. This is only because of the belief that many herbal medicines are known to be free from side effects. Furthermore, it is a fact that the discovery of the new synthetic drug is time consuming & expensive. In the present scenario, the demand for herbal products is growing exponentially. All over the world pharmaceutical companies are currently conducting extensive research on plant materials for their probable medicinal value [3]. Research needs in the field of herbal medicines are enormous; the identification of active compounds from the plants source is still remaining a challenge. So, there should be research-based confirmation on either whole herbs or extracted compounds are superior. The issue of herb-herb and herb-drug interactions is also an important issue, which requires increased awareness and study, as polypharmacy and polyherbacy are common. The new technologies, such as nanotechnology and novel emulsification methods are used in the formulation of herbal products, which mainly affect bioavailability and the efficacy of herbal components and this also needs study. This can lead to reinvestigation of some agents that failed earlier trials and can be restudied and redesigned using new technologies to determine whether they can be modified for better efficacy and fewer side effects [4]. Today, there is an urgent need to develop safer drugs for the treatment of various disorders. As a result, there is a growing interest in the pharmacological evaluation of various plants used in traditional systems of medicine [5].

Diabetes Mellitus

Diabetes Mellitus (DM) is a metabolic disorder associated by impairment in the metabolism of carbohydrate, fat and proteins which was recognized by insufficient insulin secretion or mounting resistance to its action [6]. DM develops due to obesity which is also an increasing problem worldwide, Induces atherosclerosis and other metabolic syndromes [6- 9]. According to the requirements of insulin DM was classified into two main categories; insulin dependent diabetes mellitus (Type 1), and non-insulin dependent diabetes mellitus (Type 2) [10]. Which were proposed by WHO in 1980 and 1985 changed new classification system were identified four types of diabetes mellitus, Type 1 insulin dependent diabetes mellitus, Type 2 non-insulin dependent diabetes mellitus and Type 3 is Maturity Onset Diabetes of the Young (MODY) as well as Gestational Diabetes Mellitus (GDM) was classified as Type 4 [11].

MATERIALS AND METHODS

Drug and Chemicals Used

Glibenclamide (USV Pharma Ltd. India), Straptozotocin (Lab chemicals, India), one touch glucometer (Johnson & Johnson, India), Ethanol (Qualigens, India) and other chemicals were used of analytical grade.

Collection, identification and authentication of plant materials

In the present study, the fresh leaves of *Azadirachta indica*, fruits of *Moringa oleifera* and fresh leaves and roots of *Andrographis paniculata* were collected in February, 2022, from Tirupathi, AP, India. The plants were identified and authenticated by Dr. S. Prakash Rao, Department of Phytochemistry and Pharmacognosy, Columbia Institute of Pharmacy, Raipur, Chhattisgarh, India.

Quality assessment/Physiochemical evaluation of plant materials

Each plant parts were crushed and converted into fine powders than quality assessment of plant materials was done as per the standard procedure of Ayurvedic Pharmacopeia of India. Different parameters were tested with the methods describe in API.

- a. **Foreign organic matter:** According to Ayurvedic Pharmacopeia of India, Foreign matter is described as any material that consist of part of organ or organ part from which the drug is derived. The plant should be free from any foreign particle like dust, insects, faecal matter etc. The percentage of foreign matter should not be more than the limit prescribed in monograph. There should not be any contamination in drug material used for developing the polyherbal formulation (PHF).
- b. **Procedure:** 100-500gm of plant materials were weighed and spread as a thin layer and was inspected first with naked eyes and then with the use of lens (6x). All the foreign matter was
- c. Separated, weighed and percentage was calculated.
- d. **Determination of total ash value:** 3gm of dried powdered sample was weighed in silica dish and it was incinerated at a temperature not exceeding 450 °C until it gets free from carbon. The incinerated material was cooled, weighed and percentage of ash was calculated with reference to air dried drug.
- e. **Determination of acid insoluble ash value:** Ash obtained was boiled with 25ml of dil. HCL for 5 minutes filtered and insoluble matter was collected in crucible and washed with hot water and ignited till constant weight. The percentage of acid insoluble ash was calculated with respect to air dried drug.
- f. **Determination of alcohol soluble extractive value:** 5gm of powdered drug was macerated with 100 ml of alcohol in cork fitted conical flask. Solution was shaken frequently for 6hrs. and was allowed to stand for 18hrs. After 18hr. content was filtered and 25ml of filtrate was evaporated to dryness in a shallow dish at 105 °C to constant weight and percentage of alcohol soluble extractives was calculated with reference to air dried drug.



g. Determination of water-soluble extractives: 5gm of powdered drug was macerated with 100ml of water in cork fitted conical flask. Solution was shaken frequently for 6hrs and allowed to stand for 18hrs. After 18hr. content was filtered, and 25ml of filtrate was evaporated to dryness in a shallow dish at 105 °C to constant weight and percentage of water soluble extractives was calculated with reference to air dried drug. The data generated in respect of above findings will be used as in-house standards.

Preparation of hydro-alcoholic (HA) extracts

The plant parts were washed, shade dried and powdered. In order to prepare the PHF, about 500gm of *Azadirachta Indica* (leaves), 500gm of *Moringa Oleifera* (fruits) and 500gm of *Andrographis paniculata* (roots and leaves) powders were soaked overnight separately in 1000-1200ml of Petroleum Ether (PE). After 3 days the suspension was filtered and PE was to be evaporated overnight. Again, the dried powders were separately resuspended in a Stoppered container with the HA solvent. Allowed to stand at room temperature for a period of 7days. Additionally, extract was concentrated to dryness in a rotary evaporator (Buchi type) under reduced pressure and controlled temperature (37-40 °C) to get percentage yield.

Preliminary phytochemical screening of HA extracts: Crude extract of plants was subjected to different chemical tests to detect the presence of various phytochemical constituents as per procedure adopted in literature by Madhav and Saha. The details are incorporated below in the following Table 1. Results of the entire chemical test are discussed in Results.

Table 1: Preliminary phytochemical screening of HA extracts.

Constituent	Chemical Test	Procedure	<i>Azadirachta Indica</i>	<i>Moringa Oleifera</i>	<i>Andrographis Paniculata</i>
Alkaloids	Mayer's reagent test	Extract+ Dil. HCL + 3ml Mayer's reagent	Yellow precipitate obtained	Yellow precipitate obtained	Yellow precipitate obtained
	Dragendroff's test	Extract + Dil. HCL+ 3ml Dragendroff's reagent	Reddish brown precipitate	Reddish brown precipitate	Reddish brown precipitate
Glycosides	Legal's test	Extract + 10%	NaoH + Sodium	Nitroprusside	Blue colour
Saponins	Flavonoids	Foam test Extract + water	shaken vigorously	Persistance	Foam
	Lead acetate	test	Extract solution of	lead acetate	Yellow
Carbohydrate's	Fehling's test	1ml Fehling A+ 1ml Fehling mixed and boiled for a minute	Brick red precipitate formed	Brick red precipitate formed	Brick red precipitate formed
Steroid's	Salkowski test	Extract(2ml) +2ml+chloroform + 2ml conc. H ₂ SO ₄	Chloroform layer turned red and acid layer green	Chloroform layer turned red and acid layer green	No Chloroform layer Formed
Tannin's and Phenolic Compounds	FeCl ₃ test	Extract+ FeCl ₃	Deep blue Coloured	Deep blue Coloured	Deep blue Coloured

Design and development of PHF

From the extracts of three plants *Azadirachta indica* (leaves), *Moringa Oleifera* (fruits) and *Andrographis paniculata* (roots and leaves), formulation have been made by blending the extracts in ration 1:1:1.

Evaluation of polyherbal formulations

Prepared PHF was evaluated on following parameters:

a. Angle of repose

Angle of repose was determined by using funnel method. The accurately weighed blend was taken in a funnel. The height of the funnel was adjusted in such a way that the tip of the funnel just touches the apex of the heap or head of blend. The drug excipient blend was allowed to flow through the funnel freely on to the surface. The diameter of the powder cone was measured, and angle of repose was calculated using the following equation:

$$\tan \theta = h/r$$

Where, h = height of powder cone formed, r = radius of the powder cone formed

**b. Loose bulk density**

Apparent bulk density was determined by pouring a weighed quantity of blend into graduated cylinder and measuring the volume and weight.

$LBD = \text{Weight of the powder} / \text{volume of the packing}$

c. Tapped bulk density

It was determined by placing a graduated cylinder, containing a known mass of drug excipient blend. The cylinder was allowed to fall under its own weight on to a hard surface from the height of 10cm at two second intervals. The tapping was continued until no further change in volume was noted.

$TBD = \text{Weight of the powder} / \text{vol of the tapped packing}$

d. Compressibility index

The Compressibility index of the blends was determined by Carr's compressibility index.

$\text{Compressibility index (\%)} = (TBD - LBD) \times 100 / TBD$

e. Hausner ratio

It is the measurement of frictional resistance of drug and ideal range should be 1.2-1.5. It is determined by using the following formula:

$\text{Hausner ratio} = TBD / LBD$

Acute toxicity study of PHF as per OECD guidelines

Preparation of formulations: For dosing 100ml of each formulation was prepared by dissolving 5gm of formulation in 100ml of distilled water (so, 1ml contain 50mg of drug).

Experimental animals: Adult Wistar rats (180±10g) of either sex were obtained from Columbia institute of pharmacy, Raipur, Chhattisgarh, India. The animals were housed in large, spacious polyacrylic cages at an ambient room temperature with 12h light/12h dark cycle. Rats had free access to water and rodent pellets diet (Hindustan Lever Ltd, Bangalore, India). The study was approved by the Institute Animal Ethics Committee and all the animal experiments were carried out according to the Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA) guidelines, Regd. No. 1321/PO/ReBi/S/10/10/CPCSEA.

Acute toxicity study of PHF: Acute toxicity studies were carried out in adult female albino rats weighing between 130-180gm by Acute Oral Toxicity method of OECD Guideline No 423. They were administered (orally) with varying doses (250, 500, 1000 and 2000mg/kg body weight) for each of six formulations. Animals were divided into 5 groups of three animals each and were acclimatized for 5 days. Prior to dosing animals were kept fasted overnight and next day each formulation were administered orally at a dose level of 250, 500, 1000 and 2000mg/kg body weight. Rats were observed for clinical signs of toxicity continuously for 2 hours and occasionally for further 4hours for general behavioral and finally for any mortality after 24 hours till 14 days. No mortality was observed during a time period of 14 days.

Oral glucose tolerance test of formulation

Selection of dose: Two dose level were chosen in such a way that one dose was approximately one-tenth of the maximum dose used during the acute toxicity studies, second dose was the twice that of one tenth dose (200mg/kg, 400mg/kg b.wt)

Initial Screening of all the PHF for anti-hyperglycemic activity (oral glucose tolerance test): Formulation was screened for anti-hyperglycemic activity to get the information on their efficacy so that the formulation which is not effective could be modified. Formulation was analysed for anti- hyperglycemic and antihyperlipidemic activity in normal healthy rats by conducting Oral Glucose Tolerance Test (OGTT). Initial testing was carried out at different dose levels of formulation (200 and 400mg/kg b. wt). Overnight fasted rats were weighed and divided in to five groups with 5 rats in each group for each formulation as given below. After 30 minutes, rats of all groups were loaded orally with glucose 2g/kg b. wt. Blood glucose level was determined by glucometer before and at 30min, 60min, 120min, 150min and 180min after loading with glucose.

Group Design for OGTT study:

Group I – Normal Control treated with vehicle i.e. (2ml/kg) distilled water

Group II- Standard given Glibenclamide (5mg/b. wt) Group III- treated orally with F-A 200mg/kg b.wt.

Group IV- treated orally with F-A 400mg/kg b.wt.

**Antidiabetic Activity**

Study protocol: Induction of diabetes and experimental study Diabetes was induced in rats by intra-peritoneal injection of Dexamethasone (45mg/kg b. wt) which was dissolved in normal saline. After 72h of DXM administration blood glucose level was measured by one touch glucometer (Johnson & Johnson, India) to confirm diabetes. Blood samples were drawn by picking the rat tail. The diabetic rats with blood glucose levels ≥ 250 mg/dl were selected for the studies. After 72hr. of DXM injection animal with BGL ≥ 250 mg/dl were divided into different groups (with 5 animals each) for anti-diabetic study of Formulations. Following groups were prepared:

Group I –Normal control (given distilled water)

Group II-Negative control (treated with DXM 45mg/kg b. wt.i.p)

Group III-Standard (Treated with Glibenclamide 5mg/kg b. wt after 3rd day of DXM injection)

Group IV-Treated orally with Formulation A with dose of 200mg/kg b. wt after 3rd day of DXM injection

Group V- Treated orally with Formulation A dose of 400mg/ kg b. wt after 3rd day of DXM injection

Study was conducted for 14 days. Treatment was started from 3rd day. Standard drug and Formulations given daily for 14 days and blood glucose levels were measured with the help of one touch glucometer (Johnson & Johnson, India) on 3rd day (assume as 0hrs.), after 3hrs., 5th day, 10th day and 14th day of experiment. Blood sample was taken by picking the rat tail vein and for the measurement of other biochemical parameters blood sample was withdrawn from retro orbital plexus of rats.

Assessment of Biochemical parameters: At the end of 14th day of experiment, 2-4ml blood sample was withdrawn from retro-orbital plexus of rats and centrifuged at the 5000rpm for 15-20min; serum was separated and taken out with the help of syringe. Serum of rats was used for the analysis of other biochemical parameters through Auto analyser.

RESULTS AND OBSERVATION**Physicochemical evaluation of plant materials**

It was observed that all physicochemical evaluation parameters contain i.e. foreign organic matter, Total ash, Acid insoluble ash, Alcohol extractive and water-soluble extractives of plant drug was found to be within Ayurvedic pharmacopeia limits Table 2.

Table 2: Results of Physico-chemical evaluation of the plant material.

Parameter	<i>Azadirachta indica</i>		<i>Moringa Oleifera</i>		<i>Andrographis paniculata</i>	
	Obtained value	API limit	Obtained value	API limit	Obtained value	API limit
Foreign organic matter	0.002%	NMT 0.3%	1.87 \pm .05%	NMT 2%	1.78 \pm 01%	NMT 2%
Total ash value	3.48 \pm 23%	NMT 5%	4.36 \pm .22%	NMT 5%	1.55 \pm .25%	NMT 12%
Acid insoluble ash value	0.43 \pm .01%	NMT 0.6%	1.33 \pm .25%	NMT 2%	0.30 \pm .03%	NMT 0.5%
Alcohol extractive value	8.30 \pm 0.72%	NLT 6%	11.69 \pm .54%	NMT 12%	9.59 \pm .36%	NLT 7%
Water soluble extractive value	30.78 \pm 0.51%	NLT 28%	22.42 \pm .76%	NMT 23%	7.34 \pm .74%	NLT 5%

(NMT-Not more than, NLT –Not less than).

Percentage yield of all the HA plant extracts

The percentage yields of all HA plant extract are given in Table 3.

Table 3: Percentage yield of HA plant extracts.

Name of Plant Drug	Powdered Plant Drug (gm)	Solvent used Ethanol: Water (10:90)	Percentage yield
<i>Azadirachta indica</i>	250gm	1000ml	11.00%
<i>Moringa Oleifera</i>	250gm	1000ml	24.09%
<i>Andrographis panichulata</i>	250gm	1000ml	15.23%

**Preliminary phytochemical screening of HA plant extracts**

Results of phytochemical screening are shown in Table

4. It was found that *Azadirachta indica*, *Moringa Oleifera* and *Andrographis paniculata* contain all tested phytochemical compounds.

Table 4: Preliminary Phytochemical screening of HA plant extract.

Constituent	<i>Azadirachta indica</i>	<i>Moringa Oleifera</i>	<i>Andrographis paniculata</i>
Alkaloids	+	+	-
Glycosides	+	+	+
Saponins	+	+	+
Flavonoids	+	+	+
Carbohydrate's	+	+	+
Steroid's	+	+	+
Tannin's and Phenolic Compounds	-	+	+

Design and development of PHF

PHF was made in such a way so that it covers most of targeted sites in body to decrease the blood glucose level for their anti-diabetic action. For formulations quantity of doses used in developing the formulation was calculated on the basis of therapeutic doses reported in literatures.

Evaluation of polyherbal formulations: The various combinations of dried powdered extracts of *Azadirachta indica*, *Moringa Oleifera*, *Andrographis paniculata* were prepared and evaluated on the parameters like angle of repose, loose bulk density, tapped bulk density, carr's index and hausner ratio. Preformulation study of the granules showed that all the evaluated parameters were within the acceptable limit Table 5.

Table 5: Evaluation parameters of dried PHF.

Batch	Angle of repose	Loose bulk density	Tapped bulk density	Carr's index	Hausner's ratio
PHF	29.1	0.48	0.54	12.5	1.13

Acute toxicity study of PHF formulation

DXM induced diabetic rats treated with PHF did not show any discernible change in behaviour up to the dose level of 2000mg/kg body weight. No sign of mortality was observed during the observation of 14 days Table 6.

Oral glucose tolerance test (OGTT) of PHF

At 30min after the administration of 2gm/kg glucose orally, the plasma glucose level is significantly increased and the blood glucose level decreases gradually with the administration of formulations. Results are given in Table 6 and results expressed in Mean \pm SD in Table 7.

Findings of OGTT study: It was found that PHF with dose of 200mg/kg body weight showed effective decrease in blood glucose i.e. 75.75 \pm 1.92mg/dl and dose 400mg showed 72 \pm 2.73mg/dl at 180min. From the study it was predicted that PHF possess Anti-hyperglycemic activity.

Antidiabetic Activity

Experimental study: Albino wistar rats of either sex (150-180gm body weight) were used for this study; they were acclimatized and given proper diet. The study was approved by the Institute Animal Ethics Committee and all the animal experiments were carried out according to the Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA) guidelines. Results showed the significantly increase in blood glucose level in DXM treated diabetic rats. Glucose levels measured in blood of normal and experimental rats are given in Table 8. On repeated administration of vehicle, PHF and glibenclamide for 14 days, a sustained and significant decrease in the average blood glucose level of diabetic rats was observed.

**Table 6: Results of Toxicity study of Formulation.**

Group	No of rats	Wt. of rats (gm)	Dose of formulation	Calculated dose (mg)	No. of dead animals
I	3	150.23	250mg/kg b. wt.	37.55	Nil
		148.79		37.19	
		150.12		37.53	
II	3	151.4	500mg/kg b. wt.	75.7	Nil
		145.62		72.81	
		156.01		78	
III	3	150.92	1000mg/kg b. wt.	150.92	Nil
		150.12		150.12	
		152.34		150.34	
IV	3	155.03	2000mg/kg b. wt.	310.06	Nil
		142.34		284.68	
		145.73		291.46	

Table 7: Results of OGTT.

Group	Treatment	No. of rats	Weight of rats (gm)	Dose	Calculated dose	Fasting BGL mg/dl	After loading with glucose 2g/kg b. wt. (Oral Glucose Tolerance Test)				
							30min	60 min	120 min	150 min	180 min
I	Control	5	152.23	2ml/kg b. wt	0.30ml	68	102	116	128	130	127
			149.62		0.29	69	99	110	118	127	123
			155.24		0.31	63	98	113	120	135	129
			161.08		0.32	60	95	120	127	142	135
			153.12		0.3	65	92	115	122	135	130
II	Glibenclamide	5	149.58	5mg/kg b. wt	0.067mg	64	98	86	75	71	62
			151.32		0.067	66	103	90	76	68	58
			166.71		0.075	60	104	89	79	69	58
			168.54		0.075	65	99	80	73	66	60
			160.03		0.072	67	107	91	79	65	61
III	Formulation	5	168.48	200mg/kg b. wt	33.69	67	103	89	90	78	76
			162.72		32.54	69	110	108	95	79	75
			154.13		30.82	71	111	111	99	82	74
			150.34		30.06	69	107	86	93	76	79
			152.16		30.43	70	103	91	89	81	75
IV	Formulation	5	170.02	400mg/kg b. wt	68	60	100	95	85	80	78
			148.53		59.41	61	105	97	79	76	60
			156.61		62.64	63	99	87	79	72	68
			157.09		62.83	66	95	89	84	80	76
			162.08		64.83	60	108	96	86	79	80

Biochemical parameters: Serum TG, Total cholesterol, LDL cholesterol were found to be increased significantly ($P < 0.0001$) in DXM induced diabetic rats (shown in Table 9) as compared to non-diabetic control. HDL cholesterol was found to be significantly decreased in diabetic rats. Treatment with PHF produces a significant reduction in elevated serum TG, TC, LDL-cholesterol level in diabetic rats. In Biochemical Parameters PHF (400mg and 200mg) showed maximum decrease in SGPT, Urea and LDL Cholesterol level i.e. 69.8% near to glibenclamide, 43.36% and 39.6% Table 10.

DISCUSSION

PHF have been developed with combinations of (3 Plants) antidiabetic activity was investigated in albino wistar rats with glibenclamide as standard, DXM was used to induce diabetes in rats. Formulation showed significant decrease in Blood



glucose level with improvement in slight loss of body weight, Albino wistar rats were divided into V groups with n=5 and the diabetic rats received the formulation, vehicle and standard drug. Although formulation showed good antidiabetic activity. It showed 65.8% decrease in average blood glucose level which was very closer to standard drug glibenclamide. i.e. 66.2%. Reason for this superior activity of Formulation may be its potential active constituents which could possess better antidiabetic activity and the second main reason may its synergism (herb-herb interactions) which may be more compatible when formulated together and thus produce more effective results. As mentioned in results all the formulations give dose dependent antidiabetic effect in this combination of medicinal plants. It was proved to be fruitful and comparable to standard against glibenclamide. PHF showed good antidiabetic activity with dose of 400mg (i.e.624%) decrease in blood glucose level. On the basis of best synergistic effect, the lipid content except HDL was found to be increased in DXM diabetic rats. HDL Cholesterol was found to be more increased in combination as compared to individual. All combinations improve the conditions of hypercholesterolemia. PHF showed a greater increase in HDL % level to 57.12 % than those of standard. It has been observed through literatures that plants constituents like glycosides, alkaloids, flavonoids all these constituents have proved to be strong antidiabetic agent through different mechanism.

Table 8: Average OGTT (Blood glucose level expressed in Mean±S.E.).

Group	Treatment	Fasting BGL	30min	60min	120min	150min	180min
I	Control	65.0±3.67	81.63±3.83	96.28±3.70	103.22±4.35	112.45±5.71	128.8±4.38
II	Glibenclamide	64.40±2.70	102.2±3.70	87.2±4.43	76.4±2.60	67.8±2.38	59.8±1.78
III	Formulation	69.2±1.48	106.8±3.76	94.4±4.97	93.2±4.02	79.2±2.38	75.75±1.92
IV	Formulation	62.0±2.54	99.4±3.64	92.8±4.49	82.6±3.36	77.4±3.43	72.0±2.73

Table 9: Effect of PHF on change in biochemical parameters of blood plasma in albino wistar rats from 0th day to 14th day.

Parameters	Group I (Control)		Group II (Negative control)		Group III (Standard)		Group IV 200mg		Group V 400mg	
	0th day	After 15th day	0th day	After 15th day	0th day	After 15th day	0th day	After 15th day	0th day	After 15th day
Cholesterol	47.5	50.7	85.6	95.9	113.4	58.4	96.4	78.2	84.5	49.3
	48.7	49	91.6	112.6	96.7	48.3	120.4	91.3	93.9	58.6
	55	60.2	98.4	126.4	126.5	49.4	98.9	71.7	117.8	80.8
	50.3	48.1	88.2	102.4	109.4	46.7	104.4	79.4	111.9	72.9
	62	55.3	112.4	126.6	89.4	38.7	85.6	59.2	107.8	66.6
Triglycerides	59.8	61.7	166	212.9	155.2	71.2	125.3	79.5	115.7	64.5
	76.2	80.4	97	140.2	93.4	49.6	134.2	99.16	96.9	46.8
	60.4	60.9	113.8	143.8	133.4	73.5	128.7	93.1	129.5	77.8
	68.6	69.9	99.2	124.5	148.9	70.5	106.8	75.7	133.7	84.4
	68.4	67.6	84.3	111.7	138.6	67.3	112.4	78.8	118.9	64.6
SGOT	10.8	11.2	68.2	72.3	49.1	15.2	50.3	30.2	56.7	25.4
	25.2	26.7	59.5	74.6	63.2	20.2	47.6	18.3	45.2	20
	20.5	11.4	52.6	62	58.4	26.3	49.2	21.4	43.8	16.3
	31.6	30.2	49	60.1	41.8	13.1	60.4	39.2	58.4	18.4
	13.7	18.2	70.1	82.4	60.2	21.5	54.2	22.3	53.5	34.3
SGPT	24.6	26.3	62.4	71.2	68.3	17.2	71.9	20.1	75.2	26.2
	29.2	31.4	58	78.8	73.2	25.3	69.8	28.3	60	19.3
	30.1	32.6	59.5	69.2	69.6	21.3	59.2	31.2	63.4	20.1
	18	22.3	70.1	81.9	72.4	19.6	81.3	45.2	71.3	18.3
	15.6	18.7	68	85.6	68.6	20.4	90	48.2	78.6	21.3
Creatinine	0.48	0.52	1.54	1.72	1.59	0.92	1.61	1.33	1.77	1.53
	0.53	0.58	1.63	1.69	1.63	1.11	1.67	1.3	1.64	1.49
	0.61	0.63	1.62	1.82	1.57	0.72	1.73	1.52	1.58	1.24
	0.42	0.69	1.58	1.92	1.88	0.69	1.59	1.1	1.91	1.31



	1.12	1.15	1.42	1.78	1.92	1.23	1.79	1.58	1.62	0.62
Urea	30.2	31.2	86.7	91.2	75.2	23.2	69.3	38.4	78.3	41.2
	29.2	30.4	40.4	94.2	77.6	26.2	72.5	40.1	77.9	38.3
	24.6	25.6	73.8	80.1	68.3	19.4	77.9	44.6	66.1	29.4
	28.2	26.2	78.4	86.6	88.7	31.4	82.3	50.3	81.5	50.2
	22.3	24	93.4	98.3	90.2	35.3	73.4	39.2	69.8	30.4
HDL	40.1	35	21.2	15.2	30	40	17.6	21	18.4	26.4
	35.8	40.3	20.2	12	20.1	41.3	21.3	29.4	23.7	29
	34.4	41.7	18.9	10	18.6	35.3	24.6	30.4	21	29.4
	35.3	38.5	19.2	12.2	15.2	36.2	20	28.6	39.4	45
	41	36.2	30.2	18.1	20.2	38.1	19.2	24.6	28.3	36.4
LDL	22	24.7	58.8	62.3	58.4	25	66.8	42	59.7	31.2
	30.2	32.3	60.2	71.4	56.4	24.8	62.8	45.1	55.8	36
	24.4	20.2	65.4	69.2	68.3	29.4	72.1	56.3	60.3	34.6
	28.6	29	71.2	76.7	67.7	20.4	75.6	60.1	71.7	50
	23.4	30.4	80.4	80.4	60	25.4	68.3	52.4	67.8	38.4

Table 10: Analysis of other Biochemical Parameters.

Treatment	Dose	Biochemical Parameter Maximum Decreased from Day 0th to Day 15 th	% Decreased	Remarks
PHF	200mg/kg b. wt.	SGOT Urea	57.2% 55.25%	Level of SGOT and urea level was found to be remain constant.
	400mg/kg b. wt.	SGPT LDL TC, TG, Creatinine	69.8% 39.60%	Decrease in SGPT is near to standard. Decrease in creatinine level is greater than Std.

CONCLUSION AND DIRECTION FOR FUTURE USE

Since Ancient times medicinal plants as single drug and in combination with other herbal drugs are using in the treatment of various chronic and non-chronic disorders. Ayurveda is one of the most traditional systems of medicine which describes the methodology to use the medicinal plants as healing power in treating the disease. Polyherbalism is also the best concept of Ayurveda, which consists of magical power of healing the disease. Ayurveda is one of the reliable and trustworthy medicine systems. In developing countries mostly 75-95% of populations rely on herbal drugs. Deep research and investigation still needed on this magical system of medicines. Research Studies pertaining to safety, toxicological studies, Standardization, clinical trial studies are still required to grow Ayurveda and increasing its wide acceptability. Numbers of commercialized standardized herbal drugs are quiet less in market since we are lacking in developing the regulatory standards implemented protocols. Diabetes mellitus has appearing as dreadful disorder for society. It directly impacts our metabolic system by making it sluggish in catabolic activities. It is mainly characterized by hyperglycaemia resulted from decrease insulin secretion. This dreadful disease can lead to many more complications like blindness, kidney failure and organ dysfunction. Several synthetic drugs are available in market but with long use of these drugs could lead to serious side effect including the kidney failure there is greater risk of using these synthetic drugs for long term. Study of ancient Ayurvedic books like Charak Samhita and Sushastra Samhita revealed that drugs used in Ayurvedic formulations worked synergistically on root cause of disease. Therefore, a quality control drug will be effective in management of diabetes. In view of above 3 plants, based on their reported mode of action PHF was made. PHF was subjected to acute toxicity study and found to be safe up to dose of 2000mg/kg b.wt. After this oral glucose tolerance test (OGTT) was performed in animal model for preliminary assessment of antidiabetic activity. The antidiabetic activity was studied in albino wistar rats as per standard protocol. The diabetes was induced by use of Dexamethasone (DXM). For the study of antidiabetic activity PHF was given in 2 doses of 200mg/kg b. wt and 400mg/kg b.wt. for 14days. The blood samples of each rat were analysed for various biochemical parameters. The results showed that PHF containing extracts of (*Azadirachta indica*, *Moringa oifera* and *Andrographis paniculata*) showed significant antidiabetic and antihyperlipidemic activity which was close to standard drug. Along with remarkable reduction in Total Cholesterol (TC) level and increased in High Density Lipoprotein (HDL) DXM induced diabetes rats. The formulation has emerged as potential combination which can challenge the synthetic drug.



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BIBLIONYMS IN SENTENCE FORM

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ABSTRACT

The article talks about biblionyms of the Uzbek language, their structural types, special features of biblionyms in the form of sentences.

KEY WORDS: *onomastics, proper nouns, biblionym, name of literal works, biblionym in sentence form*

1. INTRODUCTION

The name given to any artistic, scientific, religious, political works is called a biblionym. Biblionyms serve as a valuable resource for monitoring the development of written speech as a phenomenon with its own characteristics. The biblionyms that are widespread in one or another period with their structure clearly reflect the customs of the language of that period and occupy an important place in the history of the language [1]. In this regard, the study of biblionyms of the Uzbek language and their structural features provides important information. When it comes to proper nouns, it is often said that there is no semantic connection between the object and its name. But this is not the case with biblionyms. A biblionym in the form of a single word, phrase, or sentence refers to the meaning, content, essence, and idea of the work. As H. Hamidov pointed out, the content of any artistic work is hidden in its name [2]. Biblionym can be repeated in the text of the work. This situation is observed more in prose and poetic works.

H. Rahimov says, "The author is the mother of the work, what name she chooses for her child, that is certainly her right... an artistic image is hidden in the title of a work of art" [3]. Based on determining the structure of this "child", we will have the opportunity to know the connections between the biblionym and the text of the work. In Uzbek literature, there are biblionyms in the form of a sentence, although they are less common than other forms, and they have their own characteristics. While in other types of nouns, sentence-form units are very rare, the field of biblionymy is in the first place in terms of the presence of sentence-form onomastic units. Considering that this aspect of biblionymy is not paid much attention in world and Uzbek linguistics, in this article we aimed to research the names of works of art that are similar in terms of structure.

2. MATERIALS AND METHODS

The use of biblionyms in the form of sentences is observed in various historical stages of the Uzbek language. We can witness that biblionyms in the form of sentences are a common phenomenon, especially in the old Uzbek literary language and other period sources. Let's pay attention to the fact that the titles of the chapters of Alisher Navoi's dastan "Khamsa" are in the form of sentences. For example, in the title of chapter XXXI of the dastan "Farhad and Shirin", Shirin's coming to the mountain, to Farhad's presence and the awakening of love for him in her heart is described in the form of a biblionym: "Quyosh tog'din tulu qilg'ondek, ul ko'g'I balo sarvaqtig'a yetgoni va aning metini lam'asining barqi muning xorodek ko'ngliga asir etgoni" [4]. There is a study of the features of these dastan chapter titles and the artwork they contain [5]. Also, the title of the first surprise of the dastan "Hayrat-ul-Abror" is given in the form of a sentence: "Ko'ngulning adam tunidin qutulib, vujud subhiga hamnafas bo'lub, malak olami bahoristonining rango-rang azhori va guno-gun ashjorin tamosho qilg'oni va alarni "Sabbihisma Rabbikal-a'lo" amri bila Qayyumi haqiqiy tasbehiga mashg'ul erkonin bilib, dimog'I bog'ida hayrat gullari ochilg'oni va ul gular atri dimog'idin hush olib, behush yiqilg'oni (When the mind escapes from the night of non-existence and breathes into the dawn of existence, when the colorful view of the springtime of the angelic world appears, watching the various trees and knowing that they are engaged in the real Qayyum rosary with the order of "Sabbihisma Rabbikal-A'la", the flowers of wonder opened in the garden and the flower perfume hit the smoker and fell unconscious)". As the title suggests, the original text uses Arabic words quite extensively. This situation, which started with the naming of the work, led to the formation of the content of the title with the help of Arabic words. Moreover, according to the traditions of the time when Navoi lived, such a title is appropriate [6]. It should be noted that, in addition to the names of the works, the titles of its chapters should also be studied as biblionym. Linguistics has not yet paid attention to this aspect of the matter. According to A. Hayitmetov, giving titles to kitas shows that Navoi's attitude towards kitas



was different compared to other genres: “Navoi gave so much importance to his *kitas* that when he carefully collected them, he placed almost the same amount in each *divan* as a separate type of poem, according to their content. It can be clearly seen in the fact that he put a title on each of them” [7]. While researching the titles of Navoi’s poems, M. Khudoyorova found that it is not difficult to notice that the meaning of the title is made easier for the reader to understand in the poems, the poem entitled “Yamon yamonlig‘ini qilmasa, yaxshilig‘cha bor va bir yaxshilig‘ qilsa, o‘n yaxshi qilig‘cha (If a bad man doesn’t do bad, it’s good; and if he does good, that is equal to ten goods)” in “Favoyid ul-kibar” states that it is a clear proof and cites the continent [8].

We find it necessary to content ourselves with giving examples of *biblionyms* from the period of the old Uzbek literary language related to Navoi’s works. Based on the purpose of the article, we will consider some *biblionyms* in the form of sentences created in the modern Uzbek literary language.

3. DISCUSSION

In Uzbek linguistics, there are still no monographic studies dedicated to the study of the names of specific creative works, but there are some observations and analyses. In one of his articles, N. Ulukov says: “In the works of Gafur Ghulam, among other names, *biblionyms* and *anthroponyms* occupy a special place with their meaning, stylistic essence, form and style” [9].

Among the names of artistic works created in the modern Uzbek literary language, there is a certain number of *onomastic* units in the form of sentences. *Biblionyms* of this form belong to poetic, prose and dramatic works. But this situation was observed more in prose works. *Biblionyms* like “Toshpo‘lat tajang nima deydi” (Abdulla Qadiri), “Adabiyot nadur” (Cholpon), “Dilbar – davr qizi”, “Quyosh qoraymas” (Oybek), “Sen yetim emassan” (Gafur Ghulam), “Barcha shodlik senga bo‘lsin” (Erkin Vahidov) are clear evidence of nouns in sentence form. The title of a work of art (story, short story, novel, etc.) should complement each other in harmony with the text, be able to attract the reader and, of course, be expressive and stylistic. In the works of A. Qahhor and G. Ghulam, we see the same charm and skill; in harmony with the titles of their stories will not escape the attention of the reader [10].

Sh. Bekkulova writes in her master’s thesis: “The educational value of story titles is strong, they are distinguished by their direct impact on the reader’s feelings. In particular, the possibilities of phraseology and sentence-headings in this field are very large” [10]. Some story titles serve to raise the mood of the reader. For example, although A. Qahhor’s stories entitled “Kampirlar sim qoqdi” and “Mayiz yemagan xotin” are based on comedy, negative situations that happen to people are revealed under the background of laughter. The title is repeated in the text and functions as a phrase in the story [11]. The story titled “Kampirlar sim qoqdi” revealed the atmosphere of that time. The title prompts the reader to think and read the story. You can understand what it is about by reading the story [12]. Sh. Bekkulova cited the *biblionym* “Mayiz yemagan xotin” among the titles in the form of sentences. We note that this *biblionym* is in the form of a phrase.

Among the titles used in Gafur Ghulam’s stories, simple and concise, meaningful sentences also occupy a special place. They need no further explanation. Examples: “Chorasi ko‘rildi (Measures have been taken)” – Shundayki, rayon sho‘rosidan tortib, qishloq sho‘rosigacha, rayon soliq idorasidan tortib ayri soliq ro‘yxatchilarigacha choralari ko‘rildi (So, measures have been taken from the district council to the village council, from the district tax office to various tax registrars) [13]. “Hajj was accepted” – In fact, Badalmat Sufi’s “hajj” was “accepted” at the end of his life, not in Mecca, but in Odessa port [13]. “Effendi became immortal” – That’s what happened and effendi became immortal, he is interfering in all our affairs in our life world, making us laugh and making us happy [13]. “Mamagvoy understood” – The title is not repeated in the text, the content is embedded in the text. As we can see, *biblionyms* in the form of sentences, which Sh. Bekkulova paid attention to, were expressed in their place in the text and served to reveal the essence of the work.

Speech titles are used in the stories of Shukur Kholmirzaev [14]. They also consist of extremely concise and simple sentences. Examples: “Nimadir yo‘q bo‘ldi (Something is missing)” – Text: Buni anglab birdan ajralishd va bir-biriga qarashdi: tushundilarki, oralaridan nimadir, nimadir yo‘q bo‘lgan! (Realizing this, they suddenly separated and looked at each other: they realized that something...something was missing between them!)[14]

“Olma yemadim (I didn’t eat the apple)” – Text: Iyagimni qashimoqchiday bo‘lib, olmani sekin og‘zimga eltdim... Qars... Shum bola kuzatib kelayotgan ekan. / A-ha! – deb yuborsa bo‘ladimi. / Bolalar kulib yuborishdi. Tuf, deb tashladim og‘zimdagini. Qo‘limda qolgan qismini ham yerga urdim (As if I wanted to scratch my chin, I slowly put the apple in my mouth... Look... Shum bola is following me./ - A-ha! - the children laughed. I threw it in my mouth. I also hit the ground with the remaining part in my hand) [14].

There are very few *biblionyms* in the form of sentences as titles in the works of Shukur Kholmirzaev, but they are also selected from extremely concise, simple sentences and combined with the text. Shortness of plot, simplicity, broad content is the characteristic feature of the story genre, while the main requirement for the work and its title is brevity and conciseness. Considering the requirements of the title, Shukur Kholmirzaev chose concise language units suitable for the content of the text, with strong emotional expressiveness. Simplicity and vitality characteristic of the writer’s work are reflected in the title [10].



4. CONCLUSION

Speech-biblionyms are diverse in terms of grammatical structure and are characterized by their own characteristics, primarily due to their compactness and conciseness, as well as their use in various forms.

Among the biblionyms, there are also structures that are becoming more common in use, are compact in content, but related to different linguistic concepts in terms of structure. Based on the grammatical nature of word combinations or system of words, simple or compound sentences, it is difficult to judge them as belonging to any of them. We intend to cover them in our future research.

Biblionyms in the form of a sentence can be recognized as distinguishing features of these onomastic level units from other types of nouns.

From the point of view of different classifications of speech, the meeting of biblionyms in the Uzbek language, which is characteristic of all classifications, is an interesting and unique phenomenon, which requires a wider study of the issue in the future.

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ACCEPTABILITY OF MOTION GRAPHIC ANIMATION

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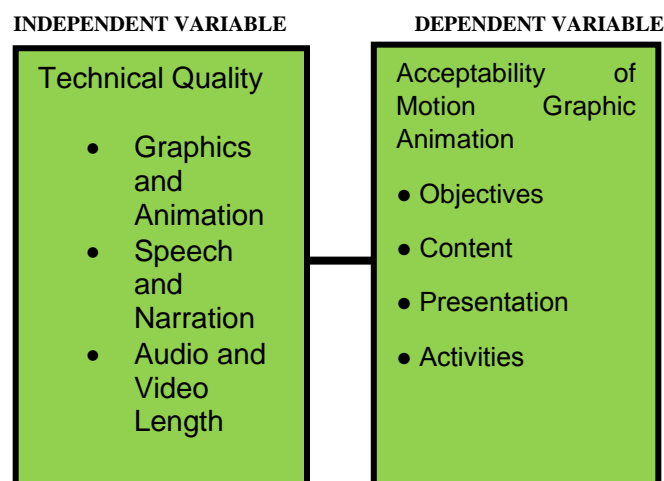
INTRODUCTION

Educators contribute in the academic growth of the learners. They serve as the light house of the education system. Teachers create, develop and utilize appropriate tools and strategies to make learning possible and ensure a quality education. The teachers also facilitate and adapt positively in every changes they may encounter.

As the technology inevitably change and develop, the learners also do. Teachers are continually adapting to this rapid change that learners are experiencing. A question on how they will provide effective and quality education are always a priority. As cited by Amali (2020) lack of students' interest and attention to learn influence their learning process inside the classroom. Teachers who are used to apply traditional teaching found out that students are bored and uninterested especially those who belong to the low performing learners of the class (Ran, 2021). There are also several studies showing that the use of technology as an intervention in mathematics influences students' outcomes, motivation to learn, and attitude about learning (Higgins, 2017). In the teaching learning process, the teacher can use or create various techniques and materials for the different learners. But the use of appropriate, reliable and valid materials is a must.

In order to find the answers on how valid a video lesson is in teaching mathematics, the researcher comes up with the research study to develop and validate a video lesson in mathematics to provide a more motivating, interesting and informative MELC- based video lesson for the learners.

CONCEPTUAL FRAMEWORK



STATEMENT OF THE PROBLEM

The study aims to determine the acceptability of Motion Graphic Animation Learning Videos in Mathematics.

The researcher specifically seeks to answer the following questions:

1. What is the level of acceptability of motion graphic animation in terms of:



- 1.1 Objectives
- 1.2 Content
- 1.3 Presentation
- 1.4 Activities
2. What is the extent of technical qualities in terms of:
 - 2.1 Graphics and Animation
 - 2.2 Speech and Narration
 - 2.3 Audio and Video Length
3. Is there a significant relationship between the component and the technical quality of the Motion Graphic Animation?

HYPOTHESIS

There is no significant relationship between the component and the technical quality of the Motion Graphic Animation.

METHODOLOGY

This study will utilize the descriptive type of research. The descriptive method will be used to analyze the acceptability of the motion graphic animation. The study will use a self-made motion graphic animation learning videos in mathematics and a questionnaire to test its acceptability.

Since this study was about the acceptability of the motion graphic animation learning videos in mathematics, the respondents in this study will be the twenty (20) mathematics and twenty (20) ICT teachers of Cavinti District.

The motion graphic animation learning videos to be used in this study will be made by the researcher using Adobe Pro. The topics to be used are included in the Department of Education Basic Education Curriculum. After securing the permit to conduct the study from the respondents, the motion graphic animation learning videos will be validated by the selected mathematics and ICT teachers of Cavinti District.

To interpret the result, the data that will be gathered will be organized, tabulated and coded for analysis. The means and the standard deviation will be used to get the mean level of acceptability of the motion graphic animation in terms of objectives, content, presentation and activities and also to be used to get the extent of the technical qualities in terms of graphics and animation, speech and narration and audio and video length. The Pearson's Correlation Coefficient will be used to test the hypothesis; in order to determine if there is a significant relationship between the component and the technical quality of the Motion Graphic Animation.

FINDINGS

The findings revealed that There is no significant relationship between the component of the motion graphic animation and the technical qualities." among respondents' rating on the motion graphic animation's acceptability is rejected. To which there is a significant relationship found between the component of the motion graphic animation and the technical qualities in terms of graphic and animation and speech and narration.

CONCLUSIONS

In view of the aforementioned findings, the study has drawn the following conclusions:

1. The level of acceptability of the motion graphic animation in terms of objectives, contents, presentation and activities is extremely acceptable.
2. The findings given by the respondents on the extent of the technical qualities in terms of graphics and animation, speech and narration, and audio and video length is extremely acceptable.
3. There is a significant relationship between the components of the motion graphic animation and the technical qualities.

RECOMMENDATIONS

In the light of the foregoing findings and conclusions of this study, the following recommendations are offered:

1. The Grade three Mathematics teachers may use the developed motion graphic animation videos as tool in the learning process specifically in the district of Cavinti, SDO Laguna.
2. Mathematics teachers may develop videos with good technical qualities as supplementary materials focusing on skills in the K to 12 Basic Education Curriculum that enhances the critical thinking and problem solving skills of the learners.
3. The Mathematics teachers may use the motion graphic animation for revisions, modifications and refurbishments in the future depending upon the needs of the learners and the teachers, too.
4. The teachers should have various trainings and seminars for the enhancement and additional knowledge in producing learning materials like motion graphic animation videos.



A STUDY OF TEACHER FREEZING AMONG SECONDARY SCHOOL TEACHERS IN RELATION TO THEIR SELF CONCEPT

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ABSTRACT

The present study was conducted with the propose to see a comparative and relation study of teacher freezing and self concept among secondary school teachers. The present study was conducted to a randomly selected sample of 100 secondary school teachers. The tool of “teacher freezing rating scale” was developed by Miss Haseen Taj (1996) and “self concept rating scale” was developed by Dr. miss Pratibha duo (1971) was used for the collection of the data in the present study. The data were analysed by employing Mean, SD, t- test. the result of the study showed that the no significant difference and relation between teacher freezing and self concept of boys and girls of secondary schools teachers.

INTRODUCTION

SELF CONCEPT: Self-concept is our perception or image of our abilities and our uniqueness. At first one's self-concept is very general and changeable and as we grow these self-perceptions become much more organized, detailed, and specific.”

Definition:-“A self-concept is a collection of beliefs about one's own nature, unique qualities, and typical behaviour so we say self concept is our mental picture of our self. It is a collection of self-perceptions. For example, a self-concept includes such beliefs as. ‘I am pretty’ or ‘I am hard working. ‘Such belief is called self-concept.”

SELF CONCEPT IS OF THREE TYPES

1. The individual self: It consists of attributes and personality traits that differentiate us from other individuals for example e.g. ‘introvert person.
2. The rational self: It is defined by our relationships with others e.g. sister, brother, uncle etc.
3. The collective self: It reflects our membership in social Group's e.g. British, Indian and Chinese etc.

Components of Self-Concept

Self-concept is composed of two parts: personal identity and social identity.

1. **Personal identity**-It includes personality traits and other characteristics that make each person unique.
2. **Social identity**- It includes the groups we belong to including our community, religion, college, and other groups.

Part of Self-concept

It consists of three parts

- 1 Self image
2. Self esteem
3. Ideal self

Teacher Freezing

Teacher freezing is a term used note to refer to teacher's inability but to mean the overall unused underused and stagnated intellectual psychological social physical and moral potential abilities off teachers. Teacher freezing is defined as a negative



psychological experience which is outcome or the reactions to job related stress. Teacher freezing is an ongoing problem in worldwide. The role of a modern teacher is quite different from what it was in a traditional classroom. A teacher has to play multiple roles and preserve the basic values of life. Every teacher I think wants to success and if we give them pathway to professional development, where we were creating master teachers, they are helping with apprenticeship's, for young new teacher, they are involved in a variety of other activities, that are really adding value to the schools and then we should be able to give them more money for it.

Factors of teacher freezing There are various factors which indirectly define teacher freezing:

- 1) Teacher effectiveness
- 2) Change proneness
- 3) Teacher innovativeness

REVIEW OF RELATED LITERATURE

1) Bharathi and Sree Devi (2016) Conducted a study on the self concept of adolescence. The result of the study shows that the adolescence overall self concept was found as 27.5/ in high and 72.5/ have above average. Hence, the study may help the teachers and parents to maintain the optimum level of self concept of adolescence.

2) Pegolajar Palomino (2017) conducted a study on analysis of self concept in students with compensatory education needs for developing a mindfulness based psycho educational programme. The result of the study shows positive level of self concept in peer relations, Physical appearance and physical ability, and academic self concept in mathematics.

3) Sharma (2020) conducted a study on the impact of teacher commitment on teacher freezing of secondary school teachers. The result of the study is shows that there was no significant difference in level of teacher freezing with respect to stream of secondary school teacher.

4) Jain and Chaudhary (2020) conducted a study of teacher freezing of government and private secondary school teacher. The result of the study. Found a significantly high level of teacher freezing among government school teacher as compared to teacher serving in private schools.

JUSTIFICATION OF THE STUDY

Justification of the study is very important in all research works. The justification of the study also known as the rationality of the study, it's important to convey to the reader why the research work was important. Self concept is how we view our actions skills and distinctive qualities. different studies have been conducted in both yearly education and high year education that like ones self perception to ones achievement in school or academics. recent studies have examined the connection between academic success and several psychological dimensions including self concept mentality and emotional maturity according to a review of the scientific literature. Basically teachers also face the problem of freezing in the way was faced by other members of the society. the present study has been designed to understand more systematically the nature of relationship between teacher freezing and self concept. Teacher freezing is a comprehensive problem which not only includes the teachers inability to teach. Self concept and teacher freezing is garnered worry less research to it. So I want to study in this topic and I want to do to improve to do more.

Objective of the study

- 1) To study and compare of teacher freezing male and female of secondary school teachers.
- 2) To study and compare of self concept male and female of secondary school teachers.
- 3) To find out the relation between self concept of male and female of secondary school teacher.
- 4) To find out the relation between teacher freezing of male and female of secondary school teacher.

Hypotheses of the study

- 1) There will be no significant difference of teacher freezing male and female of secondary school teacher.
- 2) There will be no significant difference of self concept male and female of secondary school teacher.
- 3) There will be no significant relationship between self concept of male and female of secondary school teacher.
- 4) There will be no significant relationship between teacher freezing of male and female of secondary school teacher.

Statement of the problem

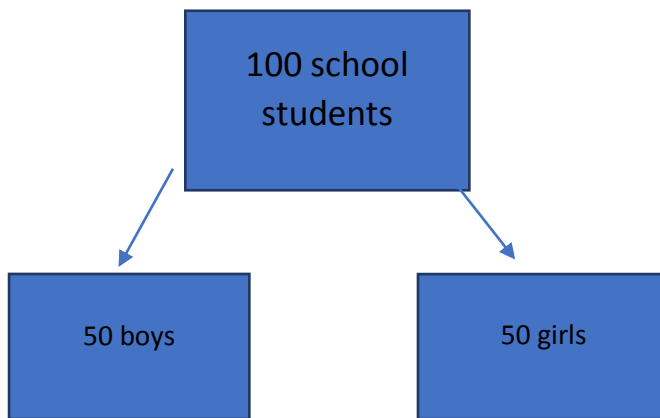
A STUDY OF TEACHER FREEZING AMONG SECONDARY SCHOOL TEACHERS IN REALATION TI THEIR SELF CONCEPT

**Method of the study**

In the present study descriptive survey method of research will be applied.

Sample of the study

In the present study, a sample of 100 students was selected using random sampling procedure with 50 students are boys and 50 students are girls from secondary school.

**Tools to be used**

- 1) Teacher freezing scale by Mrs. Haseen Taj (1996)
- 2) Self concept scale by Dr. Pratibha Deo (1971)

Statistical Techniques

The data analyses using the mean, S.D, T-test and co-relation.

Variables in the study

In the present study, there were two variable i.e. teacher freezing and self concept.

Dependent variable – Self-concept

Independent variable – Teacher Freezing.

Delimitation of the study

1. The study will be delimited to 100 secondary school teacher only.
2. The study will be delimited to only govt and private secondary schools situated in panipat district of Haryana state.
3. The study will be delimited to only one dependent variable i.e. teacher freezing and one dependent variable i.e. self concept.
4. The study will be delimited only secondary school teachers.

RESULT AND DISCUSSION

Objective: 1 to study and compare of teacher freezing male and female of secondary school teachers.

Groups	N	Mean	S.D	T- value	Level of significance
Boys	25	207.72	6.516134	0.256004485	0.01
Girls	25	209.96	7.242697		

The table 1 & figure.1 showed that the mean score of teacher freezing of boys and girls of secondary school students are 207.72 & 209.96 respectively. The t-values come out to be 0.256004485 which is significant at 0.01. Therefore the null hypothesis, “**therefore will be no significant difference teacher freezing of boys and girls of secondary school students is accepted.**”

**Objective 2 :- To study and compare of self concept male and female of secondary school teachers.**

Groups	N	Mean	S D	T- value	Level of significance
Boys	25	192.04	8.60465	0.057161475	0.05
Girls	25	198.04	12.88707		

The table 2 & figure 2 showed that the mean scores of self – concept of boys and girls of secondary school students are 192.04 & 198.04 respectively. The t-values come out to be 0.057161475 which is significant at 0.01. Therefore the null hypothesis, **“therefore will be no significant difference self concept of boys and girls of secondary school students is accepted.”**

Objective:- 3 To find out the relation between self concept of male and female of secondary school teachers.

Groups	N	Mean	SD	T-value	Level of significance
Boys	25	192.04	8.6	0.196112458	0.1
Girls	25	198.08	12.88		

The table 3 & figure 3 shows that the mean scores of self concept of boys and girls of secondary school students are 192.05 & 198.08 respectively. The t-values come out to be 0.196112458 which is significant at 0.01. Therefore the null hypothesis, **“therefore will be no significant relationship between self concept of boys and girls of secondary school students is accepted.”**

Objective: - 4 To find out the relation between teacher freezing of male and female of secondary school teachers.**Table – 4**

Groups	N	Mean	SD	T- value	Level of significance
Boys	25	207.72	6.51	0.239894353	0.01
Girls	25	209.96	7.24		

The table 4 & figure 4 shows that the mean scores of teacher freezing of boys and girls of secondary school students are 207.72 & 209.96 respectively. The t- values comes out to be 0.239894353 which is significant at 0.01. Therefore the null hypothesis, **“therefore will be no significant relationship between teacher freezing of boys and girls of secondary school students is accepted.”**

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A COMPARATIVE STUDY OF LIFE SKILLS AMONG SECONDARY SCHOOL STUDENTS OF PRIVATE AND GOVT. SCHOOLS IN SONIPAT DISTRICT

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ABSTRACT

The aim of the present study was to compare the life skills of secondary school students from government and private schools. A random sample of 100 secondary school students from both private and public schools in the Haryana district of Sonipat participated in the current study. The data for the current study were collected using the Life skills tool created by Nair A.R. & Ranjan S. (2014). The mean, SD, and "t"-test were used to analyze the data. According to the study's findings, there is no significant difference between gender-related life skills in private and public schools.

KEYWORDS: Life skills, Life skills Education, Secondary School Students.

INTRODUCTION

Life skills are adaptable and constructive behavioral traits that enable individuals to successfully deal with the pressures and challenges of daily life. The skills necessary to maximise one's life are referred to as "life skills." A life skill is any skill that is valuable in daily life.

The term 'life skills' is generally used to refer to any of the abilities required to deal well with life's problems. As a result, Everyone will obviously have a different list of skills they believe are most valuable in life and those they believe are useless. If a person lives in a remote rural community, driving a car might be high on their list of essential skills.

According to World Health Organization (WHO), Life skills as the abilities for adaptive and positive behavior that enable individuals to deal effectively with the demands and challenges of daily life.

Three broad categories have been established for life skills:

- Thinking skills: Thinking skills are the ability to use analytical thinking, creative and critical thinking, and critical thinking to strengthen the logical faculty of the brain. Thinking skills refer to the ability to create problem-solving skills to increase decision-making skills.
- Communication skills, effective communication, managerial skills, advocacy skills, teamwork and team-building capability, and other social skills are examples of this category.
- Emotional skills: One example of an emotional talent is knowing and feeling at ease with oneself. Self-management is therefore necessary, which entails learning how to deal with one's emotions, stress, and peer and family pressure.

The skills are more beneficial for learners in dealing with difficult situations and helping them in finding a solution. The skills have a higher educational value since they help students develop their personalities and make them emotionally well-suited to nature.

To help children become smarter, teachers and parents should understand the value of skills and design, organise, and teach programmes and courses that are geared toward developing those skills. As a result, the abilities are beneficial to school students and college students' mental health and competency.

A core set of competencies, however, appears to be at the heart of skills-based initiatives for the enhancement of children's and adolescents' health and well-being, according to research on the subject of life skills. The following are some of them:



Decision making ,Problem- solving, Creative / Critical thinking, Effective communication, Relationship-building skills, Empathy, Self-awareness, Emotional management, Stress management.

REVIEW OF RELATED LITERATURE

The review of literature is a requirement for the actual implementation and planning of research projects. It can assist the researcher in avoiding repetition on the one hand, while also benefiting from similar studies on the other, in terms of methodologies used and products applied to a collection of data, as well as their structure and interpretation.

Mrs. Sonu Rani and Mr. Neeraj (2020) conducted a study titled "A Study on Life Skills of Senior Secondary students." The sample size for this study was 100 students, with a random sampling method being used. The descriptive results revealed that female students in government high schools were found to be less adjusted than male students. In comparison to private high school students, government high school students were found to be less adjusted. The results show that there was no difference in life skills among man and women students.

According to Roodbari, Sahdipoor, and Ghale (2013), Social development, emotional health, and social adjustment are all positively affected by receiving life skills instruction. This improves child compatibility and the general public's health. In their study, **Ramesh and Farshad C. (2004)** demonstrated the value of training in similar skills for improving mental and physical health, pro-social conduct, and reducing behavioral, social difficulties, and self-destructive behaviours.

Puspakumarag (2013) in this study found that the prevention of a variety of adolescent issues, such as substance abuse, teenage pregnancies, violence, and bullying, as well as the enhancement of self-confidence and self-esteem, was made possible by life skills training..

JUSTIFICATION OF THE STUDY

Education plays an important role towards the overall development of human beings. Schooling aids in the development of a healthy personality in children. Elementary (classes I - VIII) and secondary (classes IX -XII) education are the two types of schooling. Today, increasing societal demands, greater complexity, ambiguity, and variety, rapid environmental changes, and persistent deprivation place youths at a crossroads in their life, facing an uncertain future in assuming adult duties and entering the workforce. Life in the twenty-first century is undergoing substantial transformation and development around the world. Adolescents are among the most affected. Adolescents, who are the future of our country, require basic life skills.

If students have stronger life skills, they will adjust more easily and have more self-confidence. With their energy and excitement, the young generation may readily bring about changes in society. That is why the researcher choose secondary school students to see how well they comprehend their life skills, adjustment, and self-confidence. All of the above factors motivated the investigator's choice to develop this study's area.

STATEMENT OF THE PROBLEM

"A COMPARATIVE STUDY OF LIFE SKILLS AMONG SECONDARY SCHOOL STUDENTS OF PRIVATE AND GOVT. SCHOOLS OF SONIPAT DISTRICT."

OBJECTIVES OF THE STUDY

1. To study and compare the mean score of life skills on the basis of gender of secondary school students.
2. To study and compare the mean score of life skill on basis of type of institutions.

HYPOTHESES OF THE STUDY

1. There is no significant difference the mean score of life skill on the basis of gender of secondary school students.
2. There is no significant difference the mean score of life skill on basis of type of institutions.

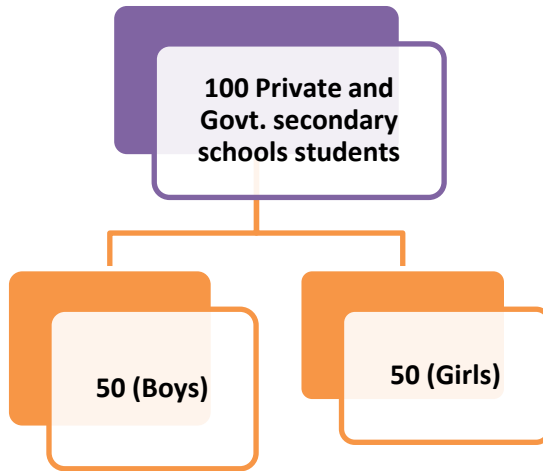
METHODOLOGY OF STUDY

The descriptive survey method will be used.



SAMPLE OF THE STUDY

In this paper, a sample of 100 secondary students was selected using random sampling procedures, with 50 students coming from a government schools and 50 coming from a private schools.



VARIABLE OF THE STUDY

For study purposes, only one variable, namely life skill, was used.

TOOL USED

“Life Skills Assessment Scale” by Nair A.R.& Ranjan S. (2014) will be used.

STATISTICAL TECHNIQUES USED

The data was analysed using the mean, SD, and T-test.

RESULTS AND DISCUSSION

Objective 1: To study and compare the mean score of life skills on the basis of gender of secondary school students.

For the purpose of studying the effect of life skill between boys and girls of secondary school, the null hypothesis was formulated:

“There is no significant difference the mean score of life skill on the basis of gender of secondary school students.”

In order to test the null hypothesis, Mean, SD, t-value & significance level of the scores obtained from life skill scale were calculated in the context of Gender. The results are offered in given table-1.

Table-1

Groups	N	Mean	SD	“t”-value	Level of significance
Boys	50	119.16	8.106	0.0073636	0.05
Girls	50	112.44	9.156		

**Fig. 1**

It can be seen from the **table-1&fig.1** that the t-value of 0.0073636 with 98 degree of freedom was observed significant at 0.05, which shows that the life skills of boys and girls of secondary schools differ significantly. Therefore, the null hypothesis **“There is no significant difference the mean score of life skill on the basis of gender of secondary school students.”** is accepted. Thus, we can say that life skill is not affected by gender. In terms of mean scores it can be concluded that boys & girls are 119.16 & 112.44 respectively.

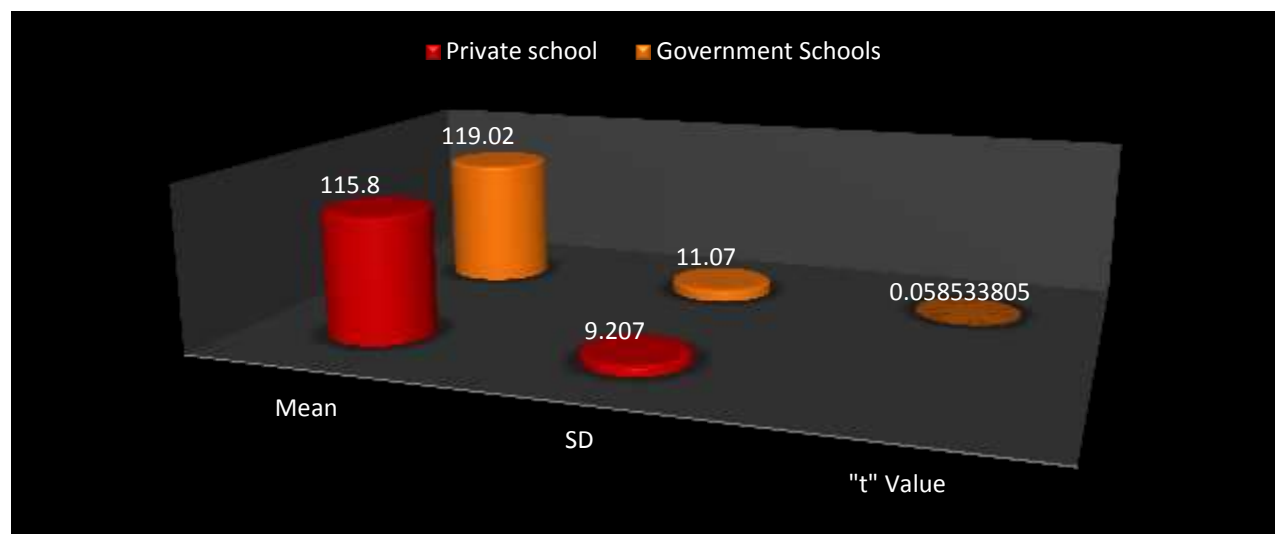
Objective 2: To study and compare the mean score of life skill on basis of type of institutions.

For the purpose of studying the effect of life skill between private and govt. schools students, the null hypothesis was formulated: **“There is no significant difference the mean score of life skill on basis of type of institutions.”**

In order to test the null hypothesis, Mean, SD, t-value & significance level of the scores obtained from life skill scale were calculated in the context of institutions. The results are offered in given table-2.

Table-2

Groups	N	Mean	SD	“t”-value	Level of significance
Private schools	50	115.8	9.207	0.05853381	0.05
Govt. schools	50	119.02	11.07		

**Fig. 2**



It can be seen from the **table-2** & **fig.2** that the t-value of 0.05853381 with 98 degree of freedom was observed significant at 0.05 , which shows that the life skills of private and government secondary schools differ significantly. Therefore, the null hypothesis **“There is no significant difference the mean score of life skill on basis of type of institutions.”** is accepted. Thus, we can say that life skill is not affected by type of institutions. In terms of mean scores it can be concluded that private and government schools are 115.8& 119.02 respectively.

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A STUDY OF SOCIAL SKILLS IN RELATION TO SOCIAL ADJUSTMENT OF SECONDARY SCHOOL STUDENTS

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ABSTRACT

The present study was undertaken to examine the social skill in relation to social adjustment of secondary school students. 100 secondary school students were selected as a sample in this study. Social adjustment inventory questionnaire developed by Dr. Roma Pal (1985) and Matson's Evaluation of social skill with Youngster by Sharma (1997) were used for data collection. Mean, SD, 't'- test and Pearson product Moment correlation were used as statistical techniques to analyzed the data. The results of the study showed that there was positive relationship between social skill and social adjustment of secondary school students.

KEYWORDS: Social Skills, Social Adjustment, Adjustment, Secondary School Students.

INTRODUCTION

Social skills

Social skills can be defined as competence facilitating interaction and communication with other persons. These skills are used to communicate on daily basis, contact with other through body language, verbal and non-verbal gestures. In other words, social skills are the skills which are used to communicate and interact with each other, both verbally and non-verbally through gestures, body language and our personal appearance.

Social skills are important for interaction with each other with predictability, so that a person can more readily understand each other. Social skills are the most important of teacher, students and parents. These skills make help to interaction between teacher and students, teacher and parents. According to Hoban, Shelton, 1998, Social skill as the level or degree of personality, whereby a person demonstrates personal, social knowledge and ability to manage social interaction; social skill are linked to a person's ability to initiate interactions, as well as an adequate response to other's behaviour (Gresham, 2002). It is clear that a significant part of a person's social competence is determined by the quality of social skill. The quality of social skills is important in all areas of human activity.

Basic social skills:

- Making eye contact.
- Reciprocal conversation skills.
- Facial expressions and body language.
- Quality of voice.
- Greeting others.
- Gaining attention and asking for help.

Adjustment

Adjustment is the interaction between a person and his environment. How one adjusts in a particular situation depend upon one's personal characteristics and also the circumstances of the situation. In other's words both personal and environment factors work side by side in adjustment. Adjustment is a dynamics process. Adjustment is highly selective and specialized process.

Different area of adjustment:-

- Social adjustment
- Home adjustment



- Health adjustment
- Emotional adjustment

Social adjustment is a people/children's adjustment behaviour towards society for maintain social life. Human being lives in a society. Everyone wants acceptance and recognition form and within the society. Everyone tries to behave according to the norms of the society that can adjust with others.

According to Campbell, Psychiatrists Dictionary (1996), Social adjustment may take place by adapting the self to the environment or by changing the environment. Social adjustment can be defined as a psychological process. It frequently involves coping with new standards and values. Social adjustment as an important indication psychology health is a topic attracting the attention of many psychologists. Social adjustment requires the development of social activities in different areas. Society takes an important role on the adjustment. Adjustment is very important in their life.

REVIEW OF LITERATURE

Zekavet and Celk (2017) researched on "The Effects of Social Skills 'Training on Elementary School Students' Social Adjustment." Main Objectives of the study was to study the effect of social skills' training programme on the social adjustment of elementary school students. Experimental method with control and experimental group and pre and post- test design was used by the researcher. 38 elementary students from 4th and 5th grades were selected as a sample.

Walkar- McConnell Scale of social competence and School adjustment and personal information scale were used by the researchers for data collection. Findings of the study were that Social skills 'training programme was found effective on students 'social adjustment to school environment. Social skills' training programme was effective on teacher preferred social behaviour. Social skills' training programme was effective on peer- referred social behaviour.

Zehra, et. al. (2019) conducted a researched on "Effectiveness of Social Skills' Training on Social Adjustment of Elderly People. Main Objectives of the study was to study the effectiveness of social skills' training on social adjustment of elderly people. Experimental method with control and experimental group and pre and post- test design was used by the researcher. 60 elderly people served as a sample for the study. Findings of the study were that Social skills' training programme was found to be effective on total social adjustment of elderly people. Social skills' training programme was found to be effective on family adjustment of elderly people. Social skills' training programme was found to be effective on emotional adjustment of elderly people. Social skills' training programme was found to be effective occupational adjustment of elderly people.

JUSTIFICATION

The social skills are not only important for daily communication but they influence the student's adjustment in formal setting. The academic setting i.e. classroom becomes a preparation floor for enhancing the social skills and a field in which these skills are utilized. According to Walker (1983) "Social skills are a set of competencies that allow an individual to initiate and maintain positive social relationships, contribute to peer acceptance and a satisfactory school adjustment, and allow an individual to cope effectively with the larger social environment". Knowing the importance of social skills, the teachers, counselors, and psychologists should time to time evaluate these skills and plan various activities to inculcate these skills in them. For achieving the goal of social skill development, there is requirement of interaction between teachers and students of the class. Social adjustment gives the ability and the power to bring desirable changes in the state of existing environment. Here in order to develop a better insight into the possible relationship between social skills and social adjustment measures of adolescents, this research work is planned.

STATEMENT OF PROBLEM

"A study of social skills in relation to social adjustment of secondary school students"

OBJECTIVES

1. To study the social skills of secondary school students.
2. To study social adjustment of secondary school students.
3. To find out the relationship between social skills and social adjustment of secondary school students.
4. To compare the social skills of boys and girls of secondary school students.
5. To compare the social adjustment of boys and girls of secondary school students.

HYPOTHESIS

1. There is no significant relationship between social skill and social adjustment of secondary school students.
2. There is no significant difference in social skill of boys and girls of secondary school students.



3. There is no significant difference in social adjustment of boys and girls of secondary school students.

METHODOLOGY: Descriptive survey method was used in study.

SAMPLE : 100 secondary school students were selected for the sample of this study on basis of random sampling method.

TOOL USED

1. Matson's Evaluation of social skill with youngsters by Sharma (1997).
2. Social adjustment inventory developed by Dr. Roma Pal (1985).

Statistical Techniques used: Percentage, Correlation and Mean, Standard deviation, 't'- test were used to analyse the data.

MAJOR FINDINGS

1. Levels of Social Skills of Secondary School Students.

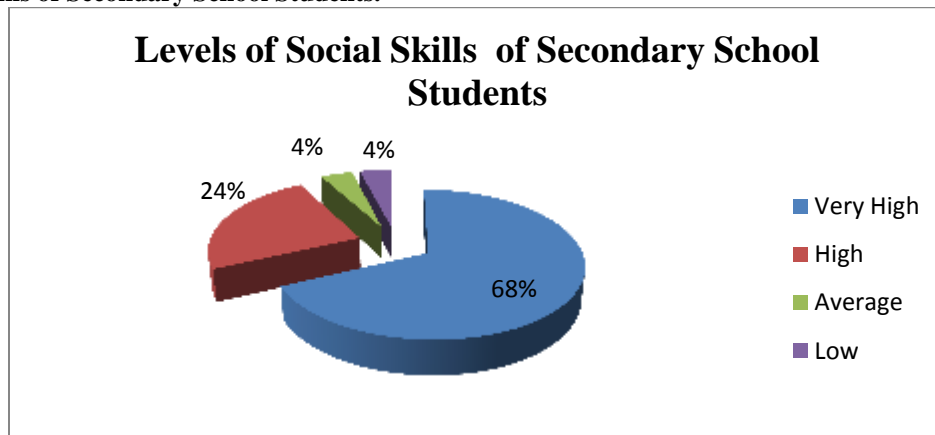


Figure: 1

Interpretation: Figure: 1 indicates that there were 100 secondary school students. It is evident from the above figure that 68% students have very high level of social skills. 24% students have high level of social skills. 4% of the students have average level of social skills. 4% of students have low level of social skills. This shows that majority of secondary school students have very high level of social skills.

2. Levels of Social Adjustment of Secondary School Students.

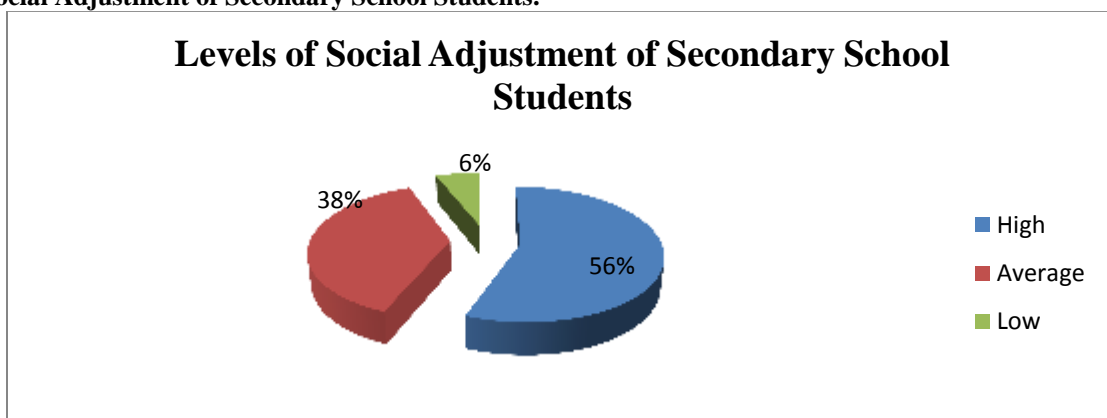


Figure: 2

Interpretation: It is revealed from the figure: 2 that 56% secondary students have high level of social adjustment in education. It means that more than half of students are well adjusted in social aspect. 38% secondary students have average social adjustment. 6%



secondary students have low social adjustment. It is concluded that more than half of the students at secondary school level are having high level of social adjustment. It is found that they are well adjusted in social environment.

3. Relationship between social skills and social adjustment of secondary school students.

Table: 1

Relationship between social skills and social adjustment of secondary school students

Variables	No of students	Correlation of Coefficient	Significance level
Social Skills	100	0.56	Positive Moderate correlation
Social Adjustment	100		

Interpretation

The table 1 indicates that the number of students is 100. It shows the correlation between social skills and social adjustment among secondary school students. The Pearson's correlation between these two variables is 0.56. So the null hypothesis, "There is no significant relationship between social skills and social adjustment among secondary school students" is rejected. It shows that social skills and social adjustment of secondary school students are positively correlated with each other. It indicates correlation between social skills and social adjustment is moderate and positive. It indicates social skills increase the level of social adjustment.

4. Difference between Boys and Girls of Secondary School w.r.t. Social Skills.

Table: 2

Difference between Boys and Girls of Secondary School w.r.t. Social Skills

Groups	N	Mean	SD	t-value	Level of Significance
Boys	50	171.38	30.7	6.166	Significant at 0.01
Girls	50	201.98	16.99		

Interpretation:

Table 2 shows that mean of boys and girls on social skills is 171.38 and 201.98 and where as S.D. is 30.7 and 16.99 respectively. It can be observed that the t-value is 6.166. It is found significant at 0.01 levels of significance which indicates that boys and girls are significantly differed in their social skills. So, the null hypothesis "There will be no significant difference between boys and girls of secondary school w.r.t. social skills is rejected. Thus, we can say that social skills are affected by gender. It can be concluded that girls found higher than that of boys of secondary school w.r.t. their social skills.

5. Difference between Boys and Girls of Secondary School w.r.t. Social Adjustment.

Table: 3

Difference between Boys and Girls of Secondary School w.r.t. Social Adjustment

Group	N	Mean	SD	t-value	Level of Significance
Boys	50	46.94	6.84	5.081	Significant at 0.01
Girls	50	52.16	2.44		

Interpretation

Table: 3 shows that mean of boys and girls on social adjustment is 46.94 and 52.16 and where as S.D. is 6.84 and 2.44 respectively. It can be observed that the t-value is 5.081. It is found significant at 0.01 levels of significance which indicates that boys and girls are significantly differed in their social adjustment. So, the null hypothesis "There will be no significant difference between boys and girls of secondary school w.r.t. social adjustment is rejected. Thus, we can say that social adjustment is affected by gender. It can be concluded that girls found higher than that of boys of secondary school w.r.t. social adjustment.

CONCLUSION

The paper examined the social skills among secondary school students in relation to their social adjustment. Social skills are universally widespread and each and every child has some degree of social skills. It is the responsibility of the teachers and parents to develop and stimulate social skill as early as possible in childhood, when students can still express them freely. The teachers should



design activities that will allow the child to express himself freely and help him to contribute something personal & valuable to the learning process. The teacher should establish an appropriate atmosphere in the classroom that will give each pupil the opportunity to enhance his/ her social skills. So, it is important to develop these skills in children, to motivate them so that they can respond favorably when faced with new situations and innovative ideas, while at the same time encouraging them to behave in a spontaneous, imaginative and original way. The main aim of education is encourage and develop all the capacities of the individual it makes no sense to leave out the stimulation and development of social skills in the child, for these capacities allow the child to be socially well adjusted. This paper concluded that social skills have influenced n social adjustment of secondary school students.

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RALTITREXED AND EDATREXATE DRUG MOLECULES AGAINST HUMAN PROTON COUPLED FOLATE TRANSPORTER TO CURE CANCER

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ABSTRACT

Proton pump inhibitors (PPIs) (e.g.: - rabeprazole, pantoprazole, omeprazole, lansoprazole, and esomeprazole) are widely used to treat gastroesophageal reflux disease and other acid-related disorders. Folic acid transport is important for proper cell proliferation. In human, folic acid is not synthesized in the body, it is obtained externally. Therefore, specific transporters are involved in absorption of folic acid, which is concentrated in intestine. Malignant cancer cells require this folic acid very frequently in large quantities for the rapid reproduction of cancer cell. In the current study, we compared different types of proton pump inhibitor drug molecules that may be potential candidates for preventing the absorption of folate by (hPCFT), its responsible for unusually large and frequent folate production. Each of these anti-drug candidates has 27 finalists based on previous studies. Among these competitors, leukovorin and nolatrexate molecules were found to be particularly associated with the hPCFT transporter's key active site loop ($G^{155}XXG^{158}$).

KEYWORDS: hPCFT /Drug target/ Molecular Docking/Screening of anticancer drug

INTRODUCTION

In higher organisms, the absence of folate synthesizing protein indicates the presence of multiple folate transporters by protecting exogenous folate between cells and compartments such as mitochondria, cytoplasm, plastids, and vacuoles. Because folic acid is a hydrophilic molecule, it does not diffuse through biological membranes. Thus, in mammals, placental cells have adapted to a healthy transport system for cellular uptake of folate cofactors.

Genetic molecular and biological investigations reported two transporter families for classification of transporter i.e., ABC belong to general primary active transporters and are introduced in transportation of primary active macromolecules whereas MFS family functions in transportation of secondary active macromolecule in response to chemo-osmotic ion gradient.

MFS family of transporter are involved in transport of various collections of substrates like sugars, amino acids, nucleosides, sugar, organic phosphates and vitamins in antiport, symport and uniport manner. It is among the largest active secondary transporter family found in bacteria, archaeobacteria and eukaryotes. The basic fold of MFS protein is 12 transmembrane helices with two 6 helices bundles made up of N and C terminal homologous domain. To figure out the mechanism of membrane transport, it is important to analyse the protein structural information. Accordingly, structural predictions have relied on comprehensive array of biophysical and biochemical approaches along with structural modelling. (Hanson, A.D. and Roje, Folic acids and folates: the feasibility for nutritional enhancement in plant foods. Journal of Science of foods and Agriculture, 80(7), pp.795-824, 2000.)

There are basically three types of folate transporter: (RFC), (PCFT) and (FRs). It is located on chromosome 21q consisting of 591 amino acids. It is mainly expressed in eukaryotes like humans and rat tissues. Being an organic secondary active anionic antiporter, it functions in uphill folate transport from blood into peripheral tissues by utilizing the high phosphate gradient. It is proved to be major facilitator system of folate in mammalian cell and tissue where it performs absorption process across intestinal and colonic epithelia. There are two more members of SLC19A1 i.e., SLC19A2 and A3 which functions in transportation in thiamine with 40% homology with A1. Folates have more affinity to transport through this transporter than folic acid and the activity of transportation is higher at neutral pH 7 but the activity constantly decreased below pH7. Human RFCs is N- glycosylated at Asn58 in loop domain connecting TMD1 and TMD2 Inactivation of RFCs in embryo is characterised by the folate deficiency and disorder. Structurally, three-dimensional structure of countable RFCs is available including bacterial (lacY) lactose/proton symporter. (Zhao, R., Matherly, L.H. and Goldman, I.D, Membrane transporters and folate homeostasis Expert reviews in molecular medicine, 11, 2009.)



MATERIAL AND METHOD

Identification of drug target

They are collectively an antiporter, symporter or uniporter system. They are found in different forms such as parasite Leishmania it is in form of FT1 and FT5 proteins, Slr0642 in *Synechocystis* and At2g32040 in *Arabidopsis* for transportation of folates in cells. The pteridine salvage by the help of bipterin transporters and folate transporters for the uptake of unconjugated bipterin and conjugated folate by the help of pteridine reductase enzyme. Which reduces oxidized bipterin to dehydration & tetrahydrate. Data provided the strong evidence for an unexpected complexity in mechanism employed to regulate pteridine at both RNA and protein levels (Mark et al 2000). Efforts to improve cancer and malaria treatment by modifying the genes playing role in folate pathway in mammalian cell which flashes a new role in drug discovery in mammalian cell (Nzila et al 2005). Inhibition of DHFR and DHPR was strategic for development of drug against malaria but reports suggested the findings of other folate pathway genes as a potential target. IC1D1964 was a potent inhibitor of mammalian thymidylate synthase inhibiting malaria weekly. The computational approach in comparing available genomic sequence of bacteria and *Arabidopsis thaliana* using SEED Database and its tools. The approach signifies the presence of novel GTP cyclopyrrolone and folyl polyglutamate synthase and p-amino benzoate gene whereas FolQ gene was reported to be missing gene from bacteria and plants. This led to the opening of many approaches for the genomic analysis of bacteria and plants (Laggard et al (2007). The prevalence global data for determination folate deficiency differing in different geographical distribution (Erin et al (2008). Data was collected from PubMed and vitamin and mineral nutrition information system at WHO. Out of 34 countries studied South-East Asia and Europe was found to be the most deficient countries in relation to folate. Folate assessment survey plasma serum concentration (55%), erythrocyte folate concentration (21%). No relation between vitamin concentration and geographical distribution was found.

The 3D structure of carboxyatractyloside inhibited ATP/ADP carrier. Bioinformatics studies suggest the study of 11 mitochondrial carriers, one of nuclear coded membrane proteins transporting variety of solutes, across mitochondrial membrane. Structure of carriers led to identification of different carrier in mitochondrial membrane based on knowledge of substrate specificity using homology modelling and multiple alignment analysis (Palmeiri et al (2009). The biology of different receptors of major facilitator family including (RFC), (PCFT), (FR) (Larry et al (2014). Reports suggested ubiquitous expression of RCFT in mammalian cell and tissue whereas PCFTs induce its expression in intestinal absorption and transportation in central nervous system. The major role of RFCs was reported to occur in transportation of antifolates like methotrexate and paratrexate, loss of which result into the resistance of methotrexate. Mechanistic aspect of folate regulation under folate deficient conditions. Results showed the intestinal uptake of folate by proton coupled folate transporter under acidic pH which showed the maximum transport by PCFT under acidic conditions (Wani et al (2012). mRNA expression profile analysis revealed the elevated increase in proteins level of both PCFT and RFC transporters suggesting the involvement of transcriptional and translational mechanism in regulating the intestinal folate uptake during folate deficiency.

Role of PCFT in folate deficient rats where upregulation folate under acidic pH increases by PCFT across intestinal brush border vesicle. The increment in folate uptake was associated with increase in V max with no change in Km of folate uptake process (Wani et al (2012). This suggested the upregulation of folate increases with folate deficiency which increases the activity of folate transporters but decreases the substrate binding like antifolates. RFC is reported to express in mammalian cell where it mediates the transport of one of the antifolate, methotrexate on the other hand PCFT is reported to transport the other antifolate, pemetrexate as well as intestinal transportation of folate. Both are excellent transporters but work in different pH. reviewed on the main methods used for the investigation of ion channel proteins. Molecular Dynamics is regarded as one of the best approaches to investigate the structure and dynamics in biological system. It also helps to understand the biophysical alterations induced by mutants (Boukhaba et al (2017). Molecular approach aims to characterize the ligand-protein and protein-protein interaction which allow to predict the optimal orientation between target proteins and molecules where each pose receive a score depending on the ligand and target fitting. Some of the descriptors like geometric, hydrophobic, lipophilicity and solubility are tabulated by QSAR modelling.

**Find Ligand for Drug Repurposing**

S. No	Candidate Drug molecules & Proton Pump Inhibitors	Compound ID (CID) PubChem
Substrate	Folic acid	Conformer3D_CID_135398658
1	Myricetin	Conformer3D_CID_5281672
2	2-[(4-Aminobenzoyl) amino]pentanedioate-pABA-Glu	Conformer3D_CID_5103842
3	5-Methyl-THF (tetrahydrofolate)	Conformer3D_CID_135483998
4	Methotrexate	Conformer3D_CID_126941
5	Pemetrexed	Conformer3D_CID_135410875
6	Raltitrexed	Conformer3D_CID_135400182
7	5H-Pyrrolo[3,2-d] pyrimidine	Conformer3D_CID_577022
8	Aminopterin	Conformer3D_CID_169371
9	Colchicine	Conformer3D_CID_6167
10	Edatrexate	Conformer3D_CID_6917908
11	Leucovorin	Conformer3D_CID_135403648

Table: - 1 Drug Table**Molecular Docking Analysis**

In this we used the MGL docking tool for the docking analysis. In this the grid box had formed that helped in the cover the target site. Retrieval of proteins sequence of hPCFT Uniprot/PDB. Protein sequence information from database will be used for Clustal Omega EBI search for evolutionary Phylogeny analysis. Secondary structure will be determined using I-TASSER and structure inspection by using Pymol. Preparation of library of potential repurposing inhibitors for hPCFT. Preparation of 3D structure library of potential repurposing inhibitors for hPCFT from PubChem. Molecular interaction analysis of individual drug inhibitor candidate against drug by Auto dock Vina, Auto Dock Tool (ADT) and PyMol.

Screening of Potential Drug Molecules to Inhibit hPCFT

In recently hPCFT has been found to be inhibited by “myricetin” at a sustained mechanism (Yamashiro, T., et. Al, 2019). The Study of hPCFT myricetin sensitivity determine hPCFT segment involved in hPCFT – myricetin interaction revealed the segment from 83rd to 186th amino acid residue is directly involved in this interaction (Yamashiro, T., et. Al, 2019; Eudes, A., et al., 2010). Furthermore, the mutant G158 N- substituted hPCFT was found to be insensitive transformed to myricetin according to oppositely N158 G-substituted rPCFT was transformed to be sensitive to myricetin. Hence G158 of hPCFT acts as key residue for the These results indicates critical role of Gly158 in the myricetin sensitivity of hPCFT. Hence, we intend to screened potential drugs to inhibit the hPCFT on the basis of their stable molecular interaction with G158 residue of hPCFT.

Other Potential Drugs to Inhibit hPCFT

Pemetrexed is another excellent hPCFT substrate explain its demonstrated clinical efficacy for mesothelioma and non-small cell lung cancer, and prompted development of more PCFT selective tumor-targeted 6-substituted pyrrole pyrimidine antifolates that derive cytotoxic effects by targeting de novo purine nucleotide biosynthesis (Desmoulin, S.K., 2012). The Pemetrexed an antifolate that has been recently approved for treatment of mesothelioma and non-small cell lung cancer. DFD reduces MTD for methotrexate & raltitrexed ((located 50- fold), edatrexate (sevenfold), and pemetrexed (located 150-fold). Based upon lifespan extension, antitumor effect on methotrexate & edatrexate were greater in mice (L1210RFC) fed a folate- deficient diet (e.g., ILS: 455 and 544%, respectively) than in mice fed a standard diet (ILS: 213 and 263%, respectively). It was remarkably excellent. Regardless of dietary folate status raltitrexed and edatrexate were shown inactive in both mice containing L1210RFC and mice containing L1210MFR. This could be but due to high circulating plasma thymidine levels. Collectively, this study underscores that modulation of dietary folate status can provide a basis within which the therapeutic effect of antifolates may be further improved (Urquhart, B.L., et al., 2010). (hPCFT/SLC46A1) has been found to be recently potentially inhibit by myricetin. This raises a concern for malabsorption of folates in intestine. The colchicine, which is regarded as an inhibitor of vesicular-mediated endocytosis is observed to inhibit AP binding and AP- directed transport without affecting the basolateral transport.

Potential Drug Molecules to Inhibit hPCFT

Proton pump inhibitors are essential consideration group of drug candidates to screen antagonist for human PCFT. Hence the potential proton pump inhibitors are shortlisted and given here in table 2. These proton pump inhibitors are well known to inhibit



proton pumps and are potential drug candidates for Folate pumps in different species. Hence, we utilized these shortlisted drug candidates to test for their potential to inhibit the active site of human PCFT.

Raltitrexed and Edatrexate is the most potential drug against Cancer

The Binding energy of the Raltitrexed and Edatrexate was also comparatively lowest -8.2 and -7.9 kcal/mol respectively. These drugs cover the almost amino acids that is present on the protein (hPCFT) loop and block them active sites loop (THR-372, PHE-157, GLY157) and (GLY-155, PHE-157) of the molecules

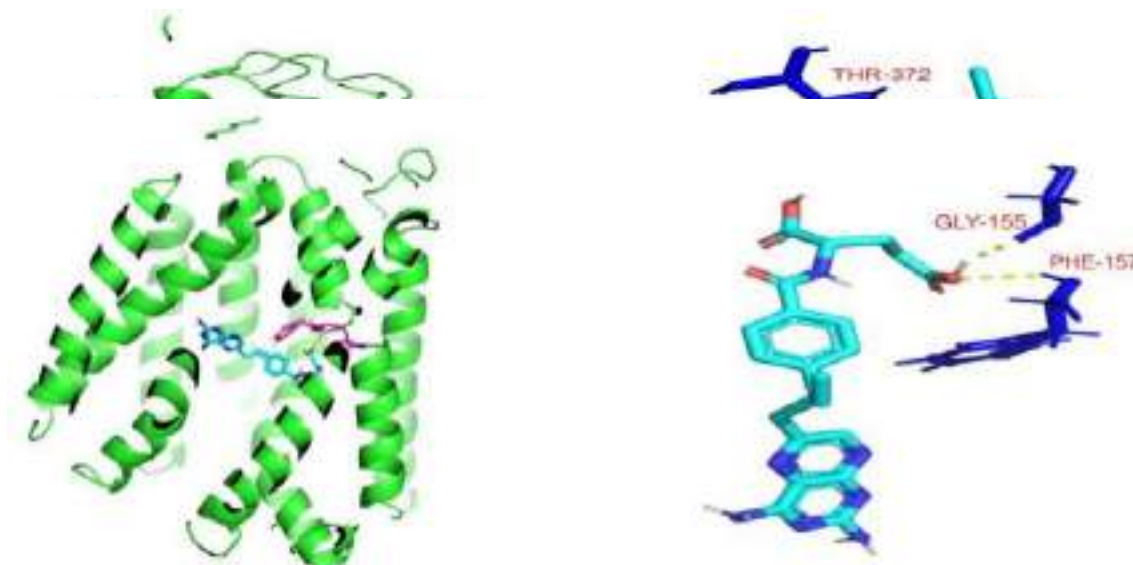


Fig: 2 Our target site is GLY-156 in PCFT. Raltitrexed is binding with site GLN-157, PHE- 157, THR-372 which is not far away from our target site and maybe can blocked the target site.

Fig: 3 Our target site is GLY-156 in PCFT. Edatrexate is binding with site GLN-155, PHE- 157 which is not far away from our target site and maybe can blocked the target site.

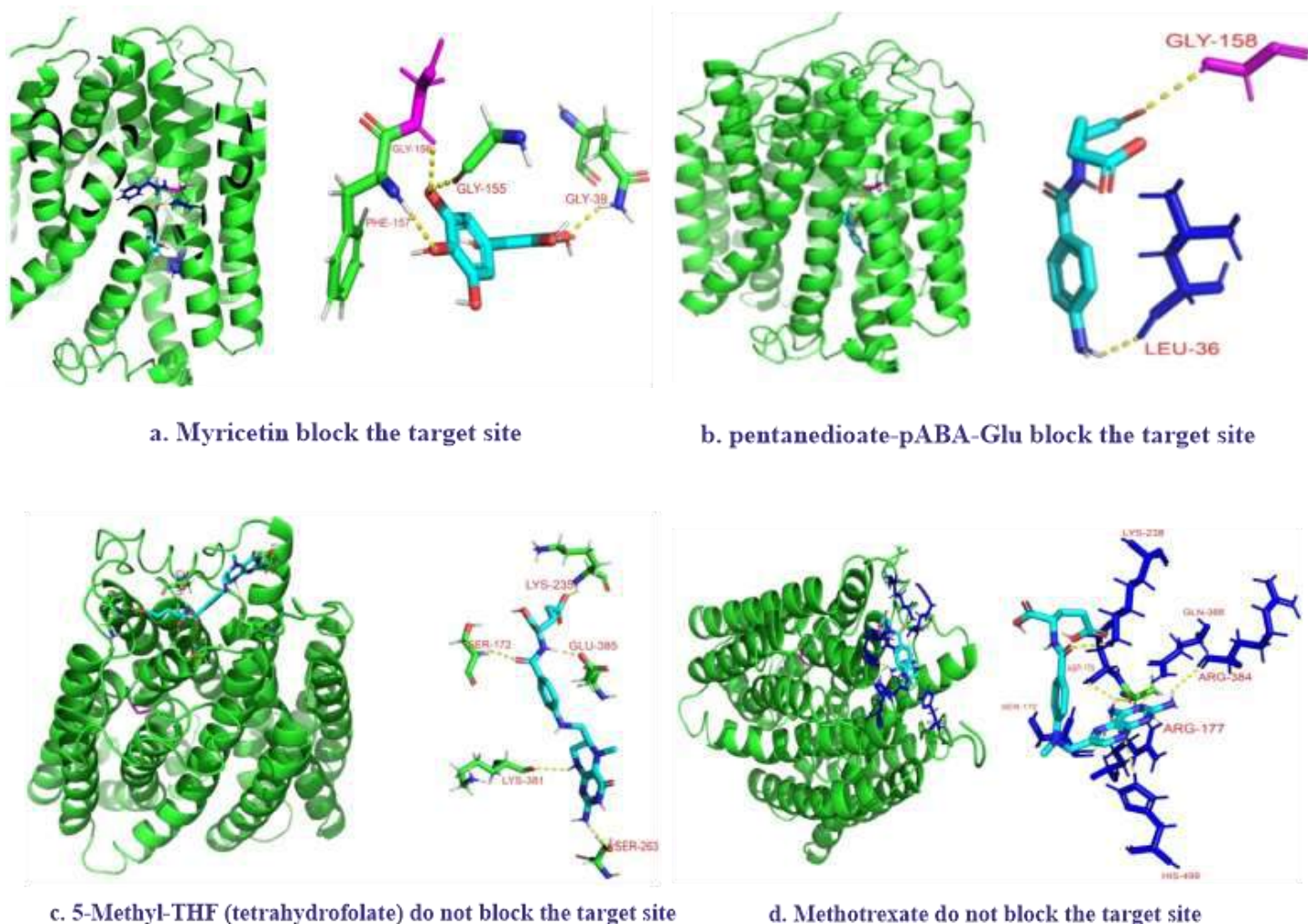


Fig:4

- Myricetin is binding with site GLY-156, GLY-155, GLY-39, PHE-157. Myricetin is binding with target site and blocking the transportation of folate in human body. It has perfect credibility to repress the cancerous cell in human body but it has also negative effect on normal human health because it's blocking the folate which is also required for normal day life.
- 2-[(4-Aminobenzoyl) amino] pentanedioate- pABA-Glu is binding with site GLY-158 and LEU-36 which is not our target site and not blocking the target site.
- 5-Methyl-THF (tetrahydrofolate) is binding with site GLU-385, SER-172, LYS-235, LYS-381, SER-263 which is not our target site and not blocking the target site but covering whole protein.
- Methotrexate is binding with site GLN-388, SER-172, ASP-170, ARG-384, ARG-177, HIS-499, which is not our target site and not blocking the target site but covering whole protein.

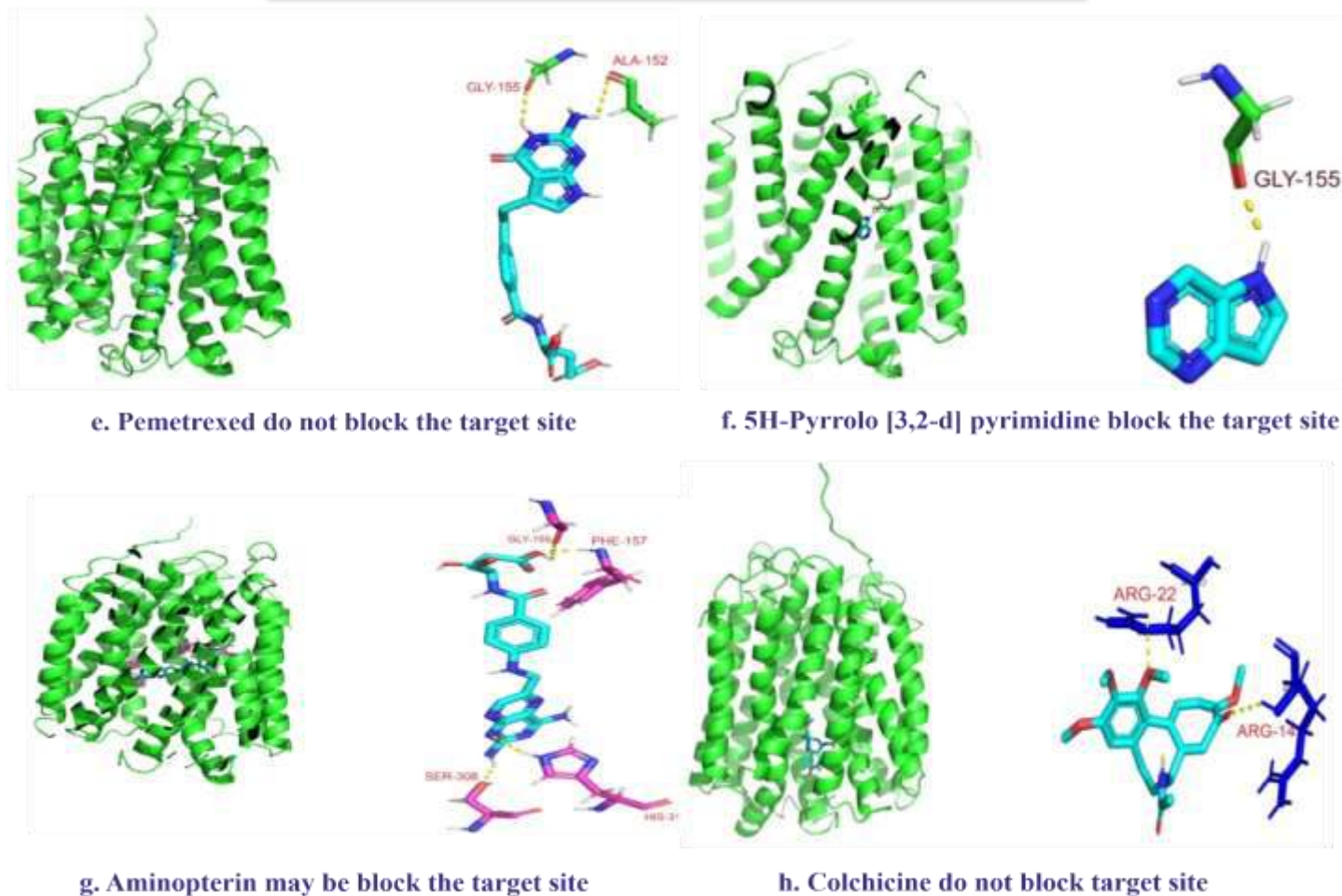
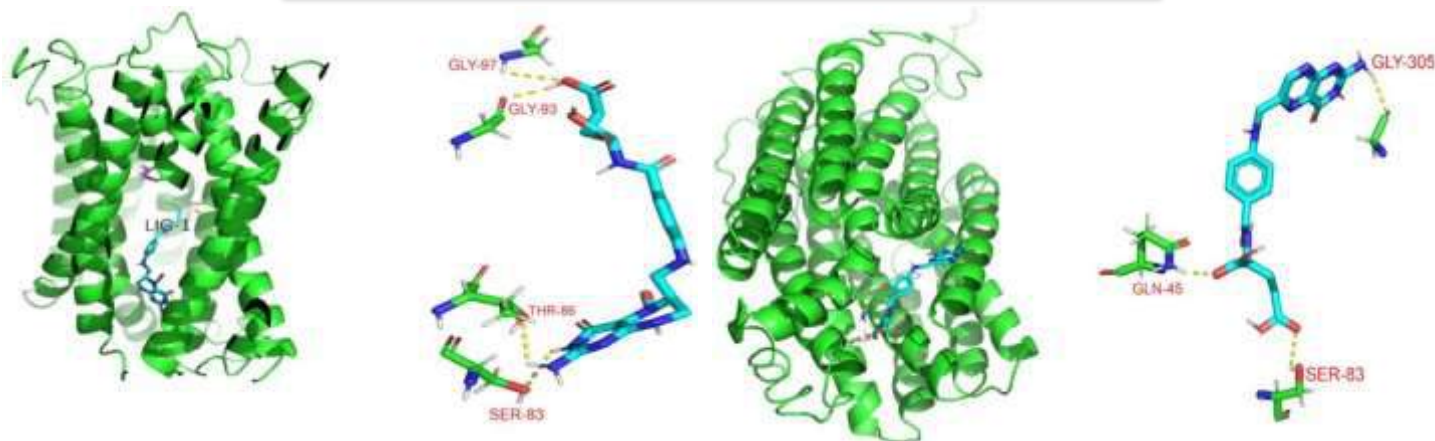


Fig:5

- e. Pemetrexed is binding with site GLY-155, ALA-152 which is not far away from our target site maybe blocked the site.
- f. 5H-Pyrrolo[3,2-d] pyrimidine is binding with site GLY-155 which is not far away from our target site and maybe can blocked the target site.
- g. Aminopterin is binding with site GLY-155, PHE-157, SER-308, HIS-312 which is not far away from our target site and maybe can blocked the target site.
- h. COLCHICINE is binding with site ARG-22 and ARG-14 which Is not binding on our target site.



i. Leucovorin do not block the target site

j. Folic acid binds and covering whole protein hPCFT

Fig:6

- i. Our target site is GLY-156 in PCFT. Leucovorin is binding with site GLY-97, GLY- 93, THR-86, SER-83 which is not far away from our target site and maybe can blocked the target site.
- j. Folic acid binds with sites GLY-305, GLN-45 and SER-83 and covering whole protein PCFT means folate transportation is blocked by folic acid by this cancerous cell in human body cannot absorb folate in rapid manner so it can help in reducing the generation of cancerous cell.

S.No.	Drug Molecules	Binding Energy(kcal/mol)	Blocking amino acids of active site
Substrate	Folic acid	-6.8	GLY-305, GLN-45, SER-83
1	Myricetin	-7.6	GLY-155, GLY-39, GLY156, PHE-157
2	pentanedioate-pABA-Glu	-6.1	GLY-158, LEU-36
3	5-Methyl-THF (tetrahydrofolate)	-5.9	LYS-235, GLU-385, SER-172, LYS-381, SER-263
4	Methotrexate	-6.7	LYS-238, GLN-388, ASP-170, ARG-384, SER-172, ARG-177, HIS-499
5	Pemetrexed	-7.8	GLY-155, ALA-152
6	Raltitrexed	-8.2	THR-372, PHE-157, GLY157
7	pyrimidine	-4.4	GLY-155
8	Aminopterin	-7.4	GLY-155, PHE-157, SER-308, HIS-312
9	Colchicine	-6.7	ARG-22, ARG-14
10	Edatrexate	-7.9	GLY-155, PHE-157
11	Leucovorin	-7.5	GLY-97, GLY-93, THR-56, SER-83

Table: - 2 Drug Table Blocking amino acids of active site

CONCLUSION

Folic acid transport is important for proper cell proliferation. In humans, folic acid is synthesized in body, so it is obtained externally, which are densely crowded in intestinal region. For the malignant cancerous cell these folates are crucially required on very frequent and enormous rate of fulfil the rapid proliferation of the cancerous cell. In the present study we have comparatively different PPI antagonist drug molecule which could be a potential candidate to inhibit the folate uptake by the (hPCFT) responsible to procure folate in abnormally enormous and frequent rate. These drug antagonist candidates finally include 27 as shortlisted based on previous studies. Out of these antagonist drugs, Raltitrexed and Edatrexate molecules were observed to specifically bind to the key active site loop (e.g., G155XXG158) of the hPCFT transporter. The Binding energy of the Raltitrexed and Edatrexate was also comparatively lowest -8.2 and -7.9 kcal/mol respectively. Hence from the present study we conclude that the Raltitrexed and



Edatrexate antagonist drugs are the most potential inhibitory candidates for folate transport. We further tested the Raltitrexed drug candidate for its stable binding within the cavity of the hPCFT, and the results show potential inhibitory activity of the Raltitrexed drug candidate with stable binding to the hPCFT core binding site for a duration as long as 124 nanoseconds. Hence, overall, in the present study we may wind up that the Raltitrexed drug candidate would be a highly potential drug to inhibit folate up take through proton-pump hPCFT and hence the drug could be a potential anticancer drug to limit the proliferation of cancerous cells. Although in vivo and human trials would be an essential obligation to the said conclusions, which may be addressed in future prospects of the present study.

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LIFE SKILLS AND EDUCATIONAL ADJUSTMENT AMONG ADOLESCENTS-A STUDY

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ABSTRACT

The present study was investigated relationship the Life skills and educational adjustment among adolescents' students Sonipat District. Descriptive survey method was used. The tools for data collection in scale on life skills standardized by Nair A.R.K. Subasree R& Ranjan Sunitha (2010) and Educational Adjustment standardized by Seema Rani and Dr. Basant Bahadur Singh. Data was analyzed using mean, mode, median, sd, t-test. The findings of the research is that there is no significant difference between Boys & Girls, Govt. & Private and Rural & urban students. Life skills & Educational Adjustment is the important part of life. It help individual need and help better life and dealing with issues as student life skills improvement and building citizen.

KEYWORDS: Educational Adjustment, life skills, adolescents.

INTRODUCTION

The present study was defined to be the educational adjustment and life skills of adjustment. Life skills are helpful in the academic adjustment of adolescents. The aim of the present study was to look at the effect of skill on educational adjustment. The aim of the present study was to see the impact of life skills and educational adjustment among adolescents. The present time of adolescent clearly show that the condition of our youth has significant rise in the problems, faced by the adolescents. For example serious emotional disturbance has increased. The studies clearly illustrate the increase in aggressiveness, suicidal cases, drug use and depressive cases among adolescents. This give us the clear image of the struggles that adolescents go through the problem they face. One best practice model for contributing to the developed of adolescents is a life skills approach.

Life skill refers to the skills you need to make the most out of life. Life skills are usually associated with managing a living better quality of life. They help us to accomplish our ambitions and live to our full potential. Any skills is usefull in your life can be considered a life skills. Life skills are a set of human skill gain via technology or direct experience that are use to handle problem and question commonly encountered in daily human life.

Dimensions of life skills:

1. Decision-making
2. Problem solving
3. Critical thinking
4. Creative thinking
5. Effective communication
6. Interpersonal relationships
7. Self awareness



Educational Adjustment it refers to an individual adopting emotional relationship within and with other people both inside and outside the school says reflected in the individual's attitudes and behavior. Education is the process of acquiring knowledge, skills, values beliefs and habits with make a person good citizens. Educational adjustment means how an individual is imparting his duties towards his education and whether he is able to get his goal or not. If is an individual is unable to get good marks in the examination, he will face the problem to adjust himself in that education environment while those students you get good marks in the examination feel better adjust in their educational setup. Satisfaction of the child with the behavior in of his class fellow, teachers and head of the institution, methods of teacher, rule and regulations, time management, Co curriculum activities influences his adjustment.

REVIEW OF RELATED LITERATURE

Rabindranath, Thomas, Sharry (2012) conducted on a “Importance of life skills Training for Corporate Sector. This study find out that Human resources with positive attitudes towards life and germane skills for advanced knowledge economy that are publicly responsible and Accountable is becoming important high today’s momentum humanity .It is important that we mobilize skills such as personal management and people management skills which are necessary for adequate Functioning which help us to steer our life towards more positive behavior and well being.

Gulhane(2014) was Conducted is a study on “Life Skills Development school Education”. The intervention has tried to find out is part of the life skills program there are close links between the department and their subjects, including science. RS, thinking skills current affairs and Games/PE. Life skills also developed through assemblies, which are led by individual members of staff and by form or other groups. A life skill and courage get the state to think rationally both inside and outside the classroom.

Agric (2014) was conducted a study on “impact of Intervention On Life skills Development Among ADOLESCENT girls”. The intervention has tried to find out characterized by Rapid psychological change and maturation. These are also risk taking, solving their own problem, taking decisions on crucial issues. Thus it is a turning point in one’s life and a period of increased potential.

R. Zakia ,Ayelish MC Garvey (2001) the study was conducted on education of American youth is widely considered an important goal in the United States. The issues of how American youth are faring in their schooling referred here as their educational adjustment, educational functioning ,both compared to youth in other countries, has received a great deal of attention in public debates. Indeed there are strong argument for why we should place such as significant focus on Educational Adjustment. Level of academic achievement during Adolescent and educational attachment later in life are strong prediction of a variety of indicators of well being in adulthood including but no limited to indication of economic functioning such as education.

Gill (2014) investigated a study on Educational, social and Emotional adjustment of boys and girls of visual handicapped student of a special school at Faridabad. The significant difference between educational adjustment of the special school student belonging to boys and girls. There was no significant between the Emotional adjustment of special school students belonging to boys and girls.

JUSTIFICATION OF THE STUDY

The purpose of the study we are define life skills and educational adjustment in adolescents students. In this study to examine the effect on students academic achievement, motivation, social adjustment, behave personality. This study is main objective of how life skills and educational adjustment in help us to adjust in society of adolescent students. Life skills is an essential part of being able to meet the challenges of every day. This research paper is focused on life skills education and benefit of imparting life skill and adjustment in education developing social, emotions, thinking is adolosents life. The mail purpose of the study is to know the various factor emphasize the adolosents students.

STATEMENT OF THE PROBLEM

“Life skills and Educational Adjustment among adolescents A-study.”

OBJECTIVE OF THE STUDY

The following are the objectives of the present study:

1. To find out whether there is any significant difference among adolescents student in there life skills with regard to the background variables namely: (1) Gender (Boys and girls), (2) Nature of school (Government and private) and (3) locality of school (Rural and urban).
2. To find out whether there is any significant difference among adolescents student in their educational adjustment with regard to the background variables namely: (1) Gender (Boys and girls), (2) Nature of school (Government and private) and (3) locality of school (Rural and urban).
3. To find out whether there is any significant relationship between life skills and educational adjustment students.

**NULL HYPOTHESIS**

The following are the hypotheses formulated for the present study:-

1. There is no significant difference among adolescents students in their life skills with regard to the background variables namely: (1) Gender (Boys and girls), (2) Nature of school (Government and private) and (3) locality of school (Rural and urban).
2. There is no significant difference among adolescents students in their educational adjustment with regard to the background variables namely:- (1) Gender (Boys and girls), (2) Nature of school (Government and private) and (3) locality of school (Rural and urban).
3. There is no significant relationship between life skills and educational adjustment of adolescent students.

METHODOLOGY OF THE RESEARCH

The present study required data for analysis. Data is collected through survey method and descriptive method.

SAMPLING OF THE RESEARCH

The sample for this study, we take total 200 students of Sonipat distt. In which the basis of Gender 50 are boys and 50 are girls. The basis of nature of school 50 Govt. and 50 private. The basis of locality 50 are rural and 50 are urban.

TOOLS TO BE USED

The tools used standardized scale by **life skill by Nair A.R.K. Subasree R, Ranjan Sunitha.at(2010)**
Educational Adjustment by Seema Rani and Dr.Basant Bahadur Singh .

ANALYSIS AND INTERPRETATION OF THE DATA

Hypothesis-1 Comparison of life skills basis of Gender among Boys and Girls students.

	Gender	Mean	Mode	Median	S D	T- value	Remarks at 5% level
Life skills	50 Boys	255	342	342	66.65368615	0.406347489	Accepted
	50 Girls	206	309	336.5	64.026032787		

Hypothesis -2 comparison of life skills basis of nature Govt. and private students.

Variable	Nature	Mean	Mode	Median	S D	T value	Remarks at 5%level
Life skills	Govt 50 Boys	243	342	343	61.76322134	0.986093885	Accepted
	Private 50 Girls	294	342	341.5	74.94821069		

Hypothesis -3 comparison of life skills basis of locality Rural and Urban Students.

Variable	Locality	Mean	Mode	Median	S D	T value	Remarks at 5%level
Life skills	Rural 50 Boys	254	342	343	78.67572558	0.70032574	Accepted
	Urban 50 Girls	206	309	341	83.7672212		



Hypothesis -4 comparison of Educational Adjustment basis of Gender among Boys and Girls students.

Variable	Gender	Mean	Mode	Median	S D	T- value	Remarks At 5% level
Educational Adjustment	50 Boys	22	36	40	8.593210419	0.528002528	Accepted
	50 Girls	25	40	39	8.459362643		

Hypothesis -5 comparison of Educational Adjustment basis of nature Govt. and private students.

Variable	Nature	Mean	Mode	Median	S D	T value	Remarks At 5% level
Educational Adjustment	Govt 50 Boys	22	32	43.5	10.93895865	0.290373055	Accepted
	Private 50 Girls	25	38	39	10.11648483		

Hypothesis -6 comparison of Educational Adjustment basis of locality Rural and Urban Students.

Variable	Locality	Mean	Mode	Median	S D	T value	Remarks at 5% level
Educational Adjustment	Rural 50	22	36	40	9.787872546	0.557142781	Accepted
	Urban 50	25	38	39	9.562020963		

Conclusion

In the end we find out the life skills and Educational Adjustment are part of adolescents students life. It has positive change of through life skills and Educational Adjustment program moreover the life skills and Educational Adjustment result may also help the development and positive learning environment for adolescents students. It is also suggest that there is need to different life skills and Educational Adjustment based program for students, then develop balanced personality.

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INDUSTRY 4.0 AND ITS IMPACT ON INDIAN ECONOMY

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ABSTRACT

At present, developed economies like Germany, Japan, the USA, and Singapore have embraced Industry 4.0 to increase their manufacturing competitiveness. At present, India lags behind its global peers in Industry 4.0 adoption. However it has been started to implement these technologies into its industrial process and it also has created lots of positive impacts also. From the beginning of civilization, human beings have tried to increase their capacity and power. At first they were using equipment made of wood or rocks but with the advancement of science they explored modern and efficient equipment, and this process is going on. Machines are one of the inventions of humans. Use of machines was the cause of first industrial revolution. It was termed as a revolution because it not only increased production but also brought significant social and economic changes. For example, in 1790s the French revolution took place, which coined new ideas like Equality, Liberty and Brotherhood, the first industrial revolution, which came to pass a few years after the French revolution, infused those ideas. It means industrial revolutions have a huge impact on our society, not only society but it also affects the world economy. With this backdrop the present paper has made attempt to explain the impact of industry 4.0 on Indian industry

KEY WORDS: Industry 4.0; Manufacturing Sector; Indian Economy; Economic Growth; Industrial Development

INTRODUCTION

From the beginning of civilization, human beings have tried to increase their capacity and power. At first, they were using equipment made of wood or rocks but with the advancement of science they explored modern and efficient equipment, and this process is going on. Machines are one of the inventions of humans. Use of machines was the cause of first industrial revolution. It was termed as a revolution because it not only increased production but also brought significant social and economic changes. For example, in 1790s the French revolution took place, which coined new ideas like “Equality, Liberty and Brotherhood”; the first industrial revolution, which came to pass a few years after the French revolution, infused those ideas. It means industrial revolutions have a huge impact on our society, not only society but it also affects the world economy.

Today, technology has advanced and we are moving towards the Fourth industrial revolution. New technical breakthroughs like Artificial Intelligence, Internet of things, Big Data etc. will change the entire scenario of current industry. Industry 4.0 is going to change the way we work, the way we live, the way we think and the way we relate things with other. One of the major components of industry 4.0 is Artificial Intelligence (AI). It enables machines to think, learn and in decision making also. It is expected that AI will make a revolutionary change in space industry as well. In the near future, robots will be sent to space instead of a man and hence will provide new breakthroughs in space science. Not only the space industry but every sector from agriculture to healthcare and education is going to be benefited by AI. On the one hand, AI will be used to tackle challenging problems like security, fighting terrorism, surveillance, traffic control etc and on the other hand, it will bring dynamic changes in banking, airlines, medical technology and education system. By the use of nanotechnology, we can conduct critical cancer operations also.

In future normal class rooms are going to be replaced by smart classrooms which will ensure better learning for students. Although now this technology is less affordable, it is expected that it will be cheaper with the advancement of technology. Not only this, AI and machine learning these skills will be installed in future generation syllabus because learning about these is very essential for the next generation. There is also a negative side of this technological advancement. Studies say that robots will turn humans lazy. Although human life will be longer due to advancements in healthcare, it is also true that humans will become less fit and lazier. In such a situation, those who use technology properly to maintain a healthy life will be more benefited than others. Human life costs a lot. That's why in the future generation armed forces we may find robot soldiers. But for countries like India where 10 lakh people are employed in armed forces, this will create a major unemployment situation. Also imagine if countries will start using robots to fulfill their expansionist policy then it will be a major threat to world peace and may cause a third world war.



Industry 4.0 Technologies and their Industrial Applications

Internet of things (IOT) is another technical breakthrough where machines can communicate with each other. IOT with the AI combination will transfer factories into smart factories, cities into smart cities, cars into smart cars and homes into smart homes. If so happens, then it will reduce human efforts to a minimum. Big data analytics is another crucial component of Industry 4.0. It is basically developed to gather information and data of consumers so that producers can manufacture proper items and services for them. In today's digital world, data is very important for us. Just imagine, if this huge data is processed properly then we will witness magical changes around us. We will get proper on-time services, hence it will save both money and time. Actually, Big Data will completely transform the governance system. It will make it more transparent and efficient. Policy implementation is a major headache for governments. It is expected that Big Data with AI will work to simplify this problem. The government will be able to reach every needy person and no one will be excluded from justice. It means Big Data ensures inclusive socio-economic development in the future.

Industry 4.0 Technologies and Data Privacy

According to the UN, privacy is one of the human fundamental rights. Can we ensure privacy while installing this technology? Is Industry 4.0 going to ruin our fundamental rights? Actually, when we are considering Big Data we are considering data of millions of TB. In such huge amount of data, personal data doesn't matter much. But this data can be used to influence people politically and may hamper democratic processes also. This data, if not properly guarded, may cause civil wars or riots. So this is going to be a big challenge in the future. Industrial revolution puts a big impact on world economy and changes its basic structure. For example, the first industrial revolution transformed the agrarian economy into the manufacturing economy; the second industrial revolution reshaped it into the service-based economy and during the IT revolution the world's economy became a knowledge-based economy. But in this advancement, if one had to sustain he/she has to learn new skills and techniques. For example, when tractors and electric pumps were introduced in the farming sector, only those farmers could sustain well who trained themselves in accordance with modern technology and the rest failed.

Impact of Industry 4.0 Technologies on Human and the Workforce

A huge question arises when we think about artificially intelligent machines: "Will there be any job left for humans?" Actually, jobs are not dying but they are evolving. It is obvious that Industry 4.0 will replace some jobs, but is also creating new jobs like big data analytics, VR designer, blockchain auditor, social media reporter, drone operator space visit guide and many more. It is expected that high-skilled and low skill jobs will stay as before, but middle-tier jobs will be replaced by AI robots. This is known as job polarisation in the economic terms. If workers want to sustain then they have to learn new technological skills. Researchers of Oxford University have found that jobs which are related to manual dexterity, high cognitive skills and social skills are difficult to be computerized, and workers should focus on developing these skills. Doctors are going to be replaced by AI robots in future but if a doctor is trained with hospitality skills and caretaking skills, then he/she will be preferable over a robot-doctor. It means jobs are going to be knowledge-centric and talent centric. A construction worker has to learn something about electronics apart from construction skills if he/she wants to build an automated smart home where sensors are used. Hospitality, condolence, politeness these are some qualities which should be learned as these will value add our character.

In the recent times, human race are heading towards a Gig economy. Gig means not continuous. It is predicted that normal continuous jobs will be reduced and these will be replaced by contractual jobs. If there will be no permanent jobs then there will be no paid holidays and no insurance schemes and also no fixed income. It may create unemployment like situation but I think gradually it will become part of our habit. So the beginning period is going to be tough and it is also expected that the revolution may slow down the world economy for a small period. So we should get ready for it. It is often observed "lack of reciprocity between technology and skill results in social inequality". Those who learn new skills time to time and update their work with new technology will succeed and for the rest, fourth industrial revolution will be a big challenge. Actually, it depends on you whether Industry 4.0 will be a boon or a curse.

Economic Benefits Provided by Industry 4.0 Technologies

Industry 4.0 technologies will help in the economic regeneration by 2025 enabling enterprises to revamp India's financial status in the post-COVID era besides acting as game-changers. The role of corporations through AI is going to be key for the comeback of the Indian economy post-pandemic. New-age technologies such as block chain, big data analytics, Internet of things (IoT), advanced manufacturing, quantum computing and AI are set to give India a possibility to engrave itself a striking uniqueness as an "International nucleus" in the near future. As AI functions for "digital inclusion" in India, it is expected to have a ripple impact on economic prosperity and growth. Analysts foresee that AI can help add up nearly \$957 billion to the Indian economy by 2035 and by 2025, AI can add over \$500 billion and nearly 20 million jobs to the Indian economy. The Indian government is also in the process of implementing a robust legal framework governing the data of the country apart from constructing a data-driven society through AI that presents endless prospects to empower people, enhance society and also boost the ease of doing business. India through its AI strategy, constituting an extensive pool of AI workforce and an emerging startup ecosystem, has a remarkable chance



to be a prominent contributor to AI-driven resolutions that can further transform agriculture, healthcare, manufacturing, education and skilling thereby impacting the economy positively to a considerable extent. The adoption of AI in various sectors of the economy is seen to have produced favorable returns by lessening time and risk.

Government Initiatives to Speed up the Implementation of Industry 4.0

Recently, the Ministry of Commerce and Industry has set up a Taskforce on AI to kick-start the usage of AI for the country's economic shift. Nonetheless, AI adoption has remained at a developing stage. Therefore, the Indian government should consider establishing a separate "Industry 4.0 Ministry" for coordinating all new age technology related activities. For instance, the United Arab Emirates (UAE) in 2017 became the first nation in the world to create the post of Minister of State for AI. Today, governments globally are also taking measures to be part of the AI-led digital economy, which is assessed to contribute roughly \$15.7 trillion to the global economy by 2030. Considering India's present situation, the country is on the verge of a massive opportunity for both economic advancement and gain in the common well being of its citizens. "Inclusive economic growth" can make India the best playground for creating world-class and state of the art technology solutions. For this, the government through its annual budget must consider allocating more for Research and Development (R&D) in various sectors and also establish R&D departments in various educational institutions and universities across the country. India through General-purpose technologies (GPTs) can also influence the whole economy where GPTs have the possibility to drastically transform societies through their effect on the already existing economic and social arrangements.

Growth Potential of Industry 4.0 in Indian Economy

The adoption of AI is not confined to businesses alone, while economies have also shifted their emphasis on creating their AI capacities as a tool to boost growth where developed nations are already in the race and India as an aspiring future superpower is set to enter the AI race. Amidst the accelerated adoption of AI-based technologies, India seems to stand at the ridge of Industry 4.0. Therefore, it would be a convenient shifting for India to create its AI abilities despite the transnational digital divide broadening even more. From the first industrial revolution until the rise in the IT revolution, the world has stood to benefit more and as per experts, AI like any other new technology in the past will produce more jobs than it destroys. Still, it is seen that the "Initial adoption of technology" has barriers for developing economies where restricted access to Industry 4.0 can broaden the income inequality, and the transformation stage of adoption is presumably to replace some jobs before it produces more jobs. While the influence of AI on the gross domestic product (GDP) and productivity is impressive, studies have also demonstrated the harmful effect of AI on employment. McKinsey Global Institute indicated that intelligent mechanisms and robots could eliminate nearly 30 per cent of the global human labor by 2030. Also, with the rise in unemployment, this transformation could become quite difficult though in the past, new technologies have demonstrated to be worthwhile in the long-term, the short-term failures cannot be justified. Nevertheless, India still lags on essential indicators of AI development despite possessing increased levels of entrepreneurship, robust corporations and a skilled pool. Therefore for the betterment of the essential AI indicators a balanced approach, innovative local solutions and top-down policy making should be put forth. Also, the enhanced role of government along with the private sector will be instrumental in directing AI to create equitable development. Furthermore, the continued innovations and collaborations by Public-Private Participation (PPP) are necessary to lessen the cost of modern technologies, which can help the larger population thereby driving the "digital revolution". However, India should also mainly consider improving its "hardware sector" to help redress bottlenecks since the country still lags behind which is vital for the Indian economy.

CONCLUSION

As India is expected to have the world's youngest population by 2030, the country will account for nearly 30 per cent of the global workforce. Therefore, AI in this way can dramatically boost the productivity of the average worker to match the level of today's top performers. There is also a further need to promote "Scientific temperament" amongst the people in the country about the new age technologies besides taking the ethics and security of Industry 4.0 into consideration. In this context, the "National strategy for AI" in India has recently recommended establishing ethics councils for sector-specific concerning privacy, security, and ethics. Industry 4.0 can also help the country to achieve the Sustainable Development Goals (SDGs) that can drive the Indian economy further. Henceforth the Indian economy and society in the long run is definitely poised for a sea change and the valiant dream to make India a \$5 trillion economy by 2025 can be accomplished through the adoption of Industry 4.0.

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AESTHETIC VALUE OF RE-USE WASTE MATERIALS AS A PANACEA FOR ENVIRONMENTAL PROTECTION

(An Appraisal of Oligbinde's Creative Works)

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ABSTRACT

Discarded plastic and bottle tops are unwanted and seen as unusable materials that the initial user has no further use for or no longer considers of any significant value to retain. They are considered waste, thus, discarded after primary use. The indiscriminate disposal of such waste amounts to an alarming volume of them, however, wastes can be managed through recycling, repurposing and if well managed, a man stands at a vantage point economically, socially, and more importantly aesthetically – which affects our health on short and long terms. This paper examines the plastic sculptures of Oligbinde Rotimi with the concept of turning plastic waste into objects of aesthetic made from discarded plastics that are purposively selected for formal and contextual analysis. These works were produced as a source of inspiration for others to gainfully redeploy any plastic they see within their enabling environment to lay their hands on and thereby save the planet committed to us. Photographs of works are taken and the procedures involved in executing the works were highlighted.

KEYWORDS: *Aesthetic, Discarded plastic, Repurposing, Waste, Recycling, Environment.*

1.0 INTRODUCTION

The volume of discarded waste materials is threatening to drown civilization on the globe. Dump sites, markets, open sewage, roadsides, and streets across cities in Nigeria were flooded with discarded materials. Meanwhile, the dangers of having these discarded materials around can also be injurious to our health and even cause damage to the ozone layer, thereby causing havoc in the community. To avoid the dangers of having these discarded materials around, this study aims at exhibiting the re-purposing of discarded plastics cited outdoor where they would be freely accessible by the general public.

Despite the long use of plastic for domestic purposes, packaging, building, and construction, furniture, transportation, medicine and health, electronic and electrical, and agricultural; there exists a large number of literature on the usage of discarded plastics as scholars have written extensively on them.

The world's first fully synthetic plastic was Bakelite, invented in New York in 1907 by Leo Baekeland who gave the name plastic to the substance. Science Matters, (2020), the successful introduction and consequent dominance of plastics starting in the early 20th century is a pungent environmental concern regarding its slow decomposition rate after being discarded as trash due to its composition of very large molecules. It is any material consisting of any wide range of synthetic or semi-synthetic organic compounds that are malleable and so can be molded into solid objects after subjecting it to some treatment like fire, or chemical treatment. Aminu Kano (2018), posits that 50% of plastic waste generated comes from inadequate management due to the lack of infrastructure associated with an ever-increasing population.

Waste materials are found everywhere within our environment. They are an inevitable part of human life and they are generated every time as situations demand. In an attempt to survive, man creates orderliness in his environment. The concept of waste is the ability



Industrial revolution brought a lot of changes in humans' endeavors which modern emerged as a reaction against mechanization and standardization of human life imposed by technology.

However, recycling is the processing of waste materials into new products to prevent the disposal of potentially useful materials, reduce the consumption of fresh materials and the energy required for fresh produce and reduce the effects of disposed of wastes on the environment. The term recycling involves processing the used materials (discarded substances of wastes) into new products, to fresh materials, reducing energy source utility, and then reducing water and pollution. Recycling is the third component of the 'reduce, reuse and recycle waste hierarchy. The material usage in sculpture in terms of recycled waste materials exploration helps a lot in redressing the environmental waste accumulation dilemma. Nonetheless, assemblage in sculptural construction is the artistic expression that employs wastes, which has led to innovative and enormous use of improvisation, through the exploration of visual language. The artwork that is displayed in alfresco is used as a very potent tool to the public, hence visual language. Aminu Kano (2018) opine that about 30 million tonnes of plastic are produced annually all over the world, with 8 million finding their way into the oceans while the rest litter the streets, clog the drainages, and some flying in the air, causing health problems.

2.0 REVIEW OF EXISTING LITERATURE

For ages, the artist has explored his environment to create and re-create objects for aesthetic purposes. The artist's approach to waste management is better understood and workable in solid waste which can be seen. Such solid wastes include combustible wastes such as paper, wood, and cloth and non-combustible wastes such as metal, glass, plastic, and ceramic items. Other waste items are animal bones, vehicle parts, computer remnants, shoes, knives, sawdust, and other related items.

The dexterous artists thus reduce a very large quantity of discarded materials in the environment. The intellectual ingenuity of the contemporary artists toward creativity brought about the rediscovery of waste as a source of artistic expression. The discarded materials have the potential for aesthetic and functional purposes if they are well harnessed. According to Olarewaju Tejuosho (2008), the waste to art straddled creativity and enterprise. The dexterous artists thus reduce a very large quantity of discarded materials in our environment. The concept of reducing, re-use, re-arrange, repurpose and recycle. The artists recover, re-use, re-arrange and translate them into works of art, to reflect interesting concepts for utilitarian purposes as well as restore aesthetics to the rejected material substances. The concept of waste and recycling in art is the ability of the artists to use their initiatives to create, recreate, and reuse the rejected and discarded materials in the production of artworks. These materials are thus given new functional values through artistic expression.

In today's world of creativity and amazing art, some of the world's most compelling and creative works have been borne out of the simplest and most abundant of materials: waste. Art is consistently evolving. Out of waste, artists are now creating beautiful things. They are becoming daring with the choice of materials they work with and are continuously trying their hands on new mediums, recycling wastes and turning them into priceless artwork. "Wastes to wealth have become a general dictum in contemporary Nigeria because of numerous advantages in wastes recycling". Generally, artworks are highly valued and appreciated particularly the ones produced with unique media (materials) generated from wastes. Most of the solid wastes such as metals, plastics, and wood serve as art materials in all ramifications. Wastes (solid wastes) occupy space and when the wastes are managed through recycling or reused in an artistic process, space is created. This therefore will enhance orderliness for human comfort.

Olanrewaju (2016), describes recycling as the processing of waste materials into new products to prevent the disposal of potentially useful materials, reduce the consumption of fresh materials and the energy required for fresh produce and reduce the effects of disposed of wastes on the environment. That is, recycling is the recovery or reuse of usable materials from waste. The term recycling involves processing the used materials (discarded substances of wastes) into new products, to fresh materials, reducing energy source utility, and then reducing water and pollution. Recycling is the third component of the 'reduce, reuse and recycle waste hierarchy. The material usage in sculpture in terms of recycled waste materials exploration helps a lot in redressing the environmental waste accumulation dilemma. Nonetheless, assemblage in sculptural construction is the artistic expression that employs wastes, this has led to innovative and enormous use of improvisation, through the exploration of visual language. The artwork that is displayed in alfresco is used as a very potent tool to the public, hence visual language.

However, the works in discourse showcase assemblage which is a means of fitting found objects for an artist's expression in sculptural construction. It implies the process of bringing together found objects to make a sculpture. The artist has the knack of seeing beyond the ordinary and the ugly to seek, identify and select these materials. Eventually, the artist collects, utilizes, and finally creates something useful and aesthetically meaningful, thereby giving the waste a new lease of life.

According to Ifeoma Anyeaji (2014) sees, the impact of waste transformation into wealth can revitalize and move the expectations of the unemployed into the vocations capable of realizing stable economic livelihood. If we, therefore, make a visual and ideological tour around the various waste dumps around us we are no doubt studying several economic feasibilities through which waste can be channeled into financially beneficial uses; in other words, the utilitarian potentials of these environmental litters can be



reconstructed into wealth. Jacob Jari (2017) opines that mankind looked forward to a new order of ever-expanding production of goods and services with ever-decreasing human toil. The artist effectively selects and organizes this under the subject matter "waste to wealth for artistic expression." The creative endowment of the artists enables them to transform the discarded materials into something useful.

Otikpa (2014), asserts, that the ability to identify taste in our values, to a great extent determines the wealth we make out of the ideology of repurposing, we can easily establish a suitable platform from which we would be able to satisfy a benchmark for identifying the categories of waste with the potency of re-grafting to wealth.

The artist understudy, Oligbinde Samuel Rotimi, is an upcoming contemporary Nigerian artist who belongs to this classification of repurposing field; as he repurposes waste objects such as plastic bottles and bottle tops mostly as his medium of expression in communicating his ideas on the happenings around him to his audience.

3.0 THE ARTIST'S BIOGRAPHY

It is necessary to give the background information of the artist to facilitate a better understanding of his works. This will provide information on his sociological influences as well as professional developments. Most importantly it provides a good foundation for contextual analysis of the selected works.

Oligbinde Samuel Rotimi is originally from a small urban Northern town in Abeokuta, Ogun State. He displayed an artistic talent at an early age. He has been sculpting at an early age. He fell in love with sculpture when he was a kid. His sculptures are an excellent depiction of the mastery of the art. Oligbinde Samuel Rotimi was born on the 7th of October 1989, in Abeokuta, Ogun State Nigeria. He attended both primary and secondary school, Saint Bernadette and Taidob College at Abeokuta in Ogun state respectively. Owing to his academic dexterity, prowess, and unparalleled and ardent performance he was admitted into Obafemi Awolowo University, Ile Ife, into the prestigious Faculty of Environmental Design and Management where he bagged his bachelor's degree in Sculpture. Rotimi is one of the Contemporary Nigerian artists His area of focus involves plastic and metal sculptures and at times he combines more than one medium. His mastery of plastics can vividly be seen in his three-dimensional works where one can easily feel the celebration of colours carefully used on his figures. The experience he had when he was growing up fuelled the imagery and emotional quality of his works. His works usually start with an idea about a specific theme of contemporary issues in life and the environment and then he depicts them in common day-to-day activities. He is an artist known for his work with repurposed materials. He works with recycled materials and his art communicates a message about our fragile globe being overwhelmed by waste. He drew inspiration from the works of the legendary installation artist, El Anatsui. Rotimi Oligbinde is becoming recognized as a distinctive voice within the crop of young Nigerian artists whose works refer directly to issues of environmental degradation. His sculpture is labor intensive which engages the cutting of plastic bottles, washing the plastics, and piercing them to create a hole in which they could be bound together by copper wire.

4.0 ANALYSIS OF THE WORKS OF THE ARTIST



Plate 1: Uplifting Spirit

Artist: Oligbinde Rotimi, Installation,

Year of Production: 2018

1. *"Uplifting spirit"* is the composition of discarded bottle covers and discarded compact disks to create geometric forms based on design. The work is made up of bottle tops from discarded plastic and damaged disks mounted on a metal frame in squares graduating in sizes. The work is an abstract rich in meaning as it expresses meaning both in forms and the use of colours. It is a message to the present-day



society on the different spheres of human or individual development in the society itself. The work identifies the various characteristics of each individual as presented by each square; which examines how an individual struggles from cradle till he ascends to the position of authority and fame, and also how he assists others in reaching new heights.

The biggest square in the work is the representation of the masses who are characterized by penury, disguise, imitation, instability, and dents as suggested by the characteristics of the material used to decorate the boxes (discs), the disks with their shiny surface, and always changing attributes captures the characteristics of the masses as people with an unstable nature, disguise and always presents themselves higher than whom they are too unfamiliar personality. The masses are the majority, they look up to the few elites in the society, sometimes they dress and act as if they belong to that social caucus - the scratches and dents on the disc's surface which make it be discarded express the struggles of this majority in the society while the base material used expresses the discarded position which we occupy.

The second square which is smaller in size and made up of brighter colours emphasizes the transition of these individuals to a more stable life, but then dominated by blue meaning that they are still characterized by melancholy and gloom, as that of Pablo Picasso's blue period (Art in Focus). The green colour finding its way to this category means the growth and development being undergone by these people.

The colour red emphasized in the third section speaks of revolution as we can see the masses in the context of this work donated what has been dominating them for donkey years. The color yellow coming out brilliantly on the fourth phase of the design shows the people to have colonized (clarify) power and to have waxed strong as a result of "power" from the evolution. Even as the color yellow itself has to do with strength, energy, and Vitality

The last part of the design above, which is the part dominated by white with yellow in its center gives meaning to the perfect, purified state of this power. It connotes the excellence and perfection the people expect from this elitist minority. The concluding aspect of this design shows different bottle caps extending down from the top of the design, giving an ultimate instruction to the people out there in the position of authority and high places to remember its source by helping people from its source, as a proverb by the Yoruba people says that "a river that forgets its fountain often runs dry".



Plate 2: Hard Work

Artist: Oligbinde Rotimi,

Year of Production: 2018.

2. **Hard Work:** Generally, and is seen as a symbol of hard work, determination, and focus, these attributes attracted the artist to represent ant with the use of discarded plastic, the representation which can serve as public art is meant to sensitize and challenge the public by studying the attributes of the ant generally. It should be a reminder of the diligent attitude of the ant to labour even just in the construction of their habitation. There is a scholarly saying that wisdom is the application of knowledge, the Bible reverses the ant as hard-working, which shows that the little knowledge they have about the environment is being applied. That is why the Bible concludes that humans should learn wisdom from these ants (New Living Bible, Proverbs 6:6-8). The ant labours relentlessly, knowing that time is not on its side, they gather enough food for the winter during summer, so that in the winter they will lack nothing. They work overnight building ant hill, just to preserve a secret, of how they collectively construct their buildings. These ants have just a little of this specialized knowledge, but putting them into practice effectively.

In summary, the figure representation of the ant challenges all mankind to rise to action in putting into action all the knowledge we have acquired in the course of our existence. We should make our coming to school functional i.e. make our B.sc, Ph.D., and all



sorts to reflect in our use of the environment that is when we can be referred to as being wise. Since all our B.Sc, M.sc, and Ph.D., cannot be referred to as wisdom if not applied effectively.

Since society will still be based on the decisions of the few i.e. based on our right knowledge in the society (James Surowiecki, 2004, Why Many Are Smarter Than the Few). Let us as human beings influence our society positively, by making the right decision just like the Ants.



Plate 3: Mask

Artist: Oligbinde Rotimi, Mixed Media

Year of Production: 2017.

3. **The Mask:** In African view has a connection with the head apart from being worn on the head, the mask in the African setting informs the world about the content, attributes, and spiritual implications or purpose of the head. The various characteristics of the mask denote something about the head or the wearer itself. The stylish elements in a mask look are codified by the tradition and may either identify a specific community or convey a specific meaning. Looking at some traits in the masks, the eyes are half closed (the inequality of the two eyes) symbolizing a peaceful attitude, self-control, and patience. While the large space of the forehead symbolizes the wisdom of the wearer of the mask, Africans pay utmost attention to the size.

The work is an exploration of plastics on a metal frame of a mask. Rotimi tests how plastic can be used to adorn an uninteresting metal frame to give it an expression of life, through the use of various vibrant colours and forms of different plastics. The work is not just a depiction of materials but ideas about the prevailing issue in the environment. Rotimi having studied the environment and developed a deep understanding of the problems of society in connection to plastic waste as a non-biodegradable material, Presents the human head in the icon of a mask to point out the dereliction and weaknesses of the human race as caused by the inappropriate use of our "heads", i.e. our reasoning. The work expresses the artist's plight concerning humans using their head ironically by presenting us with a mask since it is a general belief that the head is the seat of wisdom and there lies the human mind, and human beings possess more intelligence than any other animal in the world. How come we can create trash and we cannot get rid of it?

The mask represented by Rotimi, which takes the form of a shield connotes the responsibility of humanity in defending the general habitat of all living organisms against plastic waste. It calls humans of all races into action on standing up to our responsibility by using our intellect properly. Human beings are gods in their environment, we are responsible for all that affects our habitat. This is a general call to all mankind to forfend, secure, shield, and stand up in defense of our habitat.

The inequality of the eyes of the mask denotes patience. The artist emphasizes patience in the mask because the new world, the new generation of mankind lacks patience in using their endowment which is the head creatively. The brain is there, but not patient enough to manage waste creatively. One of the major developments in the world, contributing immensely to the problem of waste management is the recent increase in fast food. As we all know that fast food is mostly packaged in plastics which contributes largely to the number of plastic waste that adds up to our habitat every hour. Rotimi being aware of this phenomenon emphasizes that human being needs to be patient, which influences this question; why fast food?



The vibrant colours used on the mask also connote the different expectations of mankind as members of the living habitat, and what we should work towards, for example, green represents growth, yellow represents vitality and strength, red represents power, etc.

In conclusion, the art piece is giving us the assignment to think productively, neglect the culture of wistfulness, and utilize our potential as the cliché that says "there is the sense in nonsense".



Plate 4: Alert

Artist: Oligbinde Rotimi,

Year of Production: 2018.

4: Alert: this is a representation of a deer, titled Alert; a word used to express sadness, sorrow, and disappointment. The art piece represents the gesture of a deer being aware of the impending danger of his environment, causing it to be tensed as a result of the inconvenience caused by the human factor in his environment. Rotimi expresses the plight of these animals whose immediate environment as it deteriorates the habitat of both humans and animals. The work is an environmental satire that points to the shortcomings of human beings concerning waste management in the environment. The art piece serves as an awareness to the society of how inappropriate waste management, particularly, plastic causes great harm to the environment and the inhabitants therein. Alas is also an irony to express the stance that; if an animal could be alerted to danger, then the human being should have taken a marathon in challenging themselves to action concerning waste management in society. This ill of waste management in society has been challenged by Rotimi in creating an aesthetic public art. As we should know that public art is not only a form of art executed in the public but also art created to affect the mindset and the perspective of the general public. Alert is executed in a publicly accessible epicenter place of the university; therefore, the message is both to the members of the university community and all who come across it directly and indirectly.

5.0 CONCLUSION

Art is dynamic and evolving. The modern world is even more challenging and great in awakening the consciousness of everyone. Trends change, and so does taste. The aesthetic dimension to the repurposing of waste has generally impacted the development of our environment. However, the "waste to wealth" movement has also had economic, political, social, educational, and physiological significance on society, viewing it from the utilitarian lens. It leads to a reduction in the desecration of water bodies, protection of aquatic and land livestock, forest preservation, and employment of the youth. Salvaging the plastics from drowning the earth, Igboanugo(2013), affirms through the recovery of waste materials such as inner tubes from vehicle tyres, industrial packaging, and textiles combined with his use of paint and African fabric, he repurposes and reinterprets what others discard. Beyond the intentional recycling element of this process, the visual concepts he explores surface a range of pertinent issues. Recycling art is another way of educating people about their environment. Many artists in our society, especially sculptors are used to recycling art and they experience the pleasure of investing, inventing, and creating. Recycling art provides cheap materials for artistic creations, it can also be considered a solution to the phenomenon of pollution, most especially in this period of alarming effects of climate change.

It also helps in reducing and addressing the environmental waste accumulation dilemma. It will be an alternative use of waste to protect the environment. Calling the attention of individual artists to also make use of plastics and bottle caps as an alternative medium of expression in sculpture and installation art in general. The works hereby will inspire up-and-coming artists in exploring the artistic potential of plastics in our environment.



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A COMPARATIVE STUDY BETWEEN SELF-PERCEPTION AND SOCIAL SKILL OF SECONDARY SCHOOL STUDENTS

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ABSTRACT

Present study has explored self-perception and social skill of secondary school Students. A representative sample of 100 students of Sonapat districts was randomly selected. Self-Perception scale by Dr.K.G.Agarwal and Dr. vishal Shood and Dr. Arti Shood' Social skills scale was used for measuring self-perception and social skills of secondary school students. Mean, 't' test and 'r' were used as statistical techniques to analysed the data. The result indicates that self-perception and social skills have significant difference on self-perception.

KEY WORDS: Self-Perception, Social Skill, secondary school students

INTRODUCTION

Self-perceptions, or different beliefs we have about ourselves, exert a powerful influence on the kinds of activities we engage in, the amount of effort we will expend on that activity, and the likelihood that we will engage in that activity in the future. Understanding how self-perceptions influence behavioral outcomes, and ultimately contribute to healthy adolescent development, has been a long-standing goal of researchers. Unfortunately, the literature on topics related to self-perception is rife with inconsistency and confusion over the definition and measurement of constructs. The purpose of this entry is to unpack and review different aspects of self-perceptions, and how they are related developmental outcomes. This understanding will allow us to develop interventions and educational programs to intervene when maladaptive patterns in understandings of self. Shaping of self-perception is among others influenced by physical, interpersonal, emotional, and cultural factors. In self-perception of overweight people an important role is played by interpersonal factors, which include the opinions of others and the relationship with the surrounding.

Social Skills

Social Skills can be defined as the set of skills people use to interact and communicate with one another. They are based on the social norms of our society and they tell us what attitudes and behaviours are considered to be normal, acceptable and expected in a particular social situation. Social Skills are important because they allow us to interact with each other with predictability, so that we can more readily understand each other and be understood. Without an agreed-upon social way of interacting, it is very hard to prevent misunderstandings. It is important for us to be able to interact with clarity. Social Skills include: how to greet someone, turn-taking in conversation, skills involved in maintaining conversation and engaging in eye contact, to name a few. Communication is key for improving Social Skills. Communication includes verbal and non-verbal components.

a. Verbal Communication

- Greetings
- Conversations • Participating in class
- Talking to your instructors
- Asking someone out on a date

**b. Non-Verbal Communication**

- Eye contact
- Handshake
- Body posture
- Tone of voice
- Hand gestures

In short, children develop better, more sophisticated social strategies, when they are able to maintain stable relationships with other children they like over long periods. Children's social competence with peers is an important aspect of their social development. 24 Good Social Skills are critical to successful functioning in life. The extent, to which children and adolescents possess good social skills, can influence their academic performance, behaviour, social and family relationships and involvement in extracurricular activities. Prior to determining the best means to help a student develop better social skills, it is important to understand specifically what a student can and can't do. It is crucial to assess and classify the nature, a child's social skill deficits, in order to devise and implement the most appropriate intervention.

Characteristics of Social Skills

- Social Skills are goal directed.
- Socially skilled behaviours are interrelated in the sense that one person may use more than one kind of behaviour at the same time for the same goal.
- Social Skills should be appropriate to the situation of communication.
- Different Social Skills will be used for professional and personal communication.
- Social Skills can be taught, practiced and learned.
- Social Skills can be identified, as certain types of behaviour where by an individual can be judged how socially skilled he/she is. Social Skills are complex.
- They involve overt, observable behaviours, as well as covert problem-solving skills.

REVIEW OF RELATED LITERATURE

Rudasill & Callahan (2010) conducted a study on the contribution of gender to the academic self-perception of ability and related coursework plans for high school and college across academically advanced students. Sample was 76 grades 5 to 12. Result showed that girls' self-perceptions of ability scores were higher than boys' in humanities and boys planned to take more math courses than girls. Also found that intelligent students' self-perceptions of ability correlated was significant with their future course work plans.

Daragad & Lakshmi (2013) conducted a study on social skills and behavior of school going students. Sample was selected 72 students of age group 6-12 years of government schools.. For statistical analysis, t-test and correlation were used. The result found that no significant difference was found between the social skills and behavior of the school going students. There is the need for enhancing the social skills and behavior of school going children for better peer acceptance and adjustment through an intervention program.

Chopra & Kalita (2014) conducted a study to develop an interaction programme to develop Social-Skills among students belonging to schedule caste category. Sample was selected 30 students of scheduled caste of primary school by using random sampling technique and divided in two categories i.e. control and experiment group. Experiment group was given treatment for social skills while control group not give any type of treatment. It was found that interaction programme has positive effect on social-skill development of scheduled caste students. The result found that social skills can be developed through the programmes which help in socialisation process.

JUSTIFICATION OF THIS STUDY

Although social skills, self-perception are related concepts, they differ in some aspects. It is vital for children to use social skills because they are the route to create and develop relationships. These are needed for enriching social experiences, and lessen the chance for negative interactions. Being the building blocks for friendships, social skills give children the chance to learn from their peers and learn how to be considerate with those they meet in the future. Social skills also give children a sense of confidence and mastery over their environment. Social skills instruction is as important for many students with disabilities as instruction in core academic subjects. Literacy-based behavioral Interventions (LBIs) are an effective intervention that instructors may use to increase positive social skills among students (Francis, et. al. 2013).

After going through the review of related literature, it has been found by the researcher that there is a scarcity of experimental researches in the field of social skills and self- perception in India. Therefore, the investigator felt that there was a need to conduct a study on the explore the relationship between ocial skills and self-perception. and of secondary school students. The present study is expected to contribute to the field of theory and practice of self-perception and social skills.



STATEMENT OF THE STUDY

“Self-Perception and Social Skill of Secondary School Students : A Comparative Study”

Self-Perception: A person's view of his or her self or of any of the mental or physical attributes that constitute the self.

Social Skill: Social Skills: Social skills are described as a set of competencies that facilitate the initiation and maintenance of social relationships, contribute to peer acceptance, result in satisfactory school adjustment, and allow students to cope with and adapt to the demands of the social environment.

Gender: In the current study, Gender to male & female students of secondary schools.

Secondary School Students Those students who are studying in 9th and 10th classes affiliate with Board of School Education Haryana.

OBJECTIVES OF THE STUDY

The Present investigation asserts to meet the few objectives. They are mentioned below:

- 1) To find the difference between self-perception of boys and girls of secondary school students.
- 2) To find the difference between social skill of boys and girls of secondary school students.
- 3) To find the difference between self-perception and social skill of secondary school students.

Hypotheses:

- Ho1. There will be no significance difference between boys and girls of secondary school students on the basis of self-perception.
Ho2. There will be no significance difference between boys and girls of secondary school students on the basis of social skill.
Ho3. There will be no significance difference between self-perception and social skill of secondary school students.

SAMPLE OF THE STUDY

The sample included 100 secondary school students from them 50 male students and 50 female students.

VARIABLES USED IN STUDY

The present study has focused on two variables

Independent Variable: In this study self-perception is taken as independent variable.

Dependent Variable: In this study social-skill is taken as dependent variable.

RESEARCH METHODOLOGY

In this study descriptive method was used for data collection.

STATISTICAL TECHNIQUES USED

Mean, SD and 't' test were used as statistical techniques to analysed the data.

RESULT AND DISCUSSION

Table -1
Comparison between boys and girls on self-perception.

Self-perception	No	Mean	SD	t value	Significance level at 0.05
Girls	50	266.68	45.25	0.011	Not significant
Boys	50	298.25	46.2		



Comparison of self-perception between boys and girls

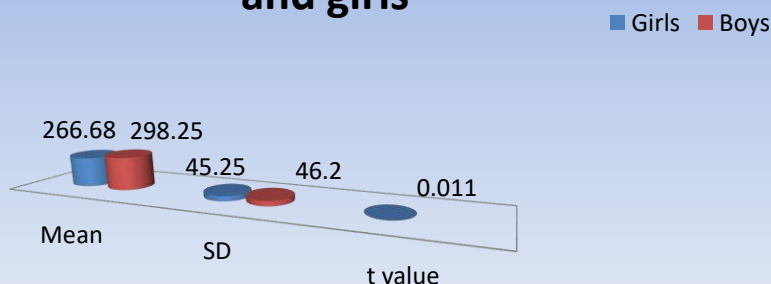


Table & Fig.1. Indicated that the mean score of girls and boys of Self-perception 266.68 and 298.2 respectively. The SD of girls and boys of secondary school students was found 45.25 & 46.2 respectively. The calculated t value was found 0.011 which is not significant at 0.05 and 0.01 level of significance. So Null hypothesis “There will be no significance difference between boys and girls of secondary school students on the basis of self-perception” is accepted.

Comparison on social skill between boys and girls

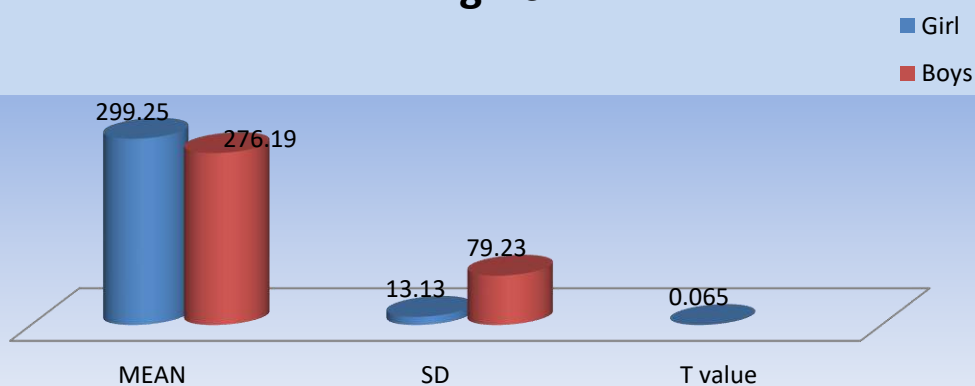


Table -2
Comparison between boys and girls on social skill

Self-perception	No	Mean	SD	t value	Significance level at 0.05
Girls	50	299.25	3.13	0.065	Not significant
Boys	50	276.19	79.23		

Table & Fig.2. Indicated that the mean score of girls and boys of Social Skills 299.25 and 276.19 respectively. The SD of girls and boys of secondary school students was found 13.13 & 79.23 respectively. The calculated t value was found 0.065 which is not significant at 0.05 and 0.01 level of significance. So Null hypothesis “There will be no significance difference between boys and girls of secondary school students on the basis of Social skills” is accepted.

**Table-3**

Variables	No.	Mean	SD	't' value	Significant level
Self-perception	100	282.82	275.15	0.475	Not significant
Social Skills	100	46.20	54.14		

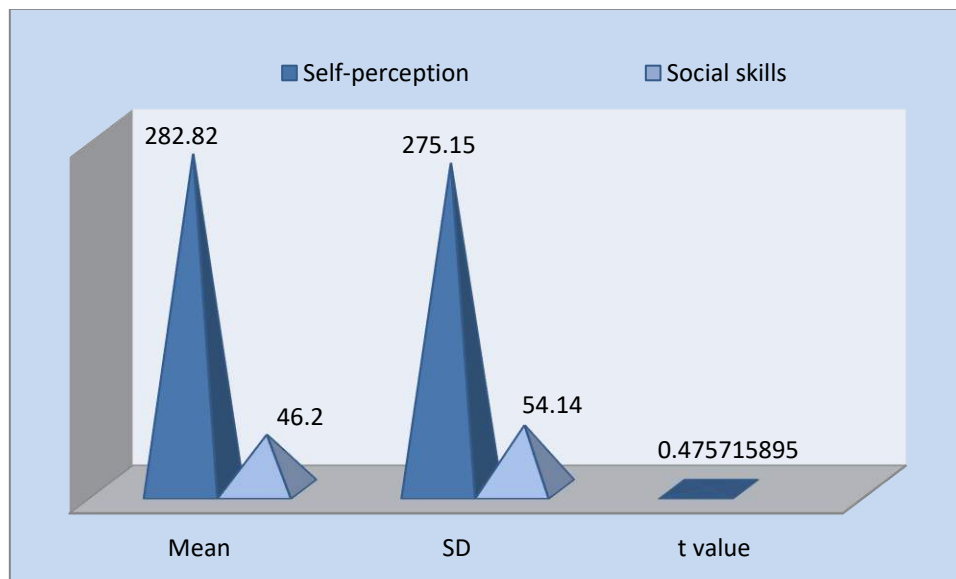


Table & Fig.3. Indicated that the mean score of girls and boys of Social Skills 282.82 and 75.15 respectively. The SD of girls and boys of secondary school students was found 46.2 & 54.14 respectively. The calculated t value was found 0.475 which is not significant at 0.05 and 0.01 level of significance. So Null hypothesis "There will be no significance difference between self-perception and social skills of secondary school students" is accepted.

DELIMITATIONS

- This study is confined to 100 secondary school students only.
- The study is delimited to secondary school students on the basis of gender only.
- The present study is considered only two variables i.e Self-Perception and Social Skill.

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STREPTOMYCIN AND PYRIDOMYCIN DRUG MOLECULES PROVIDE THE MOST POTENTIAL INHIBITORS AGAINST RV3871 TO CURE TUBERCULOSIS

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ABSTRACT

The ESX-1 secretion system of Mycobacterium tuberculosis delivers bacterial virulence factors to host cells during infection. The most abundant factor, the ESAT-6/CFP-10 dimer, is targeted for secretion via a C-terminal signal sequence on CFP-10 that is recognized by the cytosolic ATPase, Rv3871. ATPase that is a component of the ESAT-6/CFP-10 secretion system. ESX locus contains genes encoding conserved secretion machinery components termed EccCb1. these core components are required for ESAT-6/CFP-10 secretion [70, 71]. Rv3871 is a cytoplasmic protein connected with the Rv3870 and encoded by the EccCb1 gene. These proteins supply energy for the secretion process. Each of these ATPases is involved in targeting protein for ESX-1 secretion. EccCb1 binds a seven amino acid C-terminal signal peptide of CFT- 10, which is required for secretion of the ESAT-6/CFP-10 complex. In this we target the Rv3871 seven amino acid c-terminal region and block it through multiple drugs so, it cannot be activated by the ATPases and not to supply energy for the secretion protein during infection (Tuberculosis). In the present study we have comparatively studied different Rv3871 inhibitory antagonist drug molecule which could be a potential drug molecule to inhibit ATPases on the Rv3871 molecule that is responsible for the energy supply. We have 16 antagonistic drug molecules as shortlisted based on previous studies, that block the target site on the Rv3871 molecule.

KEYWORDS: Tuberculosis/Drug target/Molecular Docking/Screening of antituberculosis drug.

INTRODUCTION

Mycobacterium tuberculosis (M. tuberculosis) is a Gram-positive bacterium that causes Tuberculosis (TB). TB is one of the oldest known diseases and is still is one of the major causes of mortality. Two million people die each year from TB worldwide. TB is primarily a pulmonary disease caused by the deposition of M. tuberculosis contained in aerosol droplets on the lung alveolar surfaces (Rachman, H., Strong, M., Ulrichs, T., Grode, L., Schuchhardt, J., Mollen Kopf, H., Kosmiadi, G.A., Eisenberg, D. and Kaufmann, S.H., 2006). M. tuberculosis host cell infections critically depends on the release of virulence factors through the specialized secretion system ESX-1 which belongs to the type VII secretion systems (Abdallah, A.M., Van Pittius, N.C.G., Champion, P.A.D., Cox, J., Lui rink, J., Vandenbroucke-Grauls, C.M., Appel Melk, B.J. and Bitter, W., 2007). ESX-1 includes different cytoplasmic and membrane bound proteins which together leads to the transportation of virulence factors from the pathogen to the host cell. The ESX-1 secretion system includes Rv3868, Rv3870, Rv3871 and Rv3877 transporter as its major components; EspC, ESAT6 and CFP10 are the virulence small proteins secreted by ESX-1 system (Carlsson, F., Joshi, S.A., Rangell, L. and Brown, E.J., 2009). The objective of current proposal is to determine the Screening of drug molecules against Rv3871 transporter of Mycobacterium tuberculosis ESX-1 system using Auto dock, Auto dock vina for Molecular Docking and PyMol for comparing results which obtained from run by Command prompt. The Rv3871 enzyme binds to ESAT6/CFP10 and is involved in translocation of virulence factors across the bacterial cell wall (Fortune, S.M., Jaeger, A., Sar racino, D.A., Chase, M.R., Sassetti, C.M., Sherman, D.R., Bloom, B.R. and Rubin, E.J., 2005). The Rv3870+Rv3871 complex binds to ESAT6/CFP10 virulence factor and translocate across the bacterial cell wall. The Rv3877 transporter is located on the cytoplasmic membrane and facilitates the translocation of ESX-1 virulence proteins across the membrane. Screening



of drug molecules against the Rv3871 will help to block the Target sites, and understand the virulence factor secretion by ESX-1 system. Structural basis of ESAT6/CFP10 recognition by Rv3871 enzyme will provide the platform for designing specific inhibitors (Xu, J., Laine, O., Masciocchi, M., Manoranjan, J., Smith, J., Du, S.J., Edwards, N., Zhu, X., Fenselau, C. and Gao, L.Y., 2007), which may block the Rv3871 secretion by ESX-1 system. The Screening of drug molecules against Rv3871 structure might reveal the Target site around Rv3871 and block the ATP site which provide the supply of energy to activate the Rv3871 molecule that cause the virulency during infection (Chen, J.M., Pojer, F., Blasco, B. and Cole, S.T., 2010). The Rv3871 transporter from ESX-1 system is involved in translocation of the virulence proteins across the cytoplasmic membrane. It is a cytoplasmic membrane protein that comprises 591 residues. The Screening of drug molecules against Rv3871 will explain it ATPases binding sites on the Rv3871 to activated it that for energy supply of translocation of virulence proteins across the membrane. A detailed understanding of the virulence protein secretion mechanism by ESX-1 system will be critical for *M. tuberculosis* drug development (Chen, J.M., Pojer, F., Blasco, B. and Cole, S.T., 2010). The Rv3871 transporter proteins constitute a pathway for virulence protein secretion by *M. tuberculosis*, which can be targeted selectively for drug development (Bao YG, Qi ZF, Bao L. Nan Fang Yi, Ke Da Xue, Xue Bao 2009).

MATERIAL AND METHOD

Identification of drug target

The ESX-1 secretion system of *M. tuberculosis* delivers bacterial virulence factors into host cell during infection. The most abundant factors ESAT-6/CFP-10 dimer is targeted by ESX-1 system for secretion via C-terminal signal sequence of CFP-10, which recognize cytosolic AAA ATPase Rv3871 (Di Giuseppe Champion, P.A., Champion, M.M., Manzanillo, P. and Cox, J.S., 2009). The EccCb1 (ESX-1 substrate protein Apprases, *Rv3871*) encoded outside the EccCb1 region is a target of cellular immunity (Millington, K.A., et al. 2011). In the patients with active and latent TB infection, the cellular immune response of EccCb1 is highly immunodominant as ESAT-6 and CFP-10 (Sidders, Ben, et al. 2008; Millington, K.A., et al. 2011). Biochemical analysis has indicated that ESX-1 secreted substrates and AAA ATPase together form multi-protein complexes inside the cell (Di Giuseppe Champion, P.A., Champion, M.M., Manzanillo, P. and Cox, J.S., 2009). Both Rv3870/Rv3871 genes of ESX-1 system are essential for secretion of virulence factor ESAT6/CFP10 (Fortune, S.M., Jaeger, A., Sar racino, D.A., Chase, M.R., Sassetti, C.M., Sherman, D.R., Bloom, B.R. and Rubin, E.J., 2005). The ATPase binding site on Rv3871+ EccCb1 transporter will reveal the overall blocking site of virulence factor secretion pathway adopted by *M. tuberculosis* ESX-1 system (Chen, J.M., Pojer, F., Blasco, B. and Cole, S.T., 2010). Screening analysis of these proteins will aid in designing novel inhibitors/drugs, which may block the ESX-1 secretion pathway in *M. tuberculosis*. (Feltcher, M.E., Sullivan, J.T. and Braunstein, M., 2010).

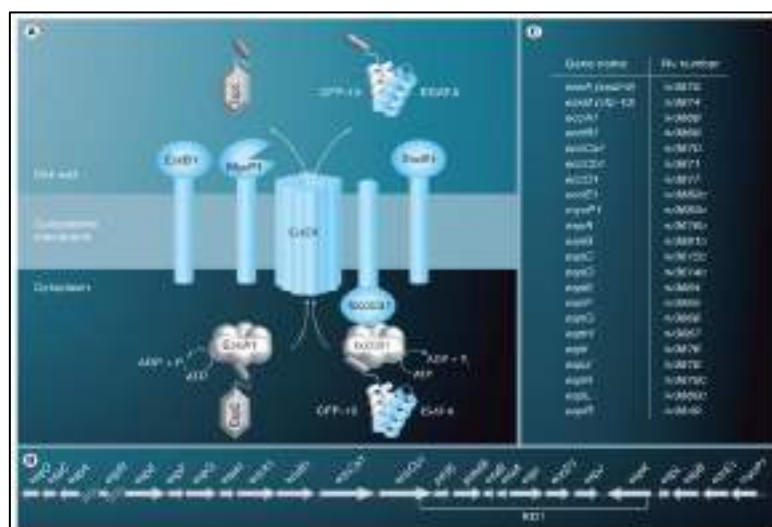


Fig:1 diagram of cytoplasmic membrane proteins and integral membrane proteins. The figure is adopted from Feltcher et al., 2010.

**Find Ligand for drug repurposing**

S. No	Candidate Drug molecules & Rv3871	Compound ID (CID) PubChem
Substrate	Rv3871	
1	Pyridomycin	Conformer3D_CID_3037036
2	Streptomycin	Conformer3D_CID_19649
3	Bed aquiline	Conformer3D_CID_5388906
4	linezolid	Conformer3D_CID_441401
5	Delamanid	Conformer3D_CID_6480466
6	pA824	Conformer3D_CID_456199
7	Amikacin	Conformer3D_CID_37768
8	Levofloxacin	Conformer3D_CID_149096
9	Fluroquinolone	Conformer3D_CID_1526055
10	Terizidone	Conformer3D_CID_65720
11	Isoniazid	Conformer3D_CID_3767
12	Pyrazinoic acid	Conformer3D_CID_1047
13	Ofloxacin	Conformer3D_CID_4583
14	Kanamycin	Conformer3D_CID_6032
15	Clofazimin	Conformer3D_CID_2794
16	Ethambutol	Conformer3D_CID_14052

Table:1(Drug table)

Molecular Docking analysis: In this we used the MGL docking tool for the docking analysis. In this the grid box had formed that helped in the cover the target site. Retrieval of proteins sequence of Rv3871 Uniprot/PDB. Protein sequence information from database will be used for Clustal Omega EBI search for evolutionary Phylogeny analysis. Secondary structure will be determined using I-TASSER and structure inspection by using Pymol. Preparation of library of potential repurposing inhibitors for Tuberculosis (Rv3871). Preparation of 3D structure library of potential repurposing inhibitors for Tuberculosis (Rv3871) from PubChem. Molecular interaction analysis of individual drug inhibitor candidate against Rv3871 by Auto dock Vina, Auto Dock Tool (ADT) and PyMol.

Screening of Antagonistic drug against Tuberculosis: In the present study we have comparatively studied different Rv3871 inhibitory antagonist drug molecule which could be a potential drug molecule to inhibit ATPases on the Rv3871 molecule that is responsible for the energy supply. We have 16 antagonistic drug molecules as shortlisted based on previous studies, that block the target site on the Rv3871 molecule.

We selected the anti-tuberculosis drug that is Pyridomycin, streptomycin, Linezolid Bedaquiline, Delamanid, because these drugs block the ATPase site on the Rv3871 and stop the energy supply during infection that is why the proteins CFP-10/ESAT-6 do not pass the membrane. The Rv3871 that is cytoplasmic membrane protein that connect with the Rv3870 and EccCb1 together form a complex and it get activated by the binding of ATPase.



RESULT

Streptomycin and Pyridomycin are the most potential drug against Tuberculosis:

The binding energies of these two drugs are comparatively lowest -6.5 and -7.4 kcal/mol respectively. These drugs cover the almost amino acids that is present on the Rv3871 loop and block their active sites loop (377AAKSGKTT384) and (574APY576) of the Rv3871 molecules.

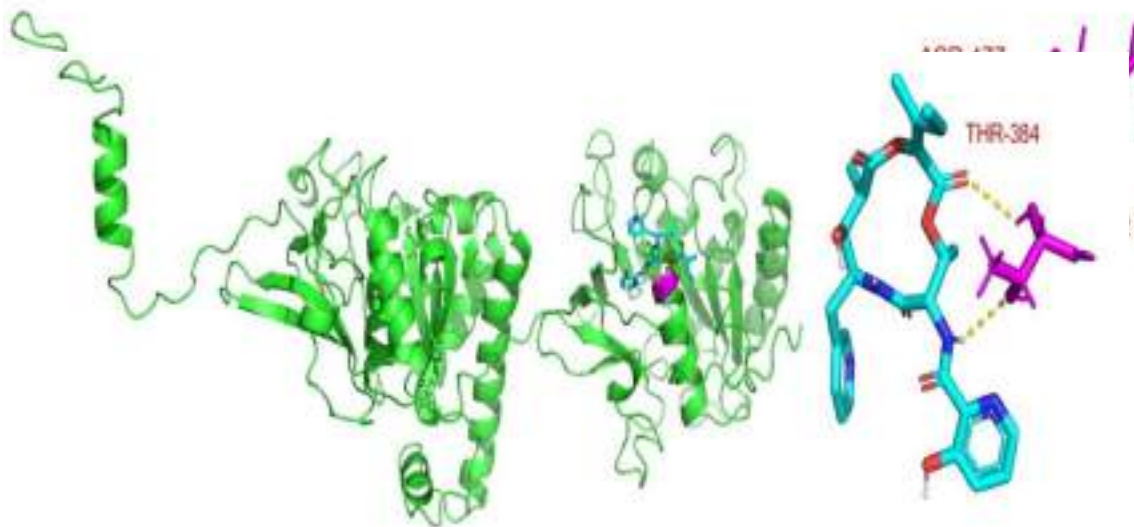


Fig:2 In this result the Streptomycin block the target site (that is bind with amino acid is ASP-477, THR-382, THR-383, GLY-381) these all the amino acid present on the target site.

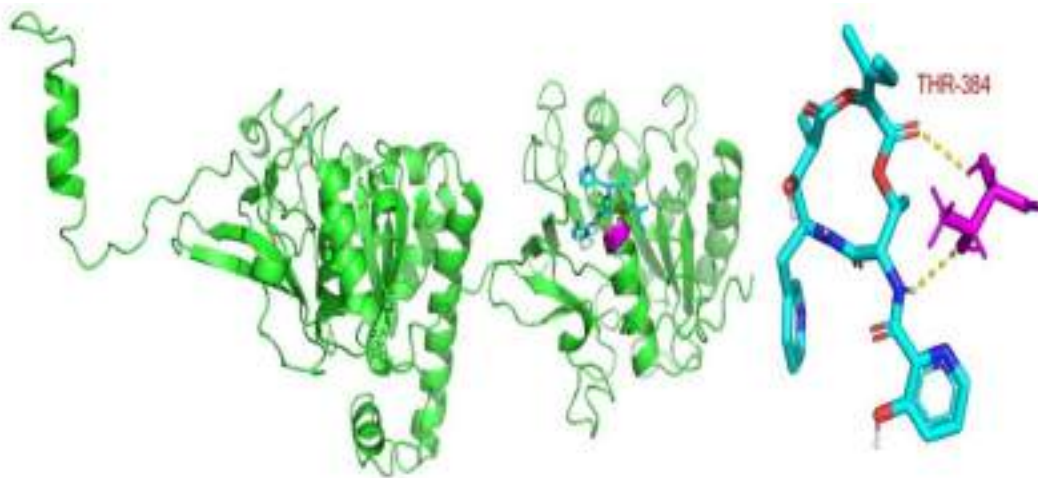


Fig: 3 In this result the Pyridomycin block the target site (that is bind with amino acid is THR-384) these all the amino acid present on the target site.

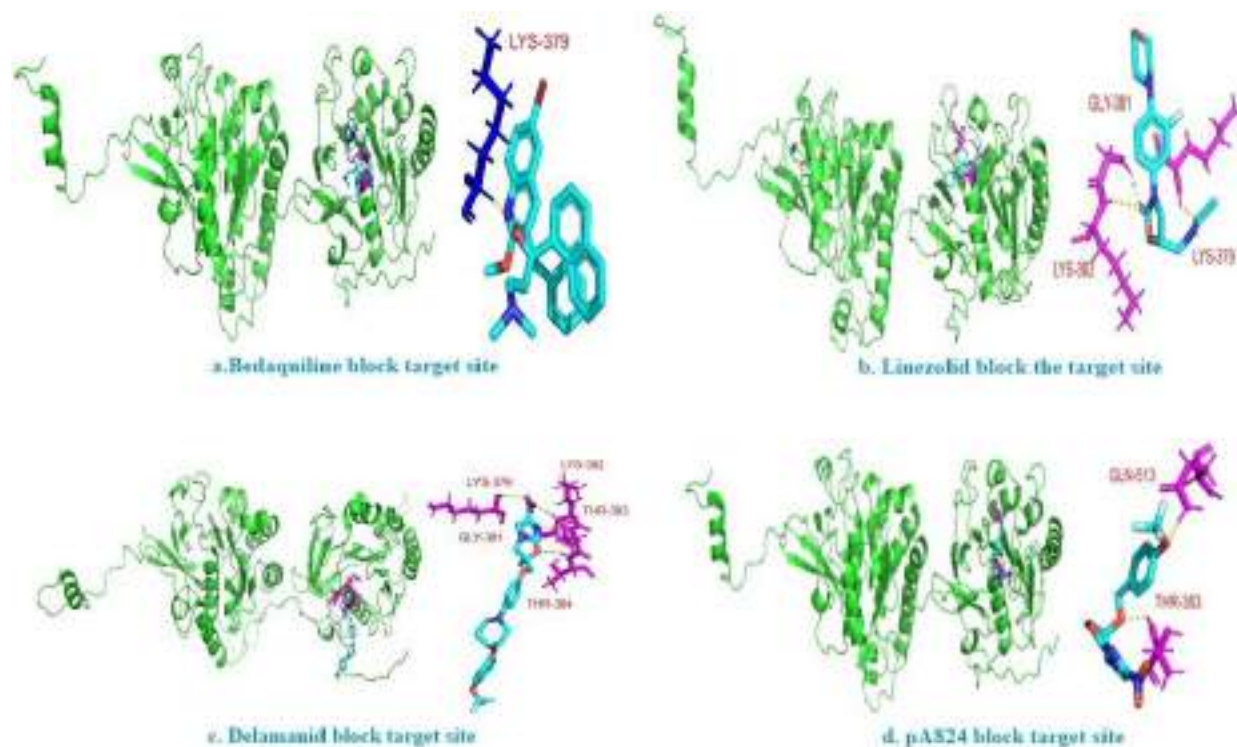


Fig: 4 In the dig, a. Bedaquiline bind with the target amino acid LYS-379. b. Linezolid bind with the target amino acid GLY-381, LYS-379, LYS-382. c. Delamanid bind with the LYS-382, LYS-379, THR-383, THR-384, GLY-381 target amino acid. d. pAS24 bind with target amino acid the THR-383, and a non-target amino acid GLN-513.

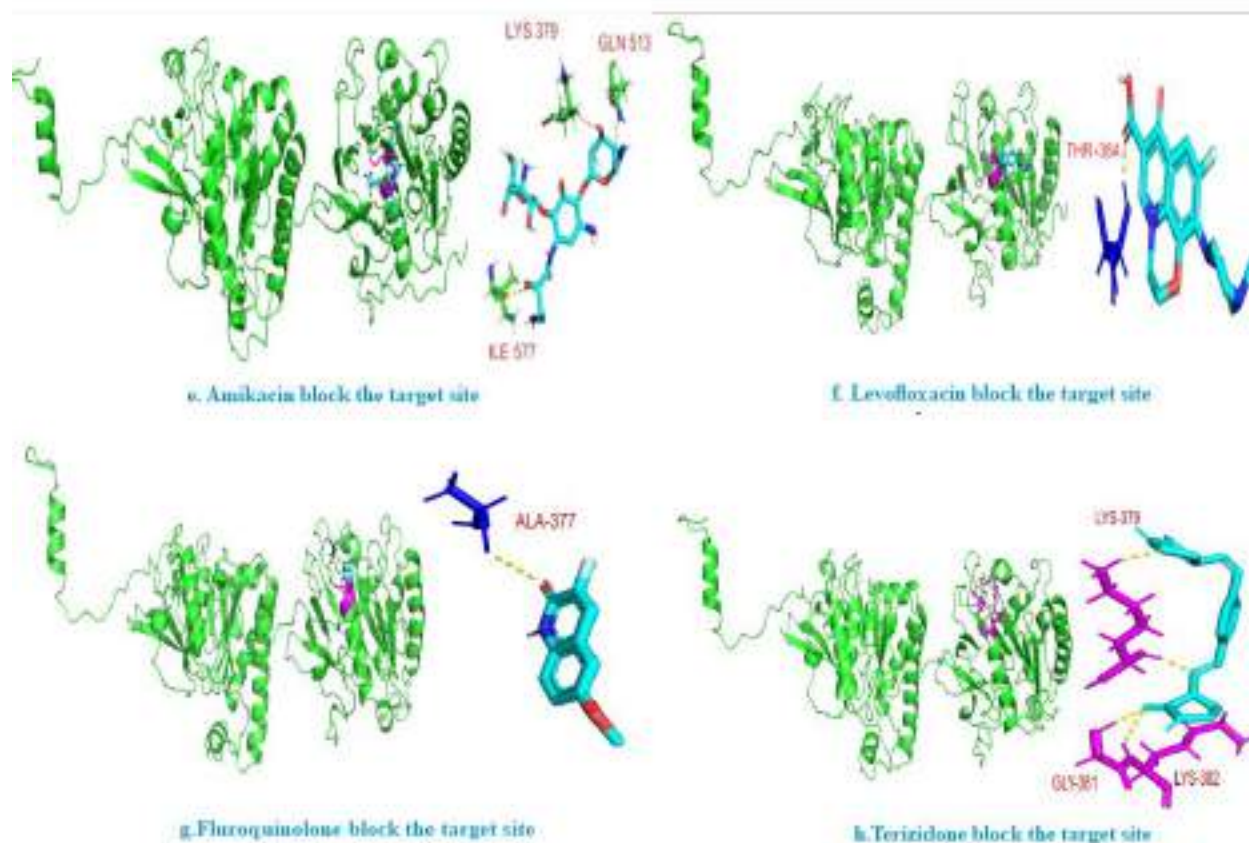


Fig: 5In the dig, e. Amikacin binds with amino acid LYS-379, and two non-target is ILE-577, GLN-513. f. Levofloxacin bind with the THR-384 target amino acid. In the g. Fluroquinolones bind with the target amino acid ALA-377. h. Terizidone bind with the target amino acid LYS-379, GLY-381, LYS-382.

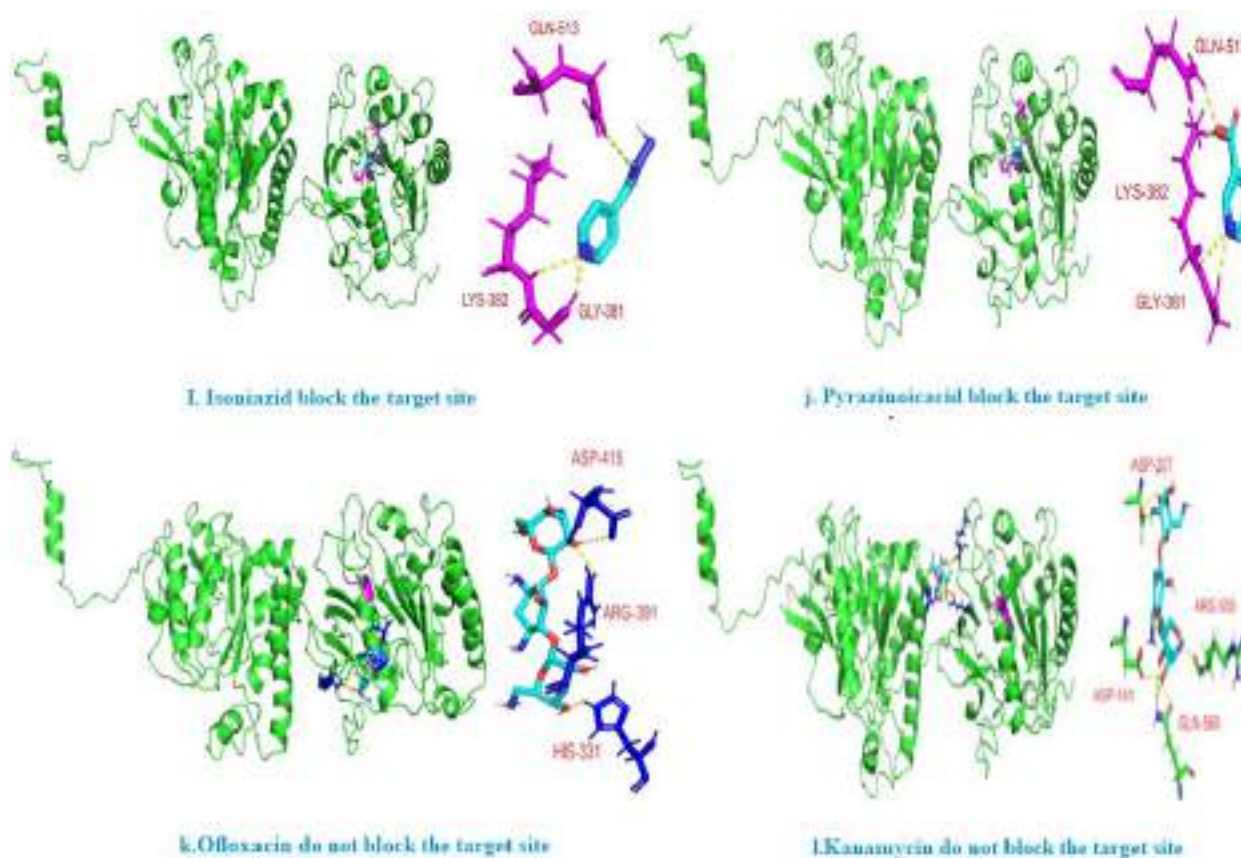


Fig: 6 In. Isoniazid bind with the target amino acid GLY-381, LYS-382 and a non target site GLN-513. J. Pyrazinoic acid bind with the target amino acid GLY-381, LYS-382, and a non target amino acid is GLN-513. K. Ofloxacin bind with the all non target amino acid are ASP-415 , ARG-391, HIS-331. L. Kanamycin bind with all the non target site it don not block the target site like ASP-141, GLN-513, ASP-277, ARG-555.



S.No.	Drug Molecules	Binding Energy	Blocking amino acids of active site	Amino acids binding to ATP
Substrate	ATP			ALA 377, ALA 378, SER 380, LYS 379, GLY 381, LYS 382, THR 384, THR 383, ILE 385, ALA 574, PRO 575, TYR 576 ALA 377, ALA 378, SER 380, LYS 379, GLY 381, LYS 382, THR 384, THR383, ILE 385, ALA 574, PRO 575, TYR 576
1	Pyridomycin	-7.4	THR-384	
2	Streptomycin	-6.5	ASP-477, THR-382, THR-383, THR-384, GLY-381	
3	Bedaquiline	-6.3	LYS-379	
4	linezolid	-6.2	GLY-381, LYS-379, LYS-382	
5	Delamanid	-6.1	LYS-379, LYS-382, GLY-381 THR-383, THR-384	
6	pA824	-5.9	GLN-513, THR-383	
7	Amikacin	-5.8	LYS-379, GLN-513, ILE-577	
8	Levofloxacin	-5.8	THR-384	
9	Fluroquinolone	-5.0	ALA-377	
10	Terizidone	-4.8	LYS-379, GLY-381, LYS-382	
11	Isoniazid	-4.7	GLN-513, LYS-382, GLY-381	
12	Pyrazinoicacid	-4.3	GLN-513, LYS-382, GLY-381	
13	Ofloxacin	-6.4	ASP-415, ARG-391, HIS-331	
14	Kanamycin	-5.8	ASP-207, ARG-555, ASP141, GLN-560	
15	Clofazimin	-7.3	GLY-381	
16	Ethambutol	-3.0	ARG-391, ASP-415, ASP-491	

Table:2 (Drug table blocking amino acid of active site with binding energy)



CONCLUSION

In the present study we have comparatively studied different Rv3871 inhibitory antagonist drug molecule which could be a potential drug molecule to inhibit ATPase on the Rv3871 molecule that is responsible for the energy supply. The Pyridomycin and Streptomycin molecules were observed to specifically bind to the key active site loop (377AAKSGKTT384) and (574APY576) of the Rv3871 molecules. The Binding energy of the Pyridomycin and Streptomycin was also comparatively lowest -7.4 and -6.5 kcal/mol respectively. Out of these two the Streptomycin drug is best inhibitory drug against Tuberculosis, because it blocks almost amino acid (ALA 377, ALA 378, SER 380, LYS 379, GLY 381, LYS 382, THR 384, THR383, ILE 385, ALA 574, PRO 575, TYR 576) on the target site. Hence, overall, from the present study we may conclude that the Streptomycin drug candidate would be a highly potential drug to inhibit ATPase on the Rv3871 and hence the drug could be a potential antituberculosis drug to inhibit the energy supply to the Rv3871 during infection. Although in vivo and human trials would be an essential obligation to the said conclusions, which may be addressed in future prospects of the present study.

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DEVELOPMENT OF THE SUNN PEST ON WINTER WHEAT CROPS IN EXTREME CONDITIONS OF THE REPUBLIC OF KARAKALPAKSTAN

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ANNOTATION

The article presents the results of a study of the spreading and development of sunn pest on wheat crops. The dynamics of development and harmfulness from the beginning of April to the end of the growing season in the extreme conditions of Karakalpakstan were determined. Recommendations are given on the use of optimal types of chemicals to prevent the development of the pest.

KEYWORDS. Pests, dynamics, harmfulness, biotope, biocenosis, biological efficiency.

INTRODUCTION

At present, the occupied area of the territory of the Republic of Karakalpakstan is 167,091 km², which covers about 37% of the entire territory of the Republic of Uzbekistan, being located in the extraordinary zone of risky farming. In the north-east it borders with the regions of Kazakhstan, in the east and south with Turkmenistan, in the south-west with the Khorezm region. The region, in certain criteria, differs from its neighbors in terms of natural, climatic, soil and plant resources. The main territory is the primary ecosystem, where cotton, rice, wheat, vegetables, melons and fodder crops are cultivated in the agrobiocenosis of the country, occupying certain areas. The climate is sharply continental, the cold period (below -10°C) lasts from October to March, the increase in air temperature in summer reaches + 40-45°C, in winter it drops to minus 25-30°C, which actively affects the cultivation of winter wheat varieties [1].

In this agro-climatic condition, winter wheat has been cultivated for the last 20 years and currently covers more than 53,000 hectares. In the main part of the occupied area, varieties transported from Russia Krasnodar-99, Tanya, Grom, Gratsiya and varieties Yaksart, Omad, Asr, Orol bred by local breeders are cultivated. The above varieties of Russian wheat are intensive, which, with the use of optimal agrotechnical work, give the maximum yield.

A change in plant resources growing in agrobiocenosis is observed with the appearance of new insect species that were not previously recorded in this region. Among such factors in the biotope of this region, particularly dangerous types of wheat pests include: wheat thrips (*Haplothrips tritici* Kurd), wheat aphids (*Schizaphis graminum* Rond), sunn pest (*Eurygaster integriceps* Put), barley leaf beetle (*Lema melonopus* L.) and others. [2-4].



METHODS OF THE RESEARCH

In determining the types of pests and entomophagous species in the biotope of wheat grown in Karakalpakstan, the methods of BP Adashkevich, Sh.T.Khojaev were used and V.I.Tansky's methods was used to define the damage. The results of the study were analyzed by variance, and mathematical statistical processing was carried out on the basis of the method of B.A. Dospekhov [3-5-6-7].

RESULTS OF THE RESEARCH

According to the spreading area and the damage, the sunn pest turned out to be the dominant species. This type of pest first appeared in the region after 2010 and is now widespread in all areas of wheat and causes serious damage to crops. To develop optimal measures against the pest, studies were carried out to study the bioecological features of development, population dynamics, harmfulness and protective measures.

It has been established that the sunn pest winters in the imago phase on plant remains under stones around the fields. At an elevated air temperature of $+5^{\circ}\text{C}$, it leaves the wintering place and continues its spread on wheat crops in the third decade of April. First, the female additionally feeds and lays eggs, the intensity of reproduction of adults, eggs and larvae in this agro-climatic condition falls on the May.

The results of a study on the development of the bioecology of the pest indicate that the female pest developing under optimal conditions lays an average of 60.2 eggs, 46.1 larvae come out of them, of which 34.5 reproduce until the imago phase. During May and until the second decade of June, reproduction per 1 m² of wheat field is 1.0-2.1 adults, 10.5-12.2 eggs, 6.9-9.5 larvae. Leave for wintering in the third decade of June.

When breeding a sunn pest per 10 m² of field, on average, up to 10 specimens 46.2 pieces are destroyed from each 1m² of the field, 0.14 pcs. grain and from a mass of 1000 grams of wheat grain is reduced by 11.1 grams, which leads to a yield loss of 10.9 quintals per hectare, with a deterioration in the quality of the crops.

To prevent this loss, the methods and terms of treatment with chemicals recommended for use on wheat crops against pests have been studied. The treatment was carried out using a tractor sprayer with a working fluid flow rate of 200-300 l/ha (Table 1).

As a result of the work carried out, it was found that the use of chemicals in controlling sunn pests on wheat crops with a density of 12.9-24.1 per 100 plants ensures the destruction of 73.1-93.1% of the pest in the third day after treatment. The biological effectiveness of the drugs during 14 accounting days was 96.4-98.9%, which is more effective drugs were Bagheera 20% s.e.k. in consumption 0.1 l/ha, 10% em.c. Killer extra - 0.1 l/ha, 5% em.c. Esfen-alpha - 0.3 l/ha, 55% em.c. Cyperphos-0.5 l/ha, 55% em.c., which are currently widely used on wheat crops in controlling this type of pest.

**Table 1.****Biological effectiveness of the use of chemicals against harmful bugs on wheat crops***Chimbay district of the Republic of Karakalpakstan, 2020-2021.*

Variants	Spendin g norms, л/га	Amount of pests until application, pieces for 100 plants	Biological effectiveness in days, %					
			3		7		14	
			\bar{S}	$\pm m$	\bar{S}	$\pm m$	\bar{S}	$\pm m$
Bagira, 20 % s.e.k.	0,07	24.1	89,1	1,6	93,6	2,4	95,2	2,1
Bagira, 20 % s.e.k.	0,1	18.5	94,1	1,8	97,1	1,9	98,9	0,8
Atilla, 5 % em.k.	0,15	21.5	86,3	3,1	92,1	1,6	94,4	2,1
Atilla super, 10 % em.k.	0,1	17.4	83,1	2,4	93,2	3,0	94,8	2,5
Killer neo, 10 % em.k.	0,07	20.5	86,1	2,7	88,4	2,9	91,3	2,6
Killer extra, 10 % em.k.	0,1	17.2	87,4	3,2	90,6	2,8	93,2	1,8
Dalate, 5 % em.k.	0,2	14.6	82,4	2,6	83,2	3,1	86,1	1,6
Esfen alfa, 5 % em.k.	0,3	12.9	93,1	2,9	95,2	2,9	96,4	2,2
Ciperphos, 55 % em.k.	0,5	17.5	92,5	2,4	96,1	2,5	98,2	1,0
Entometrin, 25 % em.k.	0,2	16.4	73,1	2,9	79,6	2,2	84,3	2,3
Agrophos-D, 55 % em.k.	0,5	15.8	84,8	3,5	91,6	2,8	92,5	2,1
Control (without application)	-	24.0	Amount of pests.					
			26,5	2,4	31,6	3,5	38,1	1,1

CONCLUSION

Thus, in the agro-climatic conditions of the Republic of Karakalpakstan, cultivated intensive varieties bred in the conditions of the Russian Federation turned out to be favorable for the mass development of many types of specific pests such as wheat thrips (*Haplothrips tritici* Kurd), wheat aphids (*Schizaphis graminum* Rond), sunn pest (*Eurygaster integriceps* Put), barley leaf beetle (*Lema melonopus* L.). According to the spreading area and harmfulness, the sunn pest is dominant, which lives up to 10 specimens per 10 m² of field, reducing 7.9 quintals of yield per hectare, with a deterioration in the quality of the crops obtained. To prevent the loss of these crops, the use of chemical treatment with the above-mentioned preparations is recommended.

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DEVELOPMENT DYNAMICS OF PESTS IN THE ALFALFA BIOTOPE, MEASURES TO CONTROL THE DOMINANT SPECIES

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ANNOTATION

As a result of research, it was observed that phytonutrients, alfalfa saplings, alfalfa sap, alfalfa seeds, along with rodents and locusts, which are specialized in alfalfa fields, cause great damage to plants. The distribution areas of these pests during the growing season, the dynamics of development, the degree of damage were studied and control measures were developed.

KEYWORDS. Alfalfa plant, vegetation period, agrobiocenosis, environmental conditions, pest, yield, dominant species, phytonomus, control measures.

INTRODUCTION

The territory of the Republic of Karakalpakstan is located in the northern part of Uzbekistan in the harsh agro-climatic conditions, and alfalfa has been cultivated for many years as an agricultural crop in the agrobiocenosis. According to the biology of alfalfa, it is a perennial crop that is sown mainly from seed in March, sprouts from April, and grows rapidly until the end of the growing season.

In order to accelerate the growth process in the spring, the seedlings are sown in the fall and germinate in the winter, and when the air temperature is from +1... +2°C it begins to grow. While the above-ground section is a high-grade fodder for livestock, the root system accumulates biological nitrogen in the soil and increases its productivity. In addition, due to the rapid growth of the plant, it is a biocenosis, which has the ability to accumulate many biological species in the biotope during the growing season.

Therefore, it was known that the role of insects, mites, microorganisms and other plants (harmful weeds) that directly affect the plant from the biocenosis fields that occur in the alfalfa biotope is high.

The role of insects of these species is important, and while the living conditions of many of them are necessary for the growth and development of alfalfa, those that feed on other plants are affected by their harmful properties.

Some of these pests feed from the time the alfalfa seedlings sprout until the end of the growing season, adversely affecting the aboveground part, while others damage the generative bodies.

Therefore, it is necessary to carry out control measures by studying the types of these pests, their developmental bioecology, level of damage, their spreading areas and dynamics.



Methods of the experiment. The types, developmental bioecology, dynamics of pests spread in the alfalfa biotope were determined with the help of the methods of B.P. Adashkevich (1983); Sh.T. Khujaev and others (2004); the degree of damage was determined using the methods of V.I. Tansky (1988). The method of conducting actions of control, determining the biological effectiveness of pest control measures was determined using the formula of Sh.T. Khujaev and others (2004), Abbot (Gar, 1963). The experiments were carried out using the method of B.A. Dospekhov (1986).

Results of the research. The results of research on the identification of pests that cause widespread damage in the biotope of alfalfa, the organization of measures to control them, mainly provide information on the alfalfa weevil, lucerne bug and alfalfa seed chalcid (Xujaev, 2010; 2015; Shamuratova, 2010; Torenliyazov et al., 2018).

As a result of research and monitoring conducted in 2016-2021, alfalfa weevil, lucerne bug, aphid, alfalfa seed chalcid, as well as rodent turnip moths and locusts, which adapted to alfalfa field, are considered to be the most common pests in there. The study of the dynamics of the habitats of these pests during the growing season provided data of theoretical significance for science.

The data obtained from the study of the development dynamics of the dominant species in terms of the degree of damage to alfalfa fields in recent years are given in Table 1.

As can be seen, the alfalfa weevil, which is the main pest of alfalfa, appeared from the third decade of March, and the number of worms reached its maximum in the second and third decade of April.

Of the species of rodent turnip moths that appeared in the alfalfa field, the eggs of the autumn turnip moth were found in the third decade of April, while the worms that fed on the plants in May were taken into account. From the beginning of May to the end of the growing season, the development of lucerne and plant bug generations was taken into account.

Among the species of pests spread in the alfalfa field, the dynamics of development of lucerne and plant bugs was slightly more active than others. Chemical control measures were carried out, taking into account the alfalfa weevil level of damage caused by the pest species and the fact that the worms can feed openly in the third decade of April (Table 2).

As can be seen, the biological effectiveness of the chemicals used in controlling alfalfa weevil in alfalfa fields has been proven to be high.

In the days following the use of the preparations, the biological effectiveness was 82.5-98.2%, and 14 days later, 92.5-98.2% of pests in the field were eliminated.

In addition to alfalfa weevil in the field, the development and damage of other pests has been stopped when treated with chemicals as expected.



Table 1
Dynamics of pests, which develop in alfalfa field
(Chimbay, Kegeyli, Nukus regions, years 2016-2020)

types	March			April			May			June			July			August			September		
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
Turnip moth (<i>Agrotis segetum</i> Den. et Schif.)	-	-	-	-	1,0	1,4	2,6	5,0	4,2	0,2	0,1	-	-	-	-	-	-	-	-	-	-
Italian locust (<i>Calliptamus italicus</i> L.)	-	-	-	-	-	-	-	1,4	2,2	3,1	4,2	4,5	2,1	-	-	-	-	-	-	-	-
Alfalfa weevil (<i>Phytonomus variabilis</i> Hbst.)	-	-	-	0,2	0,4	1,3	2,6	13,5	24,5	9,2	-	-	-	-	-	-	-	-	-	-	-
Lucerne bug (<i>Adelphocoris lineolatus</i> Coeze.)	-	-	-	-	0,2	0,6	1,3	1,8	2,4	2,4	2,5	3,5	4,4	4,8	5,3	6,4	8,6	4,2	3,1	1,2	0,6
Plant bug (<i>Lygus pratensis</i> L.)	-	-	-	-	-	0,2	0,4	0,6	1,3	1,8	2,1	2,8	3,1	3,2	3,6	2,4	1,9	0,6	0,8	0,9	1,0
Alfalfa seed chalcid (<i>Bruchophagus roddi</i> Guss.)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,1	0,6	0,3	0,4	0,2	2,4	-
Lawn bug (<i>Sitona cylindricollis</i> F.)	-	-	-	0,1	0,3	0,5	0,6	0,9	1,3	1,4	1,6	-	-	-	-	-	-	-	-	-	-
Bean aphid (<i>Aphis medicaginis</i> Koch.)	-	-	-	-	0,4	1,3	5,8	14,3	12,5	10,6	10,2	8,8	4,2	-	-	-	-	-	-	-	-

Table 2**Biological effectiveness of chemical preparations used in controlling alfalfa weevil**

(Nukus region, 2020.)

Preparations	Used amount	The number before applying	Biological effectiveness, %		
			1	7	14
Karate 5% em.k.	0,10	18,5	82,5	89,6	92,5
Karate 5% em.k.	0,15	19,1	91,3	94,5	96,8
Phuphanon 57 % em.k.	0,2	16,6	89,3	92,5	95,6
Phuphanon 57 % em.k.	0,6	18,3	90,3	93,5	98,2
Phelkill 20 % em.k.	0,6	20,2	88,3	94,6	96,3
Benzofosfat 30 % n.nuk.	3,2	17,6	93,2	95,1	97,4
Cipermetrin 25 % em.k. (etalon)	0,24	19,5	86,3	91,8	94,5
Control (without application)	-	17,8	18,1	20,3	21,9

Note: In control the number of pests in days after application, piece.

CONCLUSION

In the alfalfa biotope of the Karakalpak agrobiocenosis, in addition to plant-adapted pests, many species of agricultural pests have been identified. Along with alfalfa weevils, which are dominant in terms of damage, spreading areas, are required to account for the occurrence and damage of autumn turnip moth in the field. When chemical preparations are used for alfalfa weevil as the main pest of alfalfa in the area and 97.4-98.2% are destroyed, the effect of the method can adversely affect other pests, and it is proven that the dynamics, the degree of damage can be minimized.

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INHERITANCE FOR EARLY MATURITY OF F₁ HYBRID COMBINATIONS BASED ON AMERICAN AND MEXICAN COTTON VARIETIES IN KARKALPAKISTAN

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ANNOTATION

Due to the short growing season in Karakalpakstan, high-yielding, intensive, optimally constructed new plants have not been created yet. In order to solve this problem, it is possible to change the negative correlation between fastness, fiber yield, length and productivity by supporting different hybridization methods from the US and Mexican cotton collection. In order to create high-yielding and high-quality varieties, based on the study of collection samples brought from the centers of origin of cotton, as well as from the USA and Mexico, they were involved in crossbreeding them with regionalized and promising new varieties in the conditions of Karakalpakstan. As a result, F₁ plants with an intensive and optimal structure were superior to their parents in almost all combinations of quick-growing traits, and the possibility of selecting quick-growing genotypes was created. It was found that the quickness sign is a polygenic sign and depends on the genotype of the sample participating in the crossbreeding.

KEY WORDS: seed, heredity, hybrid, rapid maturation, hybridization, variability, hybridological analysis, reciprocal breeding, productivity, single selection, genotype, new collection samples.

INTRODUCTION

In recent years, the task of creating and producing medium fiber cotton varieties in Karakalpakstan has become more and more urgent. In this case, the issue of increasing the fiber yield of medium fiber cotton varieties is the most important. Simple hybridization has been widely used by breeders for many years. But most of this work is more focused on creating medium fiber varieties. Because there are special signs and characteristics of each variety. The fiber quality of these medium-fiber cotton samples corresponds to type V in the Karakalpakstan soil and climate conditions, but the fiber yield does not exceed 35.0-36.0 percent. The reason for this is that most of the seeds of *G. hirsutum* L type are hairy, yield, quick ripening and quality indicators are not high. Therefore, to date, the fiber yield of medium-fiber varieties differs sharply compared to varieties created in different soil and climate conditions. The continuous development of agriculture and technologies increases the demand for new varieties of agricultural crops. For example, the new variety has high yield, good fiber quality and fast ripening, as well as resistance to adverse environmental factors and many other characteristics it is necessary to create a medium-fiber cotton variety with an optimal structure of the bush obtained with the participation of American and Mexican variety samples.

According to O.E. Kochkarov, S.S. Alikho'zhaeva, S.A. Usmanov, F.A. Abrarova, B.K. Madratov [1], studying the adaptability of plants to various unfavorable conditions, determining the adaptation mechanism in which they are



resistant to unfavorable conditions and is of great importance in the principles of developing resistance to other discomforts.

According to I.A. Aliev [2], precocity is related to the height of the first harvest branch, the beginning of flowering and the rate of opening of pods.

Fast cooking is a complex polygenic trait, the length of the periods that determine it is variable to varying degrees. A number of genetic signs of early ripening, for example, the location of the first harvest horn, the number of bolls and the weight of cotton per boll, the number of seeds and its weight, the length of fiber and the accumulation of cellulose in it, are visible depending on the peak [3].

The results of recent research show that the effectiveness of creating hybrids and varieties suitable for soil and climate conditions for a high and high-quality cotton crop depends on the correct selection of the starting material. In order to create varieties that produce high and high-quality yields, it is an urgent issue to study the collection samples brought from the USA and Mexico, from the centers of origin of cotton, and to create starting material for intensive selection with the optimal structure of the bush, obtained as a result of crossing them with regionalized and promising new varieties in the conditions of Karakalpakstan.

Taking into account the above, it is necessary to study the new selection lines obtained from direct and reciprocal cross-breeding from the cotton collection in the natural soil and climate conditions of Karakalpakstan, that is, the best single selections picked in the field conditions are the main valuable farm. As a result of selection of complex, intensive, optimal structural forms of cotton, we aimed to use initial materials in practical selection works to create new varieties, while determining the variability of the signs.

RESEARCH METHODS

Researches were carried out in the laboratory "Cotton selection and seed production" of the experimental field of the Karakalpakstan agricultural scientific-research institute. Conducting experiments In 2017-2018, 100 samples of US and Mexican varieties were planted in the field of the institute in a general manner in the order of 60x25x1, in three rows, with 15 cells. During the growth period of the plants, the periods of germination, budding, flowering and opening of pods were observed and recorded, and valuable economic signs were determined. During the germination period, from the germination of the first tuber plant to the end of germination, plant wilting was determined every 2 days, and germination was determined at 50%. The obtained results were evaluated according to the difference compared to the new C-4727 taken as a measure

C-4727, Omad, Sultan, Chimboy-5018 and KK-3535 varieties regionalized in the Republic of Karakalpakstan were planted together with the isolated samples in 2020. During the growth period of the plants, the observation work carried out in previous years was fully returned.

Cross-breeding was carried out in the reciprocal order during the flowering period of the plants. F₁ plants obtained in 2021 were fully returned to the observation work carried out in previous years. The expected goal is to study the formation of the main economic and morphological characters in the hybrids obtained as a result of crossbreeding.

Selections from each hybrid combination and individual selections were harvested during pod opening. The weight of cotton in one bag, fiber yield and length, as well as quality marks were determined for these picked items. The fiber quality was determined by the HVI system in the regional laboratory "SIFAT" of the Republic of Karakalpakstan.



The obtained data were subjected to statistical processing in the style of B. A. Dospekhov [4].

$$X = \frac{\sum fX}{n}$$

$$S = \frac{\sqrt{\sum f(X_n - X)^2}}{n-1}$$

$$V = \frac{S \cdot 100}{X}$$

$$Sx = \frac{S}{\sqrt{n}}$$

here:

f – volatility index;

X- class average;

n- selection size;

Sx-mean arithmetic error;

V- variability coefficient;

S- average arithmetic mean;

The degree of dominance was calculated according to the formula of S. Wright according to the method presented in the work of Abdul Djalil Hassan Muhammad Al Harani [5] where:

$$hp = \frac{F_1 \cdot MP}{P - MP}$$

F₁ – average arithmetic index of the hybrid;

MP – average arithmetic index of parents;

P– arithmetic exponent of the best parent;

hp - dominance coefficient.

RESEARCH RESULTS AND THEIR ANALYSIS

Fastness studied in our experiments is one of the most important biological characteristics in agricultural crops. Maturity is determined by the duration of periods from germination to heading, from heading to flowering and from flowering to maturity.

A.A.Abdullaev, M.V.Omelchenko[6] stated that, regardless of which form is involved in hybridization, the formation will deviate towards the parent.

According to the research of U.Aitzhanov and I.J.Sagatdinov[7. 8], it was found that the cotton hybrids obtained with the presence of mutant varieties are 2.5-3.0 days earlier than the parent sample.

One of the most important characteristics of quick cooking is the opening period of the blisters. In our research in the soil and climatic conditions of the Republic of Karakalpakstan, the period of cotton to the opening of the F₁ plants was in the range of 103.5-114.7 days (Table 1). In particular, the F₁(S-4727 x 011782) hybrid with a positive result in this generation had a maturity of 104.7 days, and the difference from the parent was -5.0; It was 10.8 days. In the reciprocal form of this hybrid, the indicator was 106.9 days, and it was observed that it was -9.6 days earlier than the maternal material. Of course, we can see that the number 011782 collection sample is early, that is, it has a higher rate compared to the parents.

CONCLUSION

Based on the above analysis, it can be concluded as follows:

1. In the studied F₁ plants, a state of heterosis was observed in most of the combinations according to the sign of early maturity.

2. It was proved during our research that the early ripening sign in cotton is polygenic, like a number of other signs, and it was found that the early ripening of hybrids depends on the maternal or paternal participation of the samples involved in crossings and their genotype.

3. In the hybrid combination F₁ (S-4727 x 011843) that participated in our research, the period until the opening of pods was 108.8 days, while the period before the opening was 110.0 days when the variety C-4727 participated in



our research. In this case, it was observed that the hybrid was 1.2 days earlier than the variety C-4727, and 10.9 days earlier than the US sample number 011843, which participated as a father.

4. In the hybrid combination F_1 (011843 x C-4727) with the US sample as the mother, the early maturity of the hybrid was 106.0 days, and it was observed that it was 2.9 days and 4.9 days earlier than the parent sample. Also, the amplitude of the sign change in this combination was 1.6%.

5. In the studied F_1 (011761 x Chimboy-5018) and F_1 (011656 x Chimboy-5018) hybrid combinations, the ripening rate is 108.2, respectively; It was 109.0 days. The difference from the parent forms is $-3.7 +4.3$; and it was found to be $-5.4, +0.5$ days.

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A BRIEF REPORT TO STUDY RISK ASSESMENT OF CKD IN TYPE-II DIABETIC AND HYPERTENSIVE PATIENTS

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ABSTRACT

Chronic kidney disease (CKD) is a long-term pathological condition with loss of function over several months to years. In the present study the CKD risk assessment in diabetic, hypertension is assessed using CKD assessment questionnaire, GFR and other biochemical parameters. In the present study 1270 patients were identified with risk of CKD in which 250 patients were dropped due to various reasons, 1020 patients data was studied and analyzed as per our objectives. The findings suggest that the CKD risk is more in elder patients than younger patients with diabetics and hypertension. Females are at more risk to CKD when compared to males. When BMI was analyzed the Female Obese patients are 90% significant risk to CKD followed by obese male. 95% significant risk was observed for CKD in house wives, Govt employees followed by Private employees with sedentary life style. Family history of CKD in diabetic and hypertension was analyzed then there is no significant difference among them. When education status was analyzed in hypertension and diabetes patients then there is no significant difference among them. when GFR was analyzed then 95% significant risk was observed in stage-1 vs stage-3A, 95% significant risk was observed in stage-1 Vs stage-3B and 99% significant risk was observed between stage-1 Vs stage-5. It is concluded that increased age are at more risk, in Gender Females are more risk than males, in BMI higher BMI are more risk, Family history was Independent, in Occupation house wives are more risk, in GFR – Stage 5 are more risk and in Social history was Independent.

KEY WORDS: Age, Gender, BMI, GFR, Social history, family history, Occupation

INTRODUCTION

Chronic kidney disease (CKD) is a progressive loss of function over several months to years, characterized by gradual replacement of normal kidney architecture with interstitial fibrosis¹. CKD is categorized by the level of kidney function, based on glomerular filtration rate (GFR), into stages 1 to 5, with each increasing number indicating a more advanced stage of the disease, as defined by a declining GFR. This classification system from the National Kidney Foundation's Kidney Dialysis Outcomes and Quality Initiative (K/DOQI) also accounts for structural evidence of kidney damage. CKD stage 5, previously referred to as end-stage renal disease (ESRD), occurs when the GFR falls below 15 mL/min per 1.73 m² body surface area. The patient with stage 5 CKD requiring chronic dialysis or renal transplantation for relief of uremic symptoms is said to have ESRD².

About one in ten people have chronic kidney disease. African Americans, American Indians, Hispanics, and South Asians, particularly those from Pakistan, Sri Lanka, Bangladesh, and India, are at high risk of developing CKD. African Americans are at greater risk due to a prevalence of hypertension among them. As an example, 37% of End Stage Kidney Disease cases in African Americans can be attributed to high blood pressure, compared with 19% among Caucasians³. People with high blood pressure and diabetes are also at high risk of suffering from CKD than those people without these underlying conditions. About one of five adults with hypertension



and one of three adults with diabetes have CKD. Other health conditions that may lead to CKD are obesity, high cholesterol, a family history of the disease, lupus, and other forms of cardiovascular diseases. Chronic kidney disease was the cause of 956,000 deaths globally in 2013, up from 409,000 deaths in 1990⁴. In Canada 1.9 to 2.3 million people were estimated to have CKD in 2008⁵. The U.S. Centers for Disease Control and Prevention found that CKD affected an estimated 16.8% of U.S. adults aged 20 years and older in the period from 1999 to 2004⁶. UK estimates suggested that in 2007 8.8% of the population of Great Britain and Northern Ireland had symptomatic CKD⁷.

CKD development and progression is insidious. Patients with stage 1 or 2 CKD usually do not have symptoms or metabolic derangements seen with stages 3 to 5, such as anemia, secondary hyperparathyroidism, cardiovascular disease, malnutrition, and fluid and electrolyte abnormalities that are more common as kidney function deteriorates⁸. Uremic symptoms (fatigue, weakness, shortness of breath, mental confusion, nausea, vomiting, bleeding, and anorexia) are generally absent in stages 1 and 2, minimal during stages 3 and 4, and common in patients with stage 5 CKD who may also experience itching, cold intolerance, weight gain, and peripheral neuropathies⁹.

Susceptibility factors increase the risk for kidney disease but do not directly cause kidney damage. Susceptibility factors include advanced age, reduced kidney mass and low birth weight, racial or ethnic minority, family history, low income or education, systemic inflammation, and dyslipidemia. Initiation factors initiate kidney damage and can be modified by drug therapy¹⁰. Initiation factors include diabetes mellitus, hypertension, autoimmune disease, polycystic kidney disease, and drug toxicity. Progression factors hasten decline in kidney function after initiation of kidney damage¹¹. Progression factors include glycemia in diabetics, hypertension, proteinuria, and smoking. Most progressive nephropathies share a final common pathway to irreversible renal parenchymal damage and ESRD (Fig-1). Key pathway elements are loss of nephron mass, glomerular capillary hypertension, and proteinuria¹².

Angiotensin converting enzyme inhibitors (ACEIs) or angiotensin II receptor antagonists (ARBs) are used, as they have been found to slow the progression. They have also been found to reduce the risk of major cardiovascular events such as myocardial infarction, stroke, heart failure, and death from cardiovascular disease when compared to placebo in individuals with CKD¹³.

Low-protein, low-salt diet may result in slower progression of CKD and reduction in proteinuria as well as controlling symptoms of advanced CKD to delay dialysis start¹⁴. At stage 5 CKD, renal replacement therapy is usually required, in the form of either dialysis or a transplant¹⁵.

RISK FACTORS

DIABETES MELLITUS: It is a leading cause of CKD and ESRD in both developed and developing countries¹⁶. Mechanism that lead to kidney disease in diabetes include hyperfiltration injury, advanced glycosylation end products, reactive oxygen species. At the molecular level, numerous cytokines, growth factors and hormones such as transforming growth factor-beta and angiotensin II cause pathologic changes associated with diabetic nephropathy¹⁷. Eight percent of new patients with type 2 DM already have proteinuria at diagnosis. After the onset of proteinuria, the subsequent 10-year risk of progressive CKD is 11%¹⁸. Thus, about half of those with type 2 DM will develop nephropathy and 10% of these individuals will experience progressive loss of renal function¹⁹.

HYPERTENSION: Hypertension has long been a defined risk factor for both CKD and ESRD, and accounts for 27% of all ESRD patients in the United States and 28% of hemodialysis patients in Turkey²⁰. Systemic hypertension is transmitted to intraglomerular capillary pressure leading to glomerulosclerosis and loss of kidney function; thus variable risk of impaired renal function has been reported among hypertensive patients²¹. According to the MRFIT study, adjusted relative risk of reaching ESRD was 1.9 for high normal blood pressure,

For stage I, 6.0 for stage II, 11.2 for stage III, and 22.1 for stage IV hypertension²².

The main objectives of the study are designed to predict chronic kidney disease in hypertension and diabetic patients go through biochemical, other physical examination at regular intervals, and assess the risk of developing CKD in patients with hypertension and diabetes.

MATERIALS AND METHODS

A Prospective observational study was conducted at nephro, general medicine and surgery department in, a tertiary care hospital for a period of 18 months June (2020) to December (2021).

The data was collected from general medicine and surgery department by interviewing the patients or care providers. The data collection format was verified and authenticated by the hospital preceptors for the study. The data collection form mainly contains the demographic details of the patient and diagnosis {biochemical parameters and physical examination}, UNC Kidney Centre screening tool – Questionnaires. Study involved 1270 subjects.



Statistical Analysis: Descriptive statistics was done by using one way ANOVA by Bonferroni's Multiple Comparison Test to determine mean and standard deviation of collected data.

RESULTS

In the present study 1270 patients were involved in which 250 patients were dropped due to various reasons, 1020 patients data were studied and analyzed as per our objectives. As statistical analysis of the collected data was done by using one way ANOVA by Bonferroni's Multiple Comparison Test the resulted graphs /figures were obtained as per this test. **TABLE -1** indicates socio demographic background which includes standard deviation ,mean, score difference and CKD risk in various parameters as considered in our study .**FIGURE -1** describes the gender wise score of CKD assessment here, the significance score difference was observed between various age groups as show respectively male Vs female was 95% significant. This shows the risk of CKD in diabetic & hypertension is gender dependent. Male patients are at less risk factor when compared to female patients. While **FIGURE-2** express the age wise score of CKD assessment were, The significance score difference was observed between various age groups considered as 41-45 vs 46-50 was 90% : 41-45 vs 51-55 was 95% and in 41-45 Vs 56-60 & 61-65 was 99% significant. This indicates the risk of CKD in diabetic & hypertension is age dependent. Low age patients are at less risk factor when compared to higher age patients. The BMI wise score of CKD assessment score is seen in **FIGURE-3**. The significance score difference was observed between various age groups taken as Female Obese Vs Male Normal was 90%, which concludes the risk of CKD in diabetic & hypertension is BMI dependent. Normal patients are at less risk factor when compared to higher BMI patients. In case of Family history wise score of CKD assessment, the significance score difference was observed between various groups as show respectively are not significant. To sum up the risk of CKD in diabetic & hypertension is family history is independent as shown in **FIGURE-4**. Further more social history wise score of CKD assessment observed through **FIGURE-5**. Whereas significance score difference observed between various groups was not significant. Hence the risk of CKD in diabetic & hypertension is social history is independent.

However GFR wise score of CKD assessment by means of **FIGURE-6** shows that the significance score difference was observed between various groups as Stage 1 vs stage 3A was 95% ,Stage 1 vs stage 3b was 95% , Stage 1 vs Stage 5 was 99% and Stage 1 vs stage 4 was 95% significant. Thus the risk of CKD in diabetic & hypertension is age dependent. Patients with decrease in GFR are at higher risk factor when compared to higher age patients.

FIGURE-7 notes occupation wise score of CKD assessment. Here the significance score difference was observed between various age groups like farmer vs private employee was 95%, Govt employee vs private employee was 90% and private employee vs house wife was 95% significance. Therefore the risk of CKD in diabetic & hypertension is occupation dependent. Patients who are house wife's are at higher risk factor when compared to other patients. Finally **FIGURE -8** express Education status wise score of CKD assessment were significance score difference was observed between various groups was not significant. This shows the risk of CKD in diabetic & hypertension is education status is independent.



CKD Assessement Score based on Gender

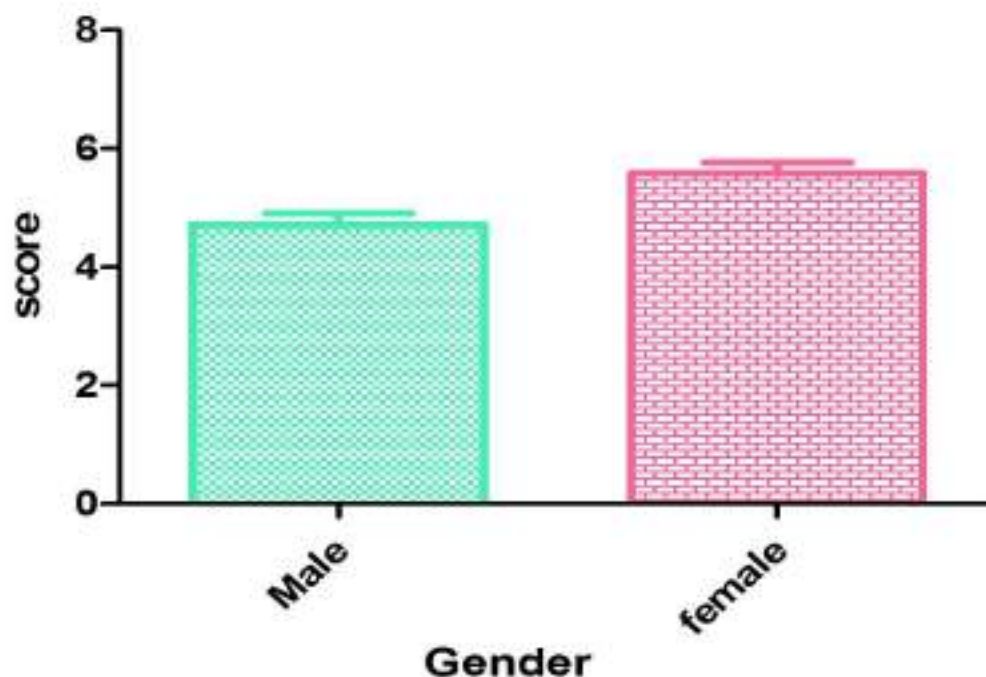
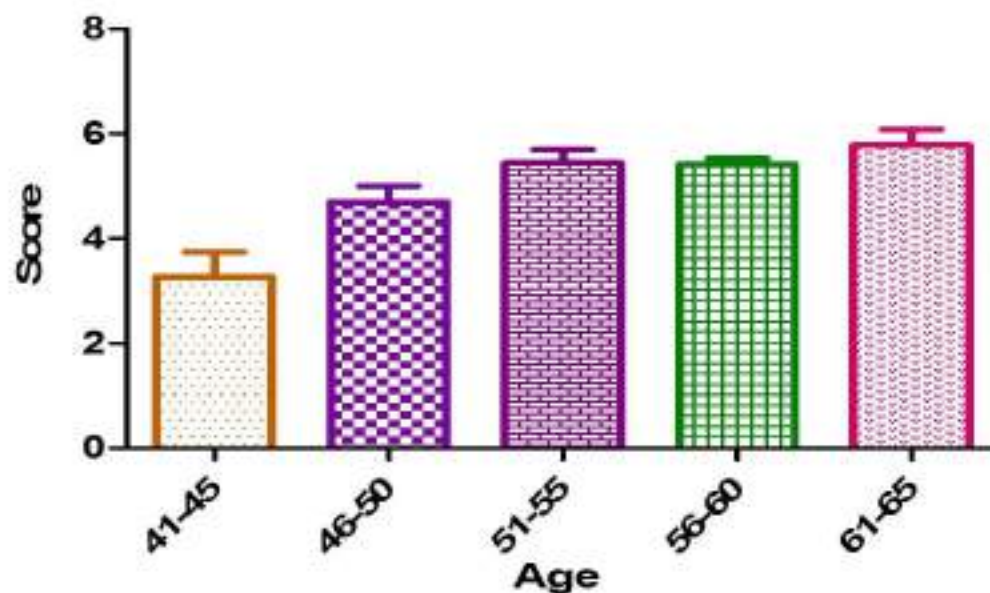


FIGURE-1 CKD ASSESSMENT SCORE BASED ON GENDER

Socio Demo Category	Sub Category		Mean And Standard deviation	Score Difference	CKD Risk In DM And HTN
Gender	Male		4.7 ±0.183	Significant	Dependent
	Female		5.58±0.183		
Age	41-45		3.27±0.46	Significant	Dependent
	46-50		4.70±0.311		
	51-55		5.44±0.259		
	56-60		5.41±0.117		
	61-65		5.79±0.300		
BMI	Male	Normal	4.63±0.249	Significant	Dependent
		Obese	4.84±0.279		
		Lean	5.00±0.01		
	Female	Normal	5.29±0.240		
		Obese	6.00±0.226		
		Lean	7.00±0.01		
GFR	Stage-1		3.86±0.329	Significant	Dependent
	Stage-2		4.86±0.229		
	Stage-3A		4.86±0.229		
	Stage-3B		5.45±0.303		
	Stage-4		5.91±0.285		
	Stage-5		7.25±0.250		



Family history	Father	5.54± 0.475	Not significant	Independent
	Brother	6.00± 1.00		
	Husband	6.00± 0.001		
	Father and brother	6.50± 0.500		
Social history	Alcoholic	5.54± 0.184	Not significant	Independent
	Smoker	6.00± 0.447		
	Toddy	6.00± 0.262		
	Alcoholic and smoker	6.50± 0.239		
Occupational	Farmer	5.27±0.001	Significant	Dependent
	Govt Employee	5.46± 1.00		
	Pvt Employee	4.19± 0.00		
	Housewife's	5.71± 0.500		
Educational	Illiterate	5.30±0.291	Not significant	Independent
	Primary	5.03±0.244		
	Secondary	4.58±0.417		
	Intermediate	5.75±0.629		
	Degree	4.15±0.406		

TABLE-1: Sociodemographics Details**CKD Assessement Score based on Age****FIGURE-2 CKD ASSESSMENT SCORE BASED ON AGE**



CKD Assessement Score based on BMI

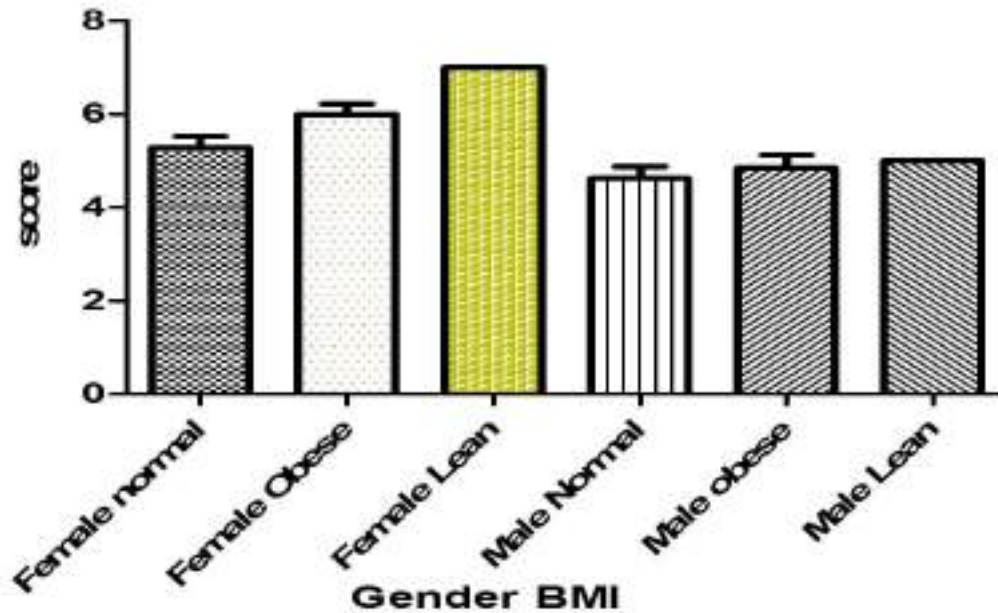


FIGURE-3 CKD ASSESSMENT SCORE BASED ON BMI

CKD Assessement Score based on Family History

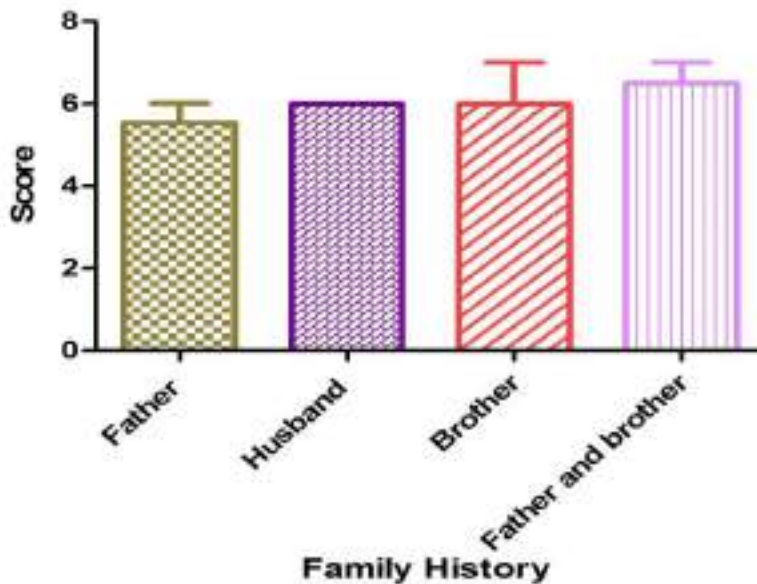


FIGURE-4 CKD ASSESSMENT SCORE BASED ON FAMILY HISTORY



CKD Assessement Score based on Social history

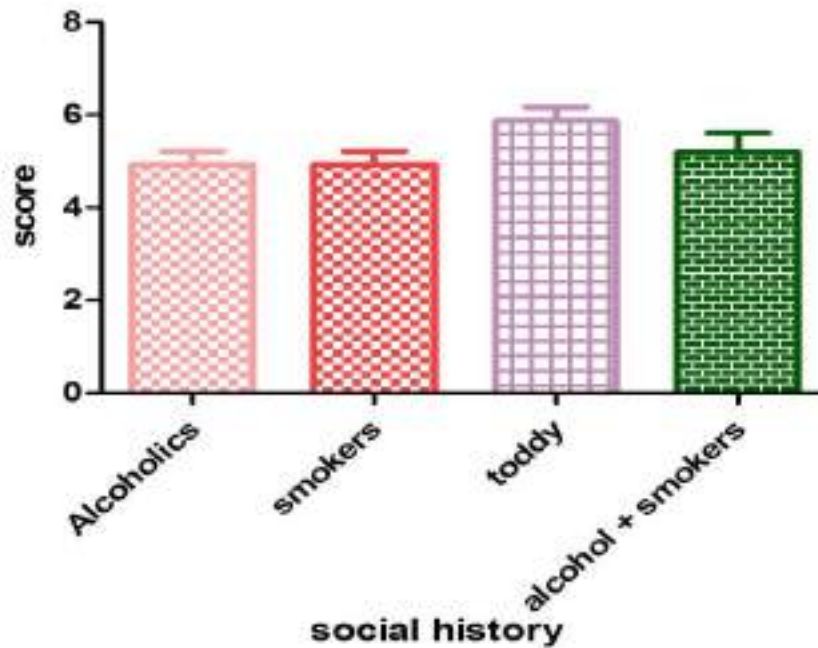


FIGURE-5 CKD ASSESSMENT SCORE BASED ON SOCIAL HISTORY

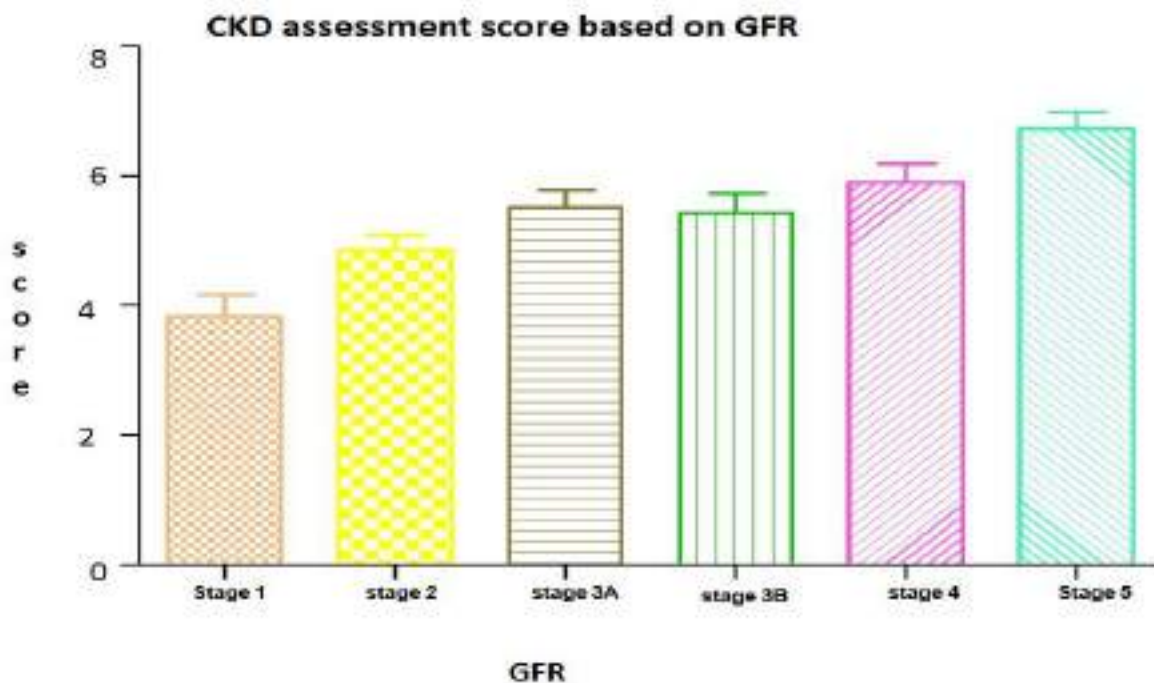


FIGURE-6 CKD ASSESSMENT SCORE BASED ON GFR



CKD Assesment Score based on Occupation

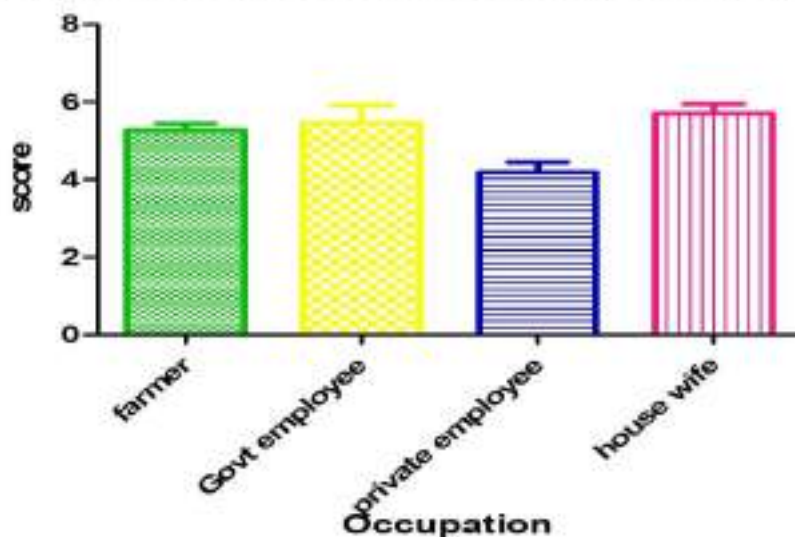


FIGURE- 7 CKD ASSESSMENT SCORE BASED ON OCCUPATION

CKD Assesment Score based on Education Status

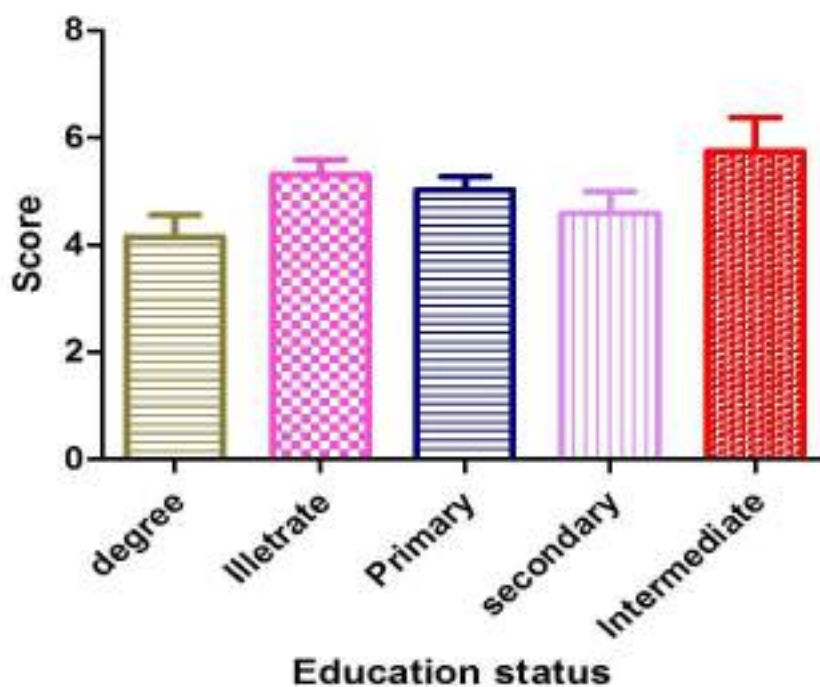


FIGURE-8 CKD ASSESSMENT SCORE BASED ON EDUCATION STATUS



DISCUSSION

“An Observational study For Risk Assessment Of CKD In Type-II Diabetic And Hypertensive Patients “, was conducted in a tertiary care hospital considering patients from nephro, general medicine and surgery department. The data was collected for 1270 patients using data collection forms.

Gender wise score of CKD assessment states the risk in diabetic & hypertension is gender dependent. Male patients are at less risk factor when compared to female patients. Whereas the study conducted by Po-Ya²³ Chang determined sex-specific prediction models for risk factors for renal progression. Moreover, we revealed proteinuria as the most crucial risk factor for male patients and poor glycemic control as the crucial risk factor for female patients. Poor blood pressure control was a mutual risk factor for male and female patients.

The age wise score of CKD risk assessment in diabetic & hypertension is age dependent. Low age patients are at less risk factor when compared to higher age patients. As per the study conducted by Rumeyza Kazanciog lu²⁴ Renal function decreases with age in both men and women. Among the elderly population, more than one-half of the subjects screened had CKD stages 3–5 (GFR_o60 ml/min per 1.73m²) according to the National Kidney Foundation Kidney Disease Outcomes Quality Initiative (K/DOQI) guidelines²⁵. Thus, the elderly population is more prone to develop CKD after various renal insults as similar to our results.

According to the study conducted by Maria valeria pavan²⁶ .One of the strongest yet modifiable risk factors for ESRD in the twenty-first century is obesity. Glomerular hypertrophy and hyper filtration may accelerate kidney injury by increasing capillary wall tension of the glomeruli and decreasing podocyte density. Obesity may contribute to the pathogenesis of kidney damage through inflammation, oxidative stress, endothelial dysfunction, prothrombotic state, hypervolemia, and adipokine derangements²⁷. Infact our study BMI wise score of CKD risk in diabetic & hypertension is BMI dependent. Normal patients are at less risk factor when compared to higher age patients.

The Family history wise score of CKD e risk in diabetic & hypertension is family history is independent. However study performed by Dept of nephrology²⁸ mostly father diabetic patient may also have diabetes which may be predisposing factor of CKD. In social history wise score of CKD assessment score were not significant. This shows the risk of CKD in diabetic & hypertension is social history is independent. But study conducted by McClellan WM²⁹, Smoking can increase the CKD risk through pro inflammatory state, oxidative stress, prothrombotic shift, endothelial dysfunction, glomerulosclerosis and tubular atrophy.¹⁸ In a study where 7476 non diabetic participants were enrolled, smoking 420 cigarettes per day increased the risk of CKD.²² In another study, each additional five smoked cigarettes per day was associated with an increase in serum creatinine 40.3 mg/dl by 31%³⁰.

GFR wise score of CKD assessment in diabetic & hypertension is age dependent. Patients with decrease in GFR are at higher risk factor when compared to higher age patients. Occupation wise score of CKD risk assessment in diabetic & hypertension is occupation dependent. Patients who are house wives are at higher risk factor when compared to other patients.

Education status wise score of CKD assessment were not significant. Thus the risk of CKD in diabetic & hypertension is education status is independent. Even though the study conducted GramsME³¹ et al by said that illiterate are at more risk of CKD than other individuals.

CONCLUSION

Chronic kidney disease (CKD), also called as chronic kidney failure, means a gradual loss of kidney function over time, i.e. it has lasting damage to kidneys that can get worse over time. If the damage is severe, kidneys may stop working. This is called kidney failure and it means there is need for dialysis or a kidney transplant.

CKD is when kidneys are damaged and lose their ability to filter waste and fluid out of blood. Waste can build up in body and harm your health of individual. Kidney failure or end-stage renal disease (ESRD) is when kidneys have stopped working well enough for individual to survive without dialysis or a kidney transplant.

On the whole In order to assess the risk factors in patients with diabetes and hypertension, A prospective observational study has been initiated, thus a total of 1270 cases have been enrolled out of which 1020 were selected into the study were factors like Age, Gender, BMI, Family history, Social history, occupation, GFR were used to assess the risk factor. Both males and females of different age groups have been observed through the study, which concluded that

Age – risk of CKD gradually increasing with age. **Gender** – Females are at more risk than males. **BMI** – Higher BMI is risky.

Occupation – house wives are more in risk. **GFR** – Stage 5 are at higher risk, where as factors like family history, social history and educational status are independent in risk assessment.

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ASSEMBLY, TEST OF RADIO JOVE KIT TO TRACK SOLAR AND JUPITER RADIATION

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ABSTRACT

A radio JOVE telescope receiver and dipole antenna were assembled, characterized and tested to detect extraterrestrial signals from planet Jupiter. Two element dipole arrays were built for the detection of 20.1MHz radio emission from the Jupiter-Io interaction, strong solar burst, the galactic background and the transit of the galactic center. Using the specifications and the layout, the dipole array was constructed. The block diagram, the schematic diagram built for NASA was used to solder together the radio frequency band pass filter, audio Preamplifier and audio amplifier to make the radio JOVE receiver. This was characterized, tested and tuned by setting the tuning knob to 20.0MHz. The dipole antenna was connected to the receiver and a variety of radio frequency emissions were detected. These signals were captured on a personal computer via the radio Jupiter Pro 3.8.3 and radio skypipe 2.6.5 software compatible with windows 7 OS and has python programme which converts data from the sod format to ASCII format to conveniently analysed them. The device was confirmed working as the assembled Radio JOVE kit sends signals to system and were captured by the software on the system.

KEYWORDS: Dipole Antenna; Solar Burst; Galaxy; Radiotelescope; skypipe

INTRODUCTION

Radio astronomy is a subfield of astronomy that studies celestial objects at radio frequencies. Before 1931, to study astronomy meant to study the objects visible in the night sky. Indeed, most people probably still think that's what astronomers do—wait until dark and look at the sky using their naked eyes, binoculars, and optical telescopes, small and large. Before 1931, there was no idea that there was any other way to observe the universe beyond our atmosphere. (www.skatelescope.org/radio-astronomy)

Radio telescopes are instruments used to detect radio emissions from the sky, whether from natural celestial objects or from artificial satellites. They are in all shapes and sizes based on the kind of radio waves they pick up. However, every radio telescope has an antenna on a mount and at least one piece of receiver equipment to detect the signals..

Radio signals from Jupiter and the sun are very weak - they produce less than a millionth of a volt (1 microvolt, 1 μ v) at the antenna terminals of the receiver. These weak radio frequency (RF) signals must be amplified by the receiver and converted to audio signals of sufficient strength to drive headphones or a loudspeaker. The receiver also serves as a narrow filter, tuned to a specific frequency to hear Jupiter while at the same time blocking out strong earth based radio stations on other frequencies. The receiver and its accompanying antenna are designed to operate over a narrow range of short-wave frequencies centered on 20.1 MHz (megahertz). This frequency range is optimum for hearing Jupiter signals.

The antenna intercepts weak electromagnetic waves which have traveled some 500 million miles from Jupiter to the Earth. When these electromagnetic waves strike the wire antenna, a tiny RF voltage is developed at the antenna terminals. Signals from the antenna are delivered to the antenna terminals of the receiver by a coaxial transmission line.

MATERIALS, ASSEMBLING AND OPERATION

Description of Antenna and Receiver

The standard Radio Jove kit consists of parts to assemble two half-wave dipole antennas, coaxial cable, parts to build a radio receiver, PC software, and a manual.

1. The Radio Jove antenna consists of wire, coaxial cable, insulators, connectors, and other parts. The kit consists of two identical half-wave dipole antennas, which can be phased together with a feed line. Some soldering skills are required, as well as accurate measuring and cutting.



2. The receiver kit consists of 100 parts, including electronic components, solder, wiring, a circuit board, simple tools and a case. The receiver is “tuned” to a relatively narrow band of frequencies centered at 20.1MHz. It is powered by a 12V DC source, and outputs an amplified signal sufficient for listening over headphones or a powered speaker, and to provide a signal at the microphone input port on a personal computer. Assembly of the receiver is relatively straightforward, however some knowledge of solder and ability to identify electronic components is required.
3. The receiver works by taking the weak signal from the antenna and filtering out frequencies outside of a narrow band around 20.1 MHz, converting the frequencies to the KHz audio spectrum, and amplifying the signal. Filtering is accomplished by pairing capacitors, which resist direct current but pass oscillating current, with inductors, which resist changing current. Capacitors store the energy of resistance as an electric field, and inductors store energy collected as a magnetic field. Properly “tuned”, capacitors and inductors will swap energy between their electric and magnetic fields at a specific frequency, or resonance. The receiver takes advantage of this capacitor-inductor resonance to augment signals at approximately 20.1 MHz and dampen other frequencies. The direct conversion of the MHz frequency to KHz is accomplished by subtracting the received signal from a reference signal generated by an oscillator in an integrated circuit, or IC. The difference, for example from .001MHz to .01MHz, is a KHz signal in the audible range. Two integrated circuits and two transistors amplify the output signal, and one JFET transistor amplifies the incoming signal.
4. The Radio-Sky Pipe software provided in the kit enables the observer to record and store observations, provides visual feedback as to the strength of the signal being received on a real-time basis, and enables the observer to share results with other observers over the internet. The software is copyrighted by Radio-Sky Publishing, and further information can be found on their web site at <http://www.radiosky.com/>.

MATERIALS AND METHOD

List of Radio Jove antenna parts

Parts included in the Radio JOVE Antenna setup

- 1 50 ft. (15.24 m) #14 Gauge Bare Copper Wire (7-stranded)
- 1 70 ft. (21.336 m) RG59U Coaxial Cable (Beldon 8241)
- 4 WOODEN End Insulators (cylinders)
- 2 Plastic Center (dog bone) insulators
- 4 Twist-on F-connectors
- 1 Power combiner / splitter (2-to-1)
- 6 Ferritatoroids
- 1 100 ft. (30.48 m) x 3/16 in. Nylon Rope
- 4 10 ft. (3.048 m) x 1 in. WOODEN pipes (Sch 40)
- 4 1 in. WOODEN End Caps
- 4 1 in. WOODEN Couplers
- 4 3-4 in. x 3/8 in. Bolts
- 4 3/8 in. Nuts
- 1 Small can of WOODEN Cement (optional)
- 6 Tie wraps (optional)

Tools

- Soldering Iron (RS 64-2070C)
- Solder, 60/40, 0.050 in diameter rosin core (RS 64-006), or finer
- Wire Cutters (RS 64-1833) and Wire Strippers (RS 64-2129)
- X-acto Knife (or equivalent)
- Scissors
- Tape measure (at least 12 ft. is best)
- Small screwdriver and pliers
- Crescent Wrench
- Drill with > 1/4 in. and > 3/8 in. drill bit



Theory of Operation – Antenna

The antenna intercepts weak electromagnetic waves that have traveled some 500 million miles from Jupiter to the Earth or 93 million miles (1 Astronomical Unit = 1 AU) from the Sun. When these electromagnetic waves strike the wire antenna, a tiny radio frequency (RF) voltage is developed at the antenna terminals. Signals from each single dipole antenna are brought together with a power combiner via two pieces of coaxial cable. The output of the power combiner is delivered to the receiver by another section of coaxial transmission line.

The antenna system requires a fair-sized area for setup: minimum requirements are a 25 x 35 ft. flat area that has soil suitable for putting stakes into the ground. Since the antenna system is sensitive to noise it is best not to set it up near any high tension power lines or close to buildings. Also for safety reasons, please keep the antenna away from power lines during construction and operation. The best locations are in rural settings where the interference is minor. Since many of the observations occur at night it is wise to practice setting up the antenna during the day to make sure the site is safe and easily accessible.

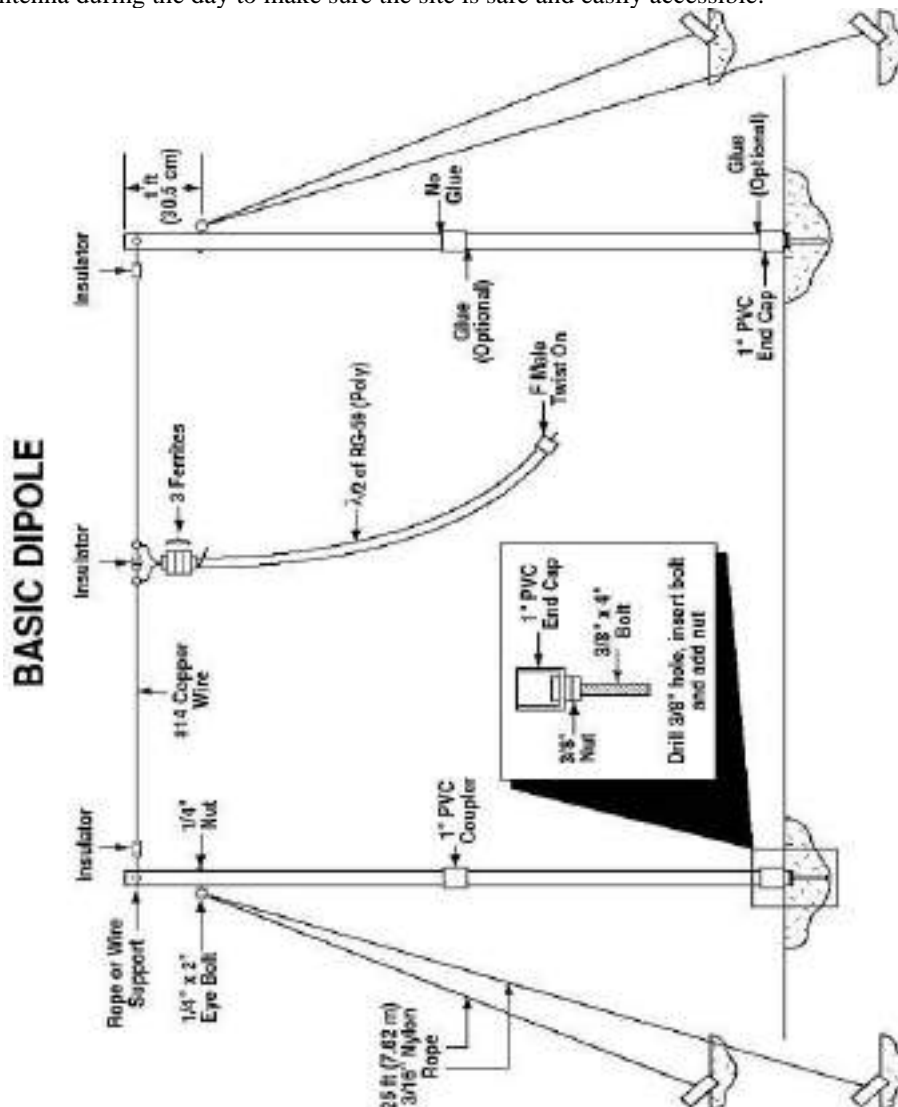


Fig 1: Setting up the Antenna



The Dipole Antenna Assembled

Wires cut and Ropes measured - Copper wires were cut accurately to 23.3 feet's, while the coaxial RGB cables were cut; the Insulators wrapped; the Coax prepared and Soldered; All the individual wires were twisted together to form one continuous wire . The insulation around the center conductor were stripped, the coaxial cable looped over the center insulator. The coax center conductor and shield to the copper wires were soldered together. The Toroids and Connectors installed (The Coax and F-connector)

The Mounting Structure Assembled

1. The 10 ft. (3.05 m) wooden planks were cut into sizes giving allowance for the 1 feet (30.5cm) to go underground for greater stability.



2. Holes drilled in the wooden plank for the bolts and wires.
3. 4 eyebolts and nuts were attached to the wooden planks at the hole drilled 1 foot (30.5 cm) below the top of the four poles

Field Setup of Dipole Antenna

- 1) We laid out each dipole antenna flat on the ground with the ends of each dipole facing in the EAST-WEST direction (Figure 9a). Separate each dipole by about 20 feet (6.3 m). When the antenna is completely setup, the dipole wires are horizontal to the ground and the ends are pointing in an EAST-WEST direction.

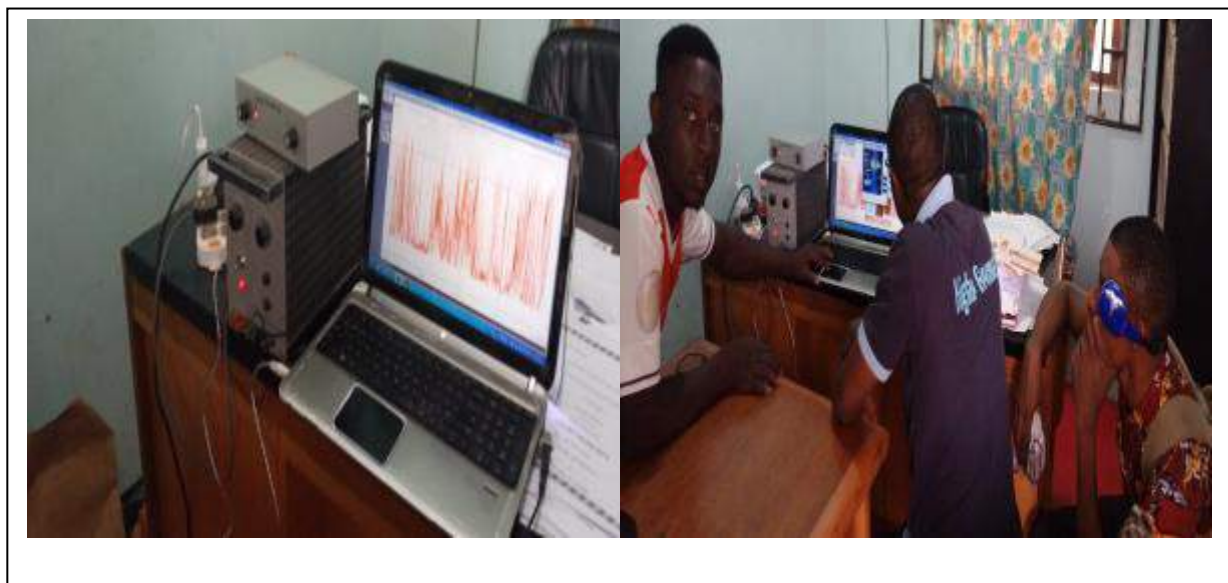


- 2) Using one 25 ft. (7.6 m) section of rope, we looped it twice through an eyebolt (Figure 8c). and then tied loops into each end of the rope.
- 3) One person held up the pole straight while one or two others attach the rope loops to the tent stakes and push them into the ground (Figure 9b). We push them in at an angle where the top of the stake faces away from the pole. Once the pole is fairly secure, the foot of the pole (protruding bolt) is pushed into the ground to add stability.
- 4) Steps 2 and 3 were repeated for the other pole making sure the poles stay vertical. The WOODEN poles will flex and show some bending, but that is okay. Make sure that the guy ropes are secure enough that the wire antenna is roughly horizontal (not too much sagging). Do not tighten the guy wires too tight because this will cause undue stress on the dipole antenna.
- 5) At a North-South distance of 20 ft. (7.6 m) from the first dipole, steps 2-4 were repeated and set up the other half of the antenna was done. We made sure both antennas were parallel and were roughly facing in the EAST-WEST direction



ii. Coaxial Cables of the Antenna connected to JOVE Receiver

- 1) The two coaxial feed lines connected to the power combiner on the twin-side by screwing on each F-connector to the threads of the combiner
- 2) The 1λ coaxial cable (long coax) connected to the single-side of the power combiner.
- 3) Connect the other end of the 1λ coax to the antenna input on the JOVE Receiver.



Assembly of the Receiver

The receiver, antenna and software are part of the Radio Jove kit, purchased by the researchers with funds from TETFUND via the IBR Grant. The equipment contained in the kit is designed to observe the Sun and Jupiter at a frequency of 20.1MHz.



THE RECEIVER

The Radio Jove receiver is very simple to operate, including only a tuning and volume knob. During assembly, the receiver is adjusted to receive a signal at 20.1MHz when the tuning knob is in the 12 o'clock position. When making observations, the observer tunes the receiver to find a frequency with as little artificial interference as possible. Since the unit is built to receive only a narrow band of frequencies, the frequency used for observation will tend to be between 20.0MHz and 20.2MHz. Once the software was started and the initial conditions set, a moving graph appeared which showed the strength of the signal being received.

RF Bandpass Filter and Preamplifier

Signals from the antenna are filtered to reject strong out-of-band interference and are then amplified using a junction field effect transistor (JFET). This transistor and its associated circuitry provide additional filtering and amplify incoming signals by a factor of 10. The receiver input circuit is designed to efficiently transfer power from the antenna to the receiver while developing a minimum of noise within the receiver itself.

Local Oscillator and Mixer

The local oscillator (LO) and mixer perform the important task of converting the desired radio frequency signals down to the range of audio frequencies. The local oscillator generates a sinusoidal voltage wave form at a frequency in the vicinity of 20.1MHz. The exact frequency is set by the front panel tuning control. Both the amplified RF signal from the antenna and the LO frequency are fed into the mixer. The mixer develops a new signal which is the arithmetic difference between the LO and the incoming signal frequency. Suppose the desired signal is at 20.101MHz and the LO is tuned to 20.100MHz. The difference frequency is therefore $20.101 - 20.100 = .001$ MHz, which is the audio frequency of 1 kilohertz. If a signal were at 20.010MHz it would be converted to an audio frequency of 10 kHz. Since the RF signal is converted directly to audio, the radio is known as a direct conversion receiver.

Low Pass Filter

To eliminate interfering stations at nearby frequencies, we use a filter which was like a window a few kilohertz wide through which Jupiter signals can enter. When listening for Jupiter or the Sun, the radio will be tuned to find a "clear channel." Since frequencies more than a few kilohertz away from the center frequency may contain interfering signals, these higher frequencies must be eliminated. This is the purpose of the low pass filter following the mixer. It passes low (audio) frequencies up to about 3.5 kHz and attenuates higher frequencies.

Audio Amplifiers

The purpose of the audio amplifiers following the low-pass filter is to take the very weak audio signal from the mixer and amplify it enough to drive headphones directly, or to drive an external amplified speaker assembly.

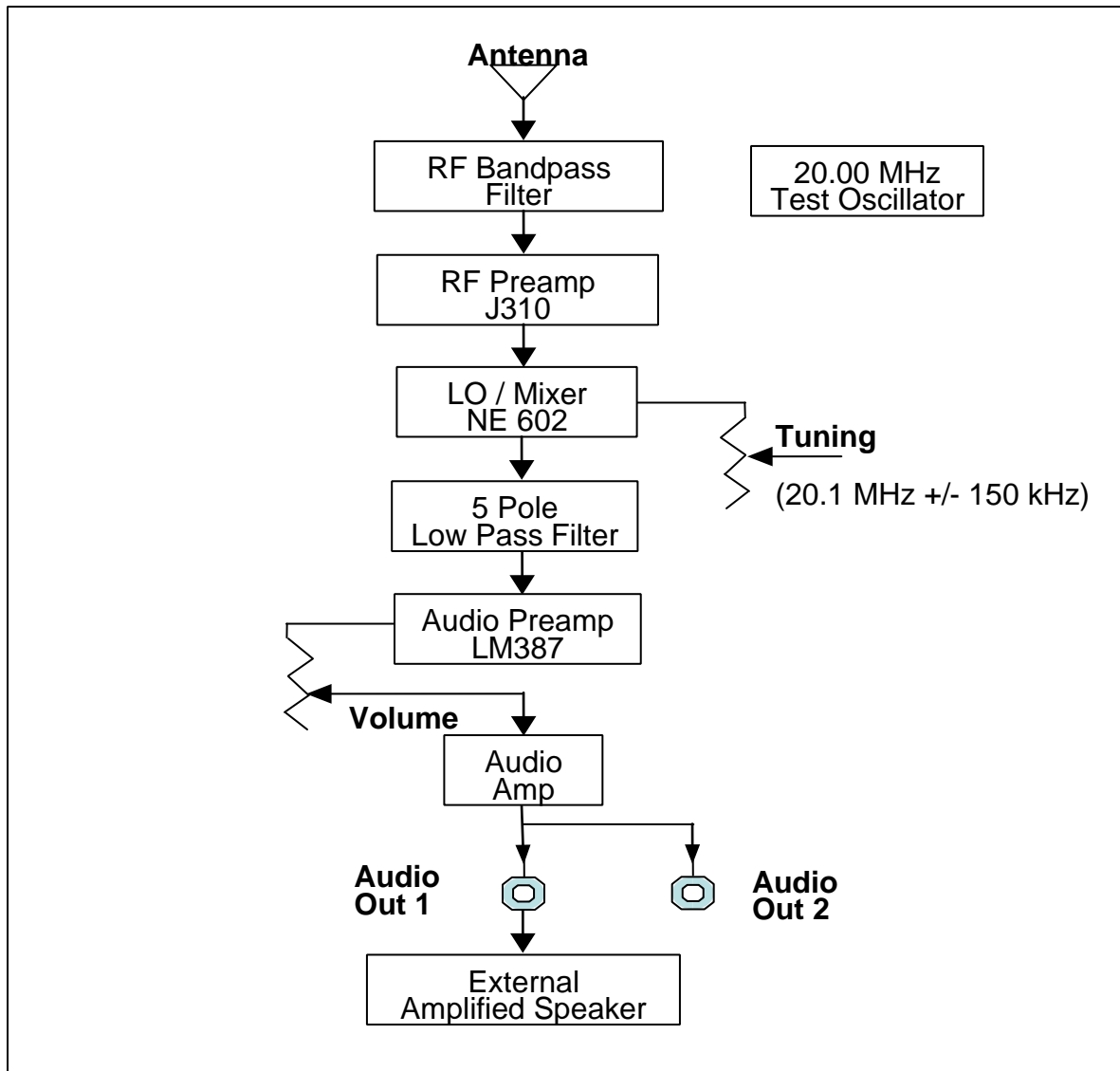


Figure 3: JOVE receiver block diagram

OBSERVATION

The researchers conducted half-day sessions using the assembled kit, laptop computer and Radio-Sky Pipe software. Using the program to conduct observations was reasonably simple, but requires much sensitivity. The normal observing set-up included routing the antenna through a step-calibration device and an additional filter before being plugged into the receiver. One audio output was connected to a battery-powered speaker and the other was connected to the microphone input port of a laptop. A 12v power supply was connected to the receiver.

CONCLUSIONS

The research involved a start-up investigation of extraterrestrial radio frequency signals. A very low frequency receiver called the radio JOVE receiver was assembled using the circuit schematics. A dipole antenna was also constructed, after all necessary testing have been completed, the JOVE receiver was connected to the RGB coaxial cable of the dipole antenna. Softwares were used to



captured the signals from about 500 million miles from the Jupiter and 93 million miles from the sun to our personal computer and outlined the strength and variations of these signals. The device was tested and confirmed working to amplify radio frequency signals from Jupiter.

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A STUDY ON THE STOCK MARKET INVESTMENT DECISIONS OF CORPORATE EMPLOYEES WITH RESPECT TO BENGALURU

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ABSTRACT

The following study aims to examine the influencing factors which are affecting corporate investor behaviour in the stock market and it is trying to find out perception of corporate investors regarding various considerations kept in mind while investing in the stock market. Analysis of stock market movements is very important for investor; therefore it attracts many scholars to conduct research. The investment behaviour seems very challenging; this behaviour is due to different factors like condition of financial statement, current economic indicator, history and futuristic data, the result of technical analysis, internal and external influence. It is important for the corporate investors to keep themselves up to date and financially literate about the stock market and its affecting factors.

This study used primary data which is collected from 150 corporate investors through structured questionnaire to measure the behaviour of investment decision. Through convenient sampling the data was collected from respondents. The Anova and chi square tools were used to examine the corporate investor's behavioural intentions with financial considerations in the stock market investment.

The result of this study shows that investor simply react to the available information and act accordingly. Lot of consideration is required to deal with before, after and while investing in the stock market. Investor should try to make financial analysis and influencing factor analysis before investing on any shares and they must look into all avenues while investing into different shares. Consideration of influencing factors is sector specific and it helps in understanding the investment behaviour. Technical and financial analysis about the company and fundamental analysis of the economy is taken into account while investing in the stock market. Investment in stock market has high risk compared to other financial instruments. Therefore this study has significant implication on policymakers, Stock market regulators and financial service providers.

KEYWORDS: Stock Market, Shareholder, Stocks or shares, Portfolio, dividend.

INTRODUCTION

The following research is a study of the Stock Market investment decisions of corporate employees. The stock market is the platform where trading of listed companies stocks held, Stock market activities are done in stock exchanges, and these activity is continuously observed by regulatory authority of stock exchange. In the beginning, if the company want to collect the funds, first thing, it has to be listed in the stock exchange; this is said to be an initial public offering. These listed stocks are further used for trading in stock exchange. Employee stock option is one of the ways for the companies to motivate their employees to be more productive. Through stock option scheme, a corporate employee receives a percentage of ownership in the company, which is making them to understand the stock investment. To earn high return with safe investment in the stock market, investors has to properly analyse the company background such as revenue, profit, earnings per share, cash balance, market share, sales, and the demand of the product in the market. Once after analysis of the company's data, they can buy the shares of analysed company, either in small amount or in huge amount. Investors are more curious while putting resources into the securities, investment in stocks has high risk compared to other financial instruments. Corporate investor's investment decision is an area of interest to researchers. Investor should consider many factors before, during and after making investment decision in the stock market. The study focused on various influential factors which are affecting corporate employee's investment decisions. There are different factors, which are affecting corporate investors in taking specific choice of investment.



OBJECTIVE OF THE STUDY

- To identify the corporate investor preferences in the stock market and the limitations.
- To suggest strategies from which the investors can rearrange their return on investment.

HYPOTHESIS

H0: There is no impact of the gender upon the portfolio selected

H1: There is an impact of the gender upon the portfolio selected

H0: There is no impact of the Age group upon the portion of saving used for stock market investment.

H1: There is an impact of the Age group upon the portion of saving used for stock market investment.

STATEMENT OF THE PROBLEM

It is observed that investors are more interested towards particular type of investment choice and preferences. So, it is important to study the factors that are influencing investment options, it plays a crucial role in determining the behaviour of investors and its effect; as a result, proper use of money can be seen. This research will help not only the investors but also the different financial institutions, organizations and consultants in studying and understanding the main factors that motivates investors to invest in different alternatives and their decision making practice. A better consideration of behavioural procedures and results is important for financial planners because a thoughtful consideration of corporate investor's perception towards various investment alternatives should help financial advisors to suggest suitable asset distribution strategies to their clients.

REVIEW OF LITERATURE

According to author, "Sameer Yadav" (2017) reviewed Stock market volatility, the stock market determines the risk in the share, volatility is the statistical measure given in the market index, if the volatility is higher, and the risk associated is more, volatility causes due to changes in the inflation. *According to author "Shiva Kumar Pandey" (2019)* a Project report on Indian stock market, states that price of the stock changes according to the supply and demand chain running in the stock market. There are several factors, which has influenced prices of the shares, important is earnings to buy the stock one can use brokerage or dividend reinvestment plan available in the society, market of safe securities are the good thing of economy. According to author, there is only limited number of currencies, which are traded in the future market in standardised amount using online mode of payments. *According to author "Swetha .R" (2020)* a project report on online trading of stock market submitted. As per the study business knowledge will keep changing based on situations of day to day, survival in the business is greatest achievement, stock market listing is one of the survival strategy of any business, which is mostly used in the competitive world. Early in the stock market, the process was going in paper mode and as per current situation; it is taking place through online mode. Even with covid pandemic arises in India, the stock market recovered with hikes and reaches the economic recovery of India. *According to authors "Priyadarshini Arumugam, Kumar kantipudi, Shalavika B" (2021)* conducted a study of Analysis on stock prices of IT companies states that the fastest growing industry in the world is IT sector, the authors selected five companies TCS, Infosys, Wipro, HCL and techmahindra. The prices were down, during the period of Jan 2020 to December 2020, this made the investor to lose hope in the share market. *According to author "Adharsh ton" (2021)* a Study on Indian stock market - NSE and BSE .As per the study the Indian stock market developing with very good quality, inputs and investors are protected with disclosure norms. Now the trading done through advanced technology, transparent and self-driven, now Indian companies is started integrating with global markets, even with pandemic came to India, markets of India recovered with large hikes.

Above authors have studied on different investors groups. In this paper the concentration is made on corporate investors, now day's corporate employees they are allotted with ESOP (Employee stock ownership plan) which is making them to understand the stock investment and this study will help to understand the corporate employee's preference to stock market.

RESEARCH METHODOLOGY

To conduct the following research convenient sampling method is used, which fall under random sampling technique, the scope of the study limited to 150 corporate employees between the age group of 20 to 60 years, they were asked with short questionnaire, the study limited to very short period of time, the data was collected through questionnaire, the data was analysed using different tools and techniques like Annova, chi-square and correlation. The study is limited to Bengaluru city only. The respondents were not disclosing some exact data due to confidentiality. The study was done on stock market investments even there are many investment alternatives available to the investors.

DATA ANALYSIS AND INTERPRETATION

Data analyzed output of One-way Annova in SPSS software

Analysis of the Variance, i.e. ANNOVA in SPSS, is used to check the difference in the mean value of dependent variable to independent variables. ANNOVA will help to analyze the difference in the means between two independent variables. It is not giving which statistical groups is different to each other, if the test returns a significant f-statistical value, it is needed to run an adhoc test to tell exactly that, which groups had a difference in the means.



H0: There is no impact of the gender upon the portfolio selected

H1: There is an impact of the gender upon the portfolio selected

Oneway

(DataSet3) C:\Users\AJIT\Documents\JAYALAKSHMI_FINAL_PROJECT.sav

Descriptives

GENDER	N	Mean	Std. Deviation	Std. Error	85% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
HIGH RISK-HIGH RETURN	84	1.65	.501	.055	1.44	1.66	1	2
MODERATE RISK-MODERATE RETURN	46	1.48	.505	.074	1.33	1.63	1	2
LOW RISK-LOW RETURN	20	1.35	.489	.109	1.12	1.58	1	2
Total	150	1.60	.502	.041	1.42	1.58	1	2

ANOVA

GENDER					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.602	2	.301	1.321	.370
Within Groups	36.838	147	.251		
Total	37.500	149			

P value generated in the test is 0.270

This table showing the output of ANNOVA analysis, the significance of (p) value is 0.270 it is not less than 0.05, then there is no significant difference in male or female with respect to portfolio suitable for investment, therefore Null hypothesis is accepted.

Data analyzed output of Chi square in SPSS software

The chi square statistics appear in the Value column of Chi-Square. Test data in the SPSS statistics it is immediate to the right of "Pearson Chi-Square". The result generated is significant, if the value is equal to or less than the alpha level that is 0.05, and if the p-value is smaller than the standard alpha value, then we reject the null hypothesis that designates that two variables are independent of each other. If the p-value is greater than the standard alpha value, then null hypothesis is accepted.

The null hypothesis and alternative hypothesis of Chi-Square Test is Independent can be expressed in two different equivalent ways.

H0: There is no impact of the Age upon the portion of saving used for stock market investment.

H1: There is impact of the Age upon the portion of saving used for stock market investment

The chi-square test is a hypothesis test that is used when needed to check if there is any relationship between two categorical variables.

**Crosstabs**

[DataSet1] C:\Users\AIT\Documents\JAYALAKSHMI_FINAL_PROJECT.sav

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
AGE * WHAT PORTION OF YOUR SAVING IS USED FOR STOCK MARKET INVESTMENT	150	94.3%	9	5.7%	159	100.0%

AGE * WHAT PORTION OF YOUR SAVING IS USED FOR STOCK MARKET INVESTMENT Crosstabulation

Count		WHAT PORTION OF YOUR SAVING IS USED FOR STOCK MARKET INVESTMENT					Total
		10%	25%	30%	40% AND ABOVE	NOT APPLICABLE	
AGE	20-30	30	9	6	5	22	71
	30-40	39	6	4	2	15	66
	40-60	2	2	2	0	7	13
Total		71	16	12	7	44	160

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	12.335 ^a	8	.137
Likelihood Ratio	13.123	8	.106
Linear-by-Linear Association	.037	1	.846
N of Valid Cases	150		

a. 6 cells (40.0%) have expected count less than 5. The minimum expected count is .61.

CORRELATIONS

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/PRINT=ONETAIL NOSIG
/STATISTICS DESCRIPTIVES
/MISSING=PAIRWISE.

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In the result of chi-square analysis, the output of p-value is 0.137 it is greater than alpha value of 0.05, here null hypothesis is accepted i.e., Age group does not affect portion of savings used for stock market investment.

FINDINGS AND CONCLUSION

It is observed that stock market investor's decision is influenced by various factors. Behavioral patterns which impact corporate investors decision-making is also been evidenced in the Indian stock market. This study attempts to analyze the most influencing factors. Among the total respondents, Majority of them were male and majority of responses are from the age group between 20 to 30 years. Many of the respondents are from the income group of above five lakh rupees. Majority of the corporate investors they came to know about stock market investment through learning and experience, most of them used very less portion of savings for stock investment. Market value of the stocks and earnings per share are the considering factor for portfolio selection. Majority are saying that investment in stock market is risky, all the different criteria's like background of the organization, history and future information, other influences, insiders information and theoretical information all of the mentioned criteria's were used for selection of stock. "High risk- High return", portfolio is suitable for many of the respondents. Most of them experienced investment of zero days or less than one year. Some of them strongly agree that they are enjoying stock investment. "Withdraw the money" is the option chosen from major corporate investors for their stock investment bad



performance.

Findings of the study have some significant implications. It shows that various influencing factors which do impact on the decision-making behavior of corporate investors. Factors such as Book-value, Market-value, and Earnings per share, Market capitalization were all impacted the perception towards investment in the stock market. This implies that individual investors are systematically differing from each other in terms of what factor influenced to do stock activity. Some investors cannot predict about their portfolios and it let them jump from one stock to another. As per the statistical data of Annova test, there is no impact of the gender upon the portfolio selected. And also; as per the chi-square statistical data, there is no impact of age group upon the portion of savings used for stock market investment.

In this study the discussion is made on important factors which are influencing investment decision of corporate investor in the stock market. The Stock market Prices reflect the investment behavior of all investors. Making a better investment decision is sometimes irrespective of market movements. One cannot avoid loss by getting into emotionally involved in the investment. Risk can be avoided with the analysis of various influencing factors of stock market. This will help to do what is right to meet financial goals including selling funds that are not performing good continuously and can switching to better funds. It is important to monitor portfolio regularly. One should not rely on single factor to make opinions about stocks. Instead look into multiple factors to make better investment decision. This study helps to fill the identified research gap and allow the financial service providers to better understand their customers financial investment behavior and investment preferences. The study is believed to be able to reflect the real investment behavior of corporate investor.

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A STUDY ON THE PATTERN OF FUNDING OF URBAN UNORGANIZED ENTERPRISES IN BENGALURU

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ABSTRACT

Unorganized enterprises are owned by individuals or households and it is involved in the production and sale of products and services. Unorganized enterprises are considered one of the major businesses that contribute to the economy indirectly through employment generation and manufacturing one-time consumable product and also contribute to gross domestic products. The problems faced by unorganized enterprises such as insufficient financial resources, arrangement of collateral securities, identifying the creditors, high interest rate and no proper document. Unorganized enterprises some time they generate capital through personal saving, friends and relatives, and also they borrow from money lenders pawn brokers and unregistered finance companies, because they provide required capital but the rate of interest is high. Because of this reason this paper is going to examine the pattern of funding followed by urban unorganized enterprises in funding their business. Descriptive method is used to collect the data. Primary data is collected in the form of a questionnaire, while secondary data is collected through articles etc., Statistical tools like Annova are used to interpret the data. The probable outcome of the study is unorganized enterprises majority of them are basically using their small saving and approaching the private finance agencies for the remaining capital. The paper is an attempt to identify the pattern followed by this unorganized enterprise to establish their enterprises and showing an inside to the problems faced by them in arranging a funds.

KEY WORDS: urban unorganized enterprises, pattern of funds, money lenders, indigenous entrepreneurs

INTRODUCTION

Unorganized enterprises are owned by individuals (or households) and which are involved in the production and sale of products and services these are based on a sole proprietorships or non-registered partnerships basis, and also contribute the economy and gross domestic product. This enterprise includes indigenous entrepreneurs, self-employed, proprietary and partnership firm traders and other services providers like tour operators, boutiques, hotels, parlors and dealer's vegetable and fruit shops etc. unorganized enterprises are use personal savings or they borrow from relatives and friends in order to raise funds. and any other sources such as creditors in trade, chit funds, unregistered finance companies. Sometimes they approach the money lenders or pawnbrokers to provide the small amount of capital that is required to be lent by them, by charging a high rate of interest which reduces the profit prospects of the unorganized enterprises. Unorganized enterprises are facing major problems such as insufficient space for expansion, arranging of collateral securities, lack of technology and skills, financial resources, raw materials, interest rate, difficulty in obtaining fund this are problems faced for enterprises.

REVIEW OF LITERATURE

Surbhi kapur and prasana sethy (2014) has observed the unorganized enterprises and has concluded in that government intervention in taking necessary steps at the legal policy for unorganized workers is required for improving their working and living condition. **Nitika diwaker and Tauffiqu Ahamad (2014)** **Nitika Diwaker and Tauffiqu Ahamad (2014)** have interpreted that unorganized enterprises are creating employment opportunities and facing some problems such as lack of skills and technology, inadequate space for expansion, credit, and infrastructure. Unorganized enterprises face some challenges, such as not being aware of government schemes and bank loan procedures, which could incur interest rates. **Anthony p. D' Souza (2013)** has interpreted that the unorganized sector contributed significantly and expanded rapidly in the economy. Self-employed people operate their own businesses with few



workers and face some problems, such as a shortage of capital for starting a new business, a lack of skills and technology, and a lack of marketing facilities. People are ready to accept a loss in unorganized businesses.

According to the study's analysis of the literature, it was discovered that no research had been done regarding developments in the unorganized enterprises. This research explains the capital mobilization process by urban unorganized enterprises in Bengaluru. With this note, the study was conducted to analyze the capital mobilization of urban unorganized enterprises. The unorganized enterprises lack various facilities like technology, updated skills, and the ability to work with very few laborers. Because of these problems, they face many losses in their business.

STATEMENT OF PROBLEM

The Unorganized enterprise are the small business enterprises established in the local residential areas who demand a very low capital. Unorganized enterprises provide employment to the local residents in turn contributing to GDP by improving the standard of living, creating wealth and providing employment continuously. Though their contribution to the economy is highly regarded they face many problems like difficulty in obtaining funds through organized lenders, high interest rates, lack of skills, unavailability of raw materials, and lack of technology. They borrow money from pawn brokers and money lenders, unregistered finance companies as they are easily approachable, provide very small quantity of fund, but charge a very high rate of interest. The main aim of this study is to determine the pattern followed by the Unorganized Enterprises in raising the required capital & to identify the problems faced by them in this process.

OBJECTIVES OF THE STUDY

- To identify sources of finance for unorganized enterprise in Bengaluru north.
- To analysis the rate of interest charged by unorganized funding market

RESEARCH DESIGN

The type of research used in is descriptive analysis. This study mainly focuses on urban unorganized sector. The primary data is collected through questionnaire, while secondary data through websites, books, articles. For the purpose of this research convenience sampling is used. The sample size for the study is 100 people from Bangalore. The tools used in this research is Anova.

HYPOTHESIS

H0: There is no significant difference between the interest rate charged by different groups of money lenders

H1: There is significant difference between the interest rate charged by different groups of money lenders

WHAT IS THE RANGE OF INTEREST CHARGED BY UNORGANIZED FUNDING AGENCIES

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
CHIT FUNDING	29	1.8276	.80485	.14946	1.5214	2.1337	1.00	3.00
MONEY LENDERS / BROKER	47	1.6383	.70481	.10281	1.4314	1.8452	1.00	3.00
INDIGENOUS BANKERS / PAWN BROKERS	13	2.2308	.83205	.23077	1.7280	2.7336	1.00	4.00
UNREGISTERED FINANCE COMPANIES	11	1.9091	1.04447	.31492	1.2074	2.6108	1.00	4.00
Total	100	1.8000	.80403	.08040	1.6405	1.9595	1.00	4.00

**ANNOVA**

WHAT IS THE RANGE OF INTEREST CHARGED BY ORGANIZED FUNDING
AGNCIES CHARGE

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	9.693	3	3.231	5.650	.001
Within Groups	54.897	96	.572		
Total	64.590	99			

CONCLUSION

P Value = 0.01

Level of significant 0.05

The p value is lesser than level of significance therefore H1 is accepted. Hence there is significant difference between the interest rate charged by different groups of money lenders

FINDINGS AND CONCLUSION

- Majority of the respondents are male and they belong to the age group ranging between 44 years.
- It is found out that most of the respondents have establish vegetable and fruit shop.
- It is found out that majority of respondents her facing challenges for funding the business
- Majority of respondents borrow money for high rate
- Unorganized enterprises fund their business through personal saving and friends and relatives
- It is found that majority of unorganized enterprise's initial investment is from Rs.100000 to Rs.200000
- Money lenders have on easy approach because of which unorganized enterprises approach them, though they offer higher interest.

Unorganized enterprises are owned by individuals, and they are involved in the production and sale of products and services. Majority of the funding comes from relatives, friends, and unorganized money lenders. They approach money lenders because they have fewer requirements and an easier approach, but they also face problems like high interest rates. According to the study, banks should educate unorganized businesses on the banking processes involved in borrowing money, as well as loan interest rates and business benefits.

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STABILIZATION OF SOIL SUBGRADE BY SODIUM LIGNOSULFONATE AND MARBLE DUST: A REVIEW

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ABSTRACT

The waste materials in the construction industry have risen exponentially., but the disposal of waste materials has become problematic in nature as it alters the environmental changes. In view of environment, Researchers started focusing on this usage of waste materials. Later, this waste materials are incorporated in soil and got succeeded in getting the effective results. This method of incorporation of materials in soil is known as soil stabilization which enriches the qualities of the soil and also enhances the engineering properties like stability, durability, permeability and compressive strength etc., which are obtained from varied laboratory tests like grain size distribution analysis, Atterberg's limits, compaction, CBR etc. This present study will give a review about the stabilization of soil with sodium lignosulphonate and marble dust (which acts as stabilizers). These stabilizing precursors are very flexible in working among clayey soils. Hence, stabilized soils can possess immense strength such that they can be used as a bind material in road constructions.

INTRODUCTION

There will be wide variety of soils at all places. Their nature and behavior cannot be predicted so easily. Some soils may suitable for road construction but some may not, also every time, soil from different places cannot be transported to desired site as in consideration of economic point of view. Soil sub-grade should possess immense strength, as it has to support the entire load coming from the top layers and also should give strength, stability, durability etc., to the above layers called sub-base, base course, surface course. Thus, it led to the soil stabilization technique. Soil stabilization is a procedure which alters the geo-technical properties of the soil by using additives like cement, fly-ash, lime etc., In economic and environment point of view, these additives are not recommended highly. Later, researchers concentrated on utilization of waste materials in construction industry like sodium lignosulfonate, marble dust, quarry dust etc., which has given effective results. Hence, soil stabilization will enhance the load bearing capacity, shear strength, drainage, permeability, compressibility etc.,

MATERIALS

SODIUM LIGNO-SULFONATE: Sodium lignosulfonate (lignosulfonic acid, sodium salt) is used in the food industry as a de-foaming agent in paper production and in adhesives for food stuffs. It has preservative properties and is used as an animal feed ingredient. It is also used in construction site, ceramics, mineral powder, the chemical industry, the textile industry (leather), the metallurgical industry, the petroleum industry, fire-retardant materials, rubber vulcanization, as well as organic polymerization. Sodium Lignosulfonate is primarily used as a cement water-reducing agent, usually causes the cement group to dissipate so that the water content is precipitated out, increasing its mobility, reducing mixing water, and saving cement.

MARBLE DUST: Marble dust is a solid waste material (by-product) generated from the processing of white marble. The ground calcium carbonate is characterized by its high brightness and chemical purity. Marble Dust is used as a natural mineral pigment or as a natural mineral filler/ texture enhancer in the preparation of casein paints or lime, whitewash, coating, stucco, and cement. It is made from calcium carbonate and is white in color and also can be used as a filler material in cement or fine aggregates when preparing concrete. Marble powder can be used as an admixture in concrete to increase the strength of the concrete.



LITERATURE REVIEW

Suresh Singh prasad et.al. (2020): In India, expansive soil covers nearly 23% of the land surface. If proper geotechnical investigation and stabilization are not performed, the problems associated with such soils will cost the project a fortune. To avoid the failure of structures such as foundations, retaining structures, slopes, lightweight structures, and pavements, it is necessary to improve swelling soil in an economical and environmentally friendly manner. The use of lignin-based organic polymer, a byproduct of the pulp industry, is a viable and sustainable technique. The current study examines the compaction, plasticity, swelling, and strength characteristics of expansive soil with additions of sodium lignosulfonate in percentages ranging from 0 to 12. The plasticity characteristics of expansive soil have been significantly improved. However, the addition of lignosulfonate results in a marginal increase in strength, which increases further with curing time.

Abhijeet Gupta et.al. (2021): Soil stabilization is the process of altering soil properties in order to increase strength and durability. Soil stabilization techniques include compaction, dewatering, and the addition of chemicals to the soil. Chemical stabilization is one of the most effective and widely used techniques, having been used successfully in the field. Lime, cement, fly ash, and rice husk are examples of chemical additives. Recently, lignin, an industrial by-product, has been identified as a chemical additive for soil mass stabilization. Furthermore, lignin has no negative environmental impact. In light of this, the current study looked into the behavior of lignin-stabilized soil. The results of unconfined compressive strength tests show that the performance of lignin-stabilized soil improves as the percentage of lignin content increases. However, it has been observed that the performance of stabilized soil decreases once the lignin content exceeds 3%. This could be because if the lignin concentration rises above 3%, the soil particles become completely coated with lignin, mobilizing strength at the surface of two lignin particles, which has a lower bonding strength than the strength mobilized at the soil lignin interface. As a result, the optimal percentage of lignosulfonate for maximum performance of stabilized soil mass should be around 3% by weight.

B.S. Sabitha et.al. (2021): The Kuttanad region of Kerala has the lowest elevation in India, at one meter above mean sea level. Because the soil in this region has a low bearing capacity, construction work on Kuttanad soil is frequently difficult and costly. Traditionally, hydrated lime, Portland cement, fly ash, and other materials have been used to stabilize Kuttanad soil. The use of industrial by-products to stabilize weak soil is becoming more popular due to the economic and environmental benefits. One such material is lignin, which is chemically known as lignosulphonates and is produced as a byproduct in the paper pulping industry. Lignin compounds come in a variety of chemical compositions depending on the cellulose separator used during the pulping process. This paper describes in detail the effectiveness of using sodium and calcium forms of lignin to stabilize Kuttanad soil. Using a series of laboratory tests, the effect of lignin on compaction characteristics, consistency limits, unconfined compressive strength, and CBR was investigated, and the optimum percentage of additive was determined. A comparison study was also conducted on the two compounds to determine which one has the best stabilization capacity.

Geethu Vijayan et.al. (2019): Soil stabilization refers to the permanent physical and chemical modification of soils in order to improve their physical properties. Stabilization can increase a soil's shear strength and/or control its shrink-swell properties, improving the load-bearing capacity of a subgrade to support pavements and foundations. Stabilization can be used to treat a variety of subgrade materials, ranging from expansive clays to granular materials. Lignosulphonate is a lignin-based polymeric stabilizer derived from the wood/paper industry as a waste byproduct. It contains both hydrophilic (sulfonate, phenyl hydroxyl, and alcoholic hydroxyl) and hydrophobic (carbon chain) groups. Lignosulfonate has shown promise as a soil stabilizing agent, particularly in soft soils. The compaction characteristics and shear strength properties were investigated in this paper.

Palsule et.al. (2018): Expansive soil's volume change behavior causes failures in structures such as embankments, retaining walls, foundations, and road subgrades. Chemical stabilization techniques are frequently used to reduce the swelling behavior of expansive soils. Traditional chemical stabilizers, such as lime and cement, are widely used and have a negative impact on the environment, either directly or indirectly during production. Many of the researchers advocated for the use of non-traditional, environmentally friendly stabilizers in soil stabilization projects. The waste product of the wood and pulp (biomass) processing industries, lignosulfonate, can be effectively used to improve the problematic behavior of expansive soil. In the current study, expansive soil is treated with varying percentages of sodium lignosulfonate powder ranging from 1% to 12%, and it is concluded that the plasticity, compaction, strength, and microstructural properties of expansive soil are improved. The poly-anionic nature of lignosulfonate causes a slight change in the MDD and OMC values for treated soils. The adsorption of lignosulfonate particles produced a waterproofing effect due to the hydrophobic carbon chain, resulting in a lower liquid limit and plasticity index. At 28 days curing, the maximum increase in unconfined compressive strength is observed for LS9, which is 1.4 times the control mix; the swelling index is also reduced from 1930 percent to 144 percent. The direct shear test in UU conditions discovered that shear parameters with increased cohesion suggested increased soil stiffness, which is supported by UCS test results. The CBR test revealed the maximum bearing value for the LS9 in soaked condition. SEM, FTIR, and XRD analysis reveal that bonds are formed between the surfaces of the clay particles and the Na-Lignosulfonate via an ion exchange process.



A.S. Mathew et.al. (2017): Marine clay is distinguished by its high organic content and as an expansive soil that shrinks and expands rapidly, causing foundation damage. Many stabilizers are used to improve the strength and other engineering properties of the material. This paper compares the modulus of elasticity in terms of E/qu with strain for marine clay stabilized with sodium lignosulfonate to cement treated clay. There was a significant increase in unconfined compressive strength for an optimum percentage of lignosulfonate (5 percent). The variation of E/qu with strain revealed that lignosulfonate-treated soil has a higher failure strain than cement-treated clay, making it less brittle. Traditional admixtures such as cement and lime have been found to cause brittleness in soil as well as toxicity to the point where vegetation on the land is affected. This problem has been solved by the use of lignosulfonate. An electrical conductivity test was performed to validate the above parameters of lignosulfonate-treated soil. It was discovered that lignosulfonate-treated soil had a decrease in electrical conductivity after 7 days of curing, whereas cement-treated soil had an increase in EC after 7 days of curing and remained the same after 28 days. This demonstrated the presence of unstable compounds in cement-treated soil, proving that lignosulfonate-treated soil is non-toxic and less brittle.

HAM Abdelkader et.al. (2021): Every day, the marble processing industry in the Shaq Al-Thouban region of East Cairo, Egypt, generates a massive amount of waste during the cutting and processing stages. Until now, the majority of these wastes have been dumped on open land, causing serious environmental issues. The amount of waste marble generated during the processing stage is approximately 20 to 25% of the total processed stone. Egypt also faces the issue of expansive soil, which occupies a large portion of its land, particularly in new cities built on these lands. The primary goal of this research is to use this waste material in soil stabilization from the standpoint of utilizing this waste as local low-cost materials and eliminating their negative environmental impacts. The waste marble dust was mixed with soil samples in various percentages of 5%, 10%, 15%, 20%, and 25% by dry weight of soil. For natural and marble dust stabilized soils, various tests such as Atterberg's limits, standard Proctor compaction, unconfined compressive strength (UCS), California bearing ratio (CBR), swelling percentage, linear shrinkage (LS) tests, and XRF and XRD analyses were performed. The soil mixtures used for UCS, CBR, and swell tests were compacted and cured for 7 days at the optimum moisture content (OMC) and maximum dry density (MDD) using the standard Proctor compaction method. The test results revealed that there are significant effects in improving the properties of expansive soils. Furthermore, the findings revealed that as the percentage of marble dust increases the plasticity index, the swelling potential of the expansive clayey soil decreases. Furthermore, the maximum dry density rises while the optimum moisture content falls. In addition, as the marble dust content increases, so do the UCS, CBR, and calcite content of the soil mixtures.

F.E Jalal et.al. (2021): Expansive/swell-shrink soils have a high plasticity and a low strength, resulting in settlement and instability of lightly loaded structures. These troublesome soils contain a variety of swelling clay minerals that are unsuitable for engineering purposes. In order to mitigate the perilous damage caused by such soils in modern geotechnical engineering, efforts are being made to use environmentally friendly and sustainable waste materials as stabilizers. The strength and consolidation characteristics of expansive soils treated with marble dust (MD) and rice husk ash (RHA) are evaluated using a battery of laboratory tests, including consistency limits, compaction, uniaxial compression strength (UCS), and consolidation tests. The effect of curing on UCS was studied from the standpoint of microstructural changes using X-ray diffraction (XRD) and scanning electron microscopy (SEM) analyses after 3, 7, 14, 28, 56, and 112 days. A series of ANN-based sensitivity analyses were also used to examine the long-term strength development of treated soils in terms of the interactive response of impacting factors. According to the results, the addition of MD and RHA decreased the water holding capacity, resulting in a reduction in soil plasticity (by 21% for MD and 14.5 percent for RHA) and optimum water content (by 2% for MD and increased by 6% for RHA), as well as an increase in the UCS (after 3 days and 112 days of curing, respectively).

Abdul waheed et.al. (2021): Collapsible soils have very high shear strength in dry conditions but rapidly lose strength when wet. Such rapid and massive strength loss causes severe distress, resulting in extensive cracking and differential settlements, instability of building foundations, and even the collapse of structures built on these soils. Waste marble dust is an industrial byproduct that is produced in large quantities around the world and poses an environmental risk. As a result, it is critical to seek a long-term solution for its disposal. The current study focused on reducing the collapse potential of CL-ML soil using a physio-chemical process. Since the soil is prone to flooding, it must be stabilized. As an admixture, different percentages of waste marble dust (WMD) were used. The optimization process used in the study revealed that adding waste marble dust improved the geotechnical parameters of collapsible soil significantly. Plasticity was reduced, but Unconfined Compressive Strength (UCS) increased significantly, and swelling was reduced to an acceptable level. The California Bearing Ratio (CBR) improves significantly as well. This study evaluates the safe disposal of hazardous waste and converts it into material suitable for engineering purposes.

Ajay Pratap et.al. (2022): The primary issue with expansive soil is that it absorbs all available moisture, resulting in excessive swelling pressure. This excessive swelling pressure causes upheaval of the structure's foundation, which is built on expansive soil strata. This study sought to use industrial waste, Marble Dust, as a stabilizing agent for expansive soil, as well as to assess the effect of Bamboo Fibre on the properties of Marble Dust stabilized expansive soil. Marble Dust was added in proportions of 10%, 20%, 30%,



and 40% by weight of soil sample, and Bamboo Fibre was mixed in proportions of 0.25 %, 0.50 %, 0.75 % and 1% by weight of soil sample in the Mix proportion of expansive soil and 30% Marble Dust.

D.B. Hamdy et.al. (2022): The primary goal of this study is to look into the possibility of using waste marble dust to stabilize collapsible soil. The marble dust addition ratios investigated in this study were 0, 5, 10, 20, and 30% by weight. Different physical and mechanical properties of soil and soil-marble dust mixture samples were investigated. According to the results of the tests, a 20% marble dust addition increased maximum dry density by 9%, decreased optimum moisture content (OMC) by 29%, increased soil cohesion by 350%, and increased friction by approximately 22%. A 5% marble dust addition resulted in a 33% improvement in California bearing ratio (CBR) values. Formulas for estimating shear strength parameters, CBR values, and compaction characteristics corresponding to MD content were developed. Furthermore, the effect of curing on soil samples containing varying amounts of marble dust was investigated. A 20% marble dust addition to samples cured for 15 days improved soil cohesion and friction by an additional 25% and 22%, respectively. Aside from the demonstrated improvement capabilities of marble dust addition to soil samples, this procedure is also economically and environmentally sustainable, as it reduces the cost of constructing structures on problematic soils and discovers new utilization areas for waste marble dust, thus reducing environmental pollution.

S. Amena et.al. (2022): Expansive soil must be treated before it can be used as a safe foundation soil for roads and buildings. The use of agricultural and industrial wastes is the best option in terms of environmental conservation and economics. The effects of using plastic waste and marble waste dust on the engineering properties of expansive soils were investigated in this study. Several laboratory tests were performed on sampled expansive soil by adding 10, 15, and 20% marble and 0.25, 0.5, and 0.75 percent 5 8 mm² plastic strips. The laboratory test results revealed that the addition of marble dust and plastic strips resulted in significant improvements in strength parameters. California Bearing Ratio (CBR) values rise as the percentages of marble dust and plastic strips increase. Unconfined compressive strength (UCS) values increase linearly with the addition of marble dust, but only up to 0.5 percent with the addition of plastic strips. The proportions of marble dust and plastic strips in the soil decrease significantly as the proportions of marble dust and plastic strips increase. This demonstrates that waste marble dust and plastic strips from environmental pollution can be used to strengthen the weak subgrade soil and reduce its swelling properties. As a result, this study discovered that expansive soil treated with polyethylene terephthalate (PET) plastic and marble dust can be used as a subgrade material because it meets the standards' minimum requirements.

SR Mahapatra et.al. (2022): Construction costs can be significantly reduced by using locally available resources for the pavement's lowermost layers. In the current urbanization and industrialization situation, several hazardous and non-hazardous wastes have formed. This promotes landfill space draining, soil contamination, and a variety of other hazardous effects; therefore, in this study, waste (i.e., rice husk ash) is used to improve soil properties. The influence of Marble dust on the quality characteristics of Rice husk ash stabilized expansive soil to increase the features of subgrade soil was determined in the current study. On specimens of native soil and expansive soil with stabilizers, Atterberg's limit, compaction, unconfined compressive strength (UCS), direct shear strength, and California bearing ratio (CBR) experiments were performed. Based on UCS tests, the optimal percentage of RHA was determined to be 10%. At a 5% increment, marble dust was added to RHA stabilized expansive soil to increase its dry weight by up to 30%. The maximum dry density (MDD) of expansive soil increases up to 25% while the optimum moisture content (OMC) decreases regardless of the percentage of marble dust added to RHA stabilized expansive soil. The UCS, direct shear strength, and soaked CBR of RHA stabilized expansive soil increased by up to 15% when marble dust was added; cohesion was clearly increased. The mixtures' UCS and CBR were 120.05 and 199.42 percent higher than the untreated soil, respectively. The addition of more marble dust had a negative impact on these properties. The results showed that expansive soil had lower values for strength parameters, but after stabilization, expansive soil had higher values for UCC, Shear Strength, and CBR. The optimal percentage of soil, rice husk ash, and marble dust for better stabilization was discovered to be 75:10:15.

CONCLUSIONS

Based on the results obtained in the present study, following conclusions are made –

- The optimum moisture content decreased with addition of sodium ligno-sulfonate and marble dust individually.
- The maximum dry density increased with addition of sodium ligno-sulfonate and granite dust separately.
- Liquid and plastic limits go on decreasing by the addition of sodium ligno-sulfonate and marble dust to the clayey soil at varying percentages separately.
- Compressive strength increases with the addition of sodium lignosulfonate and marble dust individually.
- Optimum dosage that has been obtained from the results i.e., sodium lignosulfonate is nearly 4% and marble dust is 10%.
- When compared to sodium lignosulfonate, marble dust has shown the effective results especially in case of CBR, the percentage increase is 41.18% in unsoaked CBR and 22.4% in soaked CBR.
- Hence, many researches have given the usage of sodium ligno-sulfonate and marble dust for soil stabilization. Therefore, here we have studied in this paper in combined usage of both sodium ligno-sulfonate and marble dust.



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A STUDY OF SOCIAL SKILLS OF SENIOR SECONDARY SCHOOLS STUDENTS IN RELATION TO EMOTIONAL INTELLIGENCE

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ABSTRACT

The present study was conducted with the purpose to see Influence of Social skills in relation to Emotional Intelligence among Senior Secondary School Students. The present study was conducted to a randomly selected sample of 100 Senior Secondary School Students of Sonipat District in Haryana. The tools of "Social Skills developed by Dr. Vishal Sood, Dr Arti Anand and Suresh Kumar (2012) & Emotional Intelligence developed by Dr. S.K. Mangal (1971) tools were used for the collecting of data in the present study. The data were analyzed by employing mean SD, t-test. The results of the study showed no significant difference and relation are found in the Social Skills and Emotional Intelligence of boys and girls of Senior Secondary Schools.

KEYWORDS :- Social skills , Emotional Intelligence senior secondary school students.

INTRODUCTION

Social Skills

Social Skills are learned by the brain like any other skill. Some children spontaneously pick it up; that may not be true for children with Learning Disorders. This skill involves the ability of the brain to understand social conventions. It is significantly affected in these children. They are unable to pick up environmental cues like other children of their age. They may get over-friendly with strangers, and are often unable to think of the consequences of their actions. They may not understand facial expressions. These children are deficient in assertive skills and many of them become loners as they lack the skills to mix with peers. Often, they are seen with children younger to them (they merge because of their immaturity), or elder to them (allowances are made for their inappropriate behaviour).

Emotional Intelligence

Emotional Intelligence is the ability to sense, understand and effectively apply the power and acumen of emotions as a source of human energy, information and link influence of others. The concept of emotional intelligence is a kind of umbrella term that captures a broad collection of individual skills and disposition, usually referred as soft skill or inter or intra personal skills that are outside the traditional areas of general intelligence, the technical or professional skills. According to Daniel Goleman, "Emotional Intelligence is the ability to motivate oneself and persist in the face of blocking of control stimulation and delay gratification to regulate one's mood and keep distress from swamping the ability to think, to be in tune and to hope."

This view fits well with the commonly held notion that it takes more than just brains to succeed in life. It is appropriate here to state that one should also be able to adjust by having healthy interpersonal relations with others. Salovey and Mayer coined the term 'emotional intelligence' in 1990. They described emotional intelligence as a form of social intelligence that involves the ability to monitor one's own and others' feelings and emotions, and discriminate among them and to use this information to guide one's thinking and action.



IQ may be very good predictor of scholastic achievements but not to that extent of job performance. Hunter and Hunter estimated that at best IQ account for about 25 percent of the variances. IQ is not the only factor for the success in life. It is effective at entry level but it is the social and emotional intelligence which to a greater extent affects future success than IQ.

Self-consciousness: The ability to understand one's own frame of mind, needs, drives strength and weaknesses as well as their effect on others. It also extends to person's understanding of his/her values, goodness and goals.

Self-regularization: It is the ability to control or redirect destructive impulses and moods, i.e., to think calmly before acting. This demands high degree of tolerance to other's views before considering decision.

Motivation: It is a keen desire to work for reasons beyond only calculation of money or power to pursue goals with energy and persistence. People with high motivation remain optimistic even when the score is against them. It has been found that self-motivated achiever is a person who is more successful than the one who depends on external rewards.

Empathy: It is the ability to understand the emotional make up of other and the skill in treating them in accordance with their emotions

Emotional intelligence helps in improving self valuation and communication skills, and becoming more confident learner, on the other hand, those having lack of emotional intelligence feel less connected with their college or schools and also show poor academic performance. Some children are expected to learn emotional intelligence skills implicitly from their family, schools, college or from different activities in which they live. It also involves emotional literacy that helps in reorganization of one's own feelings and of others, management of emotions.

REVIEW OF LITERATURE

Pinar Aksoy, Baran (2010) conducted a study on Review of studies aimed at bringing social skills for children in preschool period. As a result of those studies, it is found that social skill education programs are effective over skills such as assertiveness, aggressiveness, social adaptation. In this context, it is seen essential to increase studies aimed at bringing and improving social skills and to extend effective social skill education programs.

Chen Zhang, (2006) conducted a study on Social Skills intervention for students with emotional behaviour disorders: A literature review from the American perspective. The main purpose of this paper is to review literature associated with social skills training for students with behavioral difficulties in both the general and special education settings. Research findings presented in this review were based on data collected from books, research papers, and reports published from the 1970s to 2004 in the United States of America.

Guo et. Al. (2019) conducted a study for exploring the nursing student's academic procrastination and also its relationship with the emotional intelligence and self-efficacy, It was a cross-sectional survey conducted on the 347 nursing students who are recruited for the junior college at Jinan city, Shandong province of China. Findings of the study depicted that emotional intelligence and self-efficacy were having negative correlation; further self-efficacy attributed the relationship between emotional intelligence and self-efficacy. Moreover students who had low level of emotional intelligence may report high risk of academic procrastination

Bhat (2019) conducted study to examine the emotional intelligence and academic achievement of the secondary school students such as Tribal and Non-Tribal of the Kulgam district. For the present study 120 student's academic achievement marks of the 8 class were taken for investigation. Results of the study depicted that there was significant difference existed between the Tribal and Non-Tribal students emotional intelligence. Further, there was no significant difference existed between the emotional intelligence and academic achievement of the Tribal and Non-Tribal secondary school students.

JUSTIFICATION OF THE STUDY

The Present research work is focused on social skills and emotional intelligence of senior secondary school students. This study mainly intends to measure the depth of different aspects social skills and emotional intelligence and their impact on the behaviour of students. Review of related literature shows that various studies have highlighted the importance of social skills in deciding success of an individual. Good social skills give a real peace and success in life. However social behaviour may lead to different types of problems and can affect the personality and overall development of an individual. Further, the review of literature has revealed that very few studies have been undertaken in this direction. This study will be helpful in exploring the relationship between social skills and emotional intelligence preferences an individual. The findings of study help the policy makers, teachers in further planning and dealing with different emotions issues related to them.

STATEMENT OF THE PROBLEM

A study of Social skills in relation between Emotional intelligence in senior secondary school students.

**OBJECTIVE OF THE STUDY**

1. To study the Social Skills of senior secondary school students.
2. To study the Emotional intellect of senior. secondary school students.
3. To study the relationship between social skills and emotional intelligence of senior. Secondary school students.

HYPOTHESES

There is no significant difference in social skills of sec. secondary school students.

There is no significant difference in emotional intelligence of sec. secondary school.

There is significant correlation between Social Skills and emotional intelligence of sec. secondary school students.

VARIABLES OF THE STUDY

Social skills – Independent variables

Emotional intelligence – Dependent

RESEARCH METHODOLOGY

Discriptive Survey method of research will be used in the present study.

SAMPLE OF THE STUDY

In the present study of 100 senior secondary school students were selected through random sampling techniques among them 100 students were selected from 50boys,50girl senior secondary school students were selected from sample.

TOOLS TO BE USED

SSRS – VAAKS social skills by Dr Vishal Sood

EII-MM Emotional intelligence scale by Dr.S.K.Mangal

RESULTS AND DISCUSSION

Objective:- To study the social skills of senior secondary school students.

Table.1

Group	No.	Mean	SD	T Value	Level of significant
Boys	25	33.692	18.10829	0.006562	
Girls	25	318.44	27.00167		

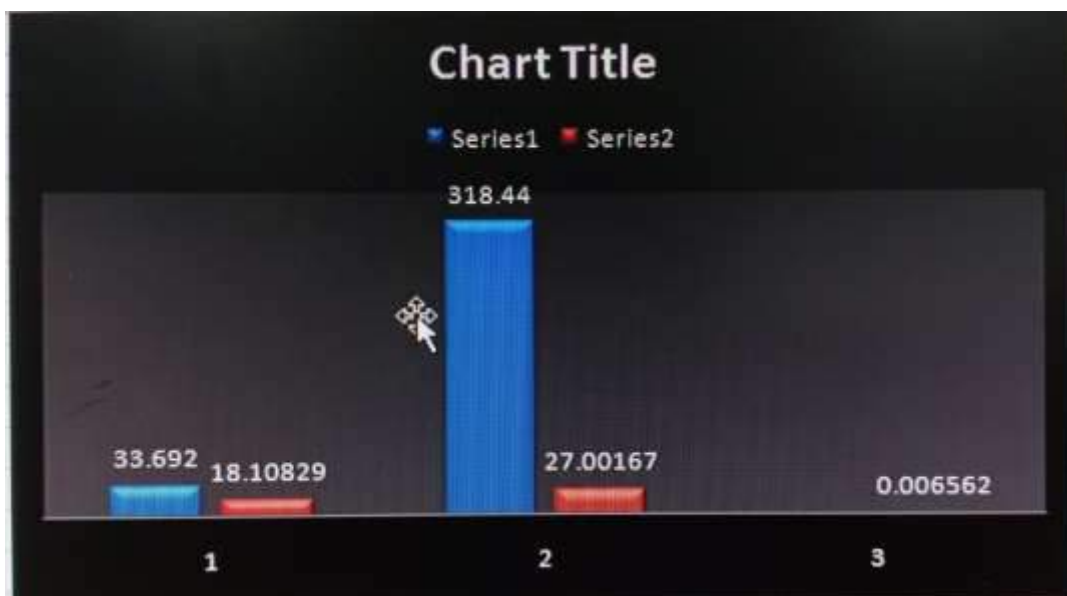


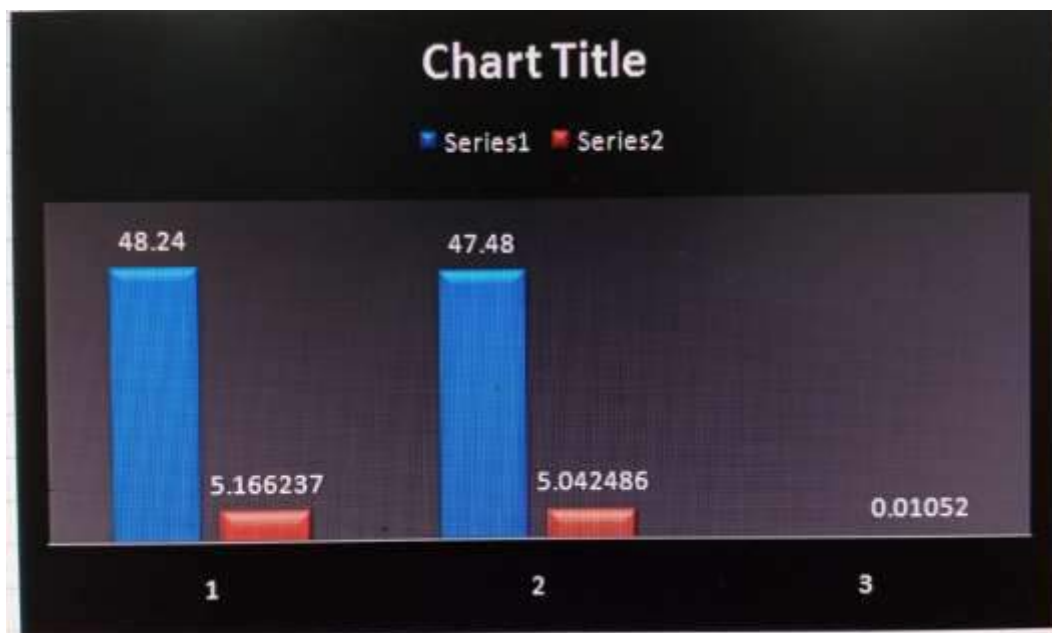


Table 1.&fig.1.showd that ,mean score of Social skills of senior secondary school students are 33.692and 318.44 respectively. The t' value comes out 0.006562 which is significant at 0 .01 levels.

Objective:- To study the emotional intelligence of the senior secondary school students

Table 2.

Group				No.	Mean	SD	T Value	Level of significant
Boys				25	48.24	5.166237	0.01052	
Girls	25	47.48	5.042486					



The table 2and fig.2 showed that, the mean score of emotional intelligence of senior secondary school students are 47.48 and 48.24 respectively.The t' value comes out to be 0.01052 which is the significant 0.01 level.There for the null hypothesis is accepted.

Objective:-3 To the relationship between social skills and emotional intelligence of senior secondary school students.

Group	No.	Mean	SD	T Value	Level of significant
Boys	25	327.68	24.59338	0.009459	
Girls	25	47.86	5.06694		



The table 3 and fig.3 showed that, the mean score of social skills and emotional intelligence senior secondary school students are 24.593338 and 327.68 respectively. The 'r-value' comes out to be 0.009459. Therefore, the null hypothesis is rejected.

STATISTICAL TECHNIQUES TO BE USED

T-test

Correlation

DELIMITATION OF THE STUDY

The present study of Sonapat District.

The present study delimitation to 100 students.

The present study is delimitation to senior secondary school students.

The present study is delimitation to 50 boys, 50 girls senior secondary school students.

MAIN FINDING

Significant difference was found between emotional intelligence of students having introverted and neurotic social skills.

It was found that there is significant and positive correlation b/w social skills and emotional intelligence among senior secondary school students.

No significant relationship was b/w social skills and emotional intelligence among senior secondary school students.

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RESULTS OF FIELD STUDIES OF THE WORKING BODY OF THE HYDROMECHANICAL SEALING DEVICE

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ANNOTATION

The article deals with the topical issue of soil compaction of layer-by-layer backfill with simultaneous locking. The results of an experimental study in laboratory and field conditions to determine the optimal density of the soil, its high-quality compaction by the hydromechanical method is given, as well as the basics of the theory of soil moistening and calculations for the required water flow for soil moistening.

KEY WORDS: Soil, soil density, water, humidity, stress, compaction, pressure, working body, nozzle, knife technology, design.

At present, soil compaction is carried out mainly by static soil-compacting machines (Fig. 1).

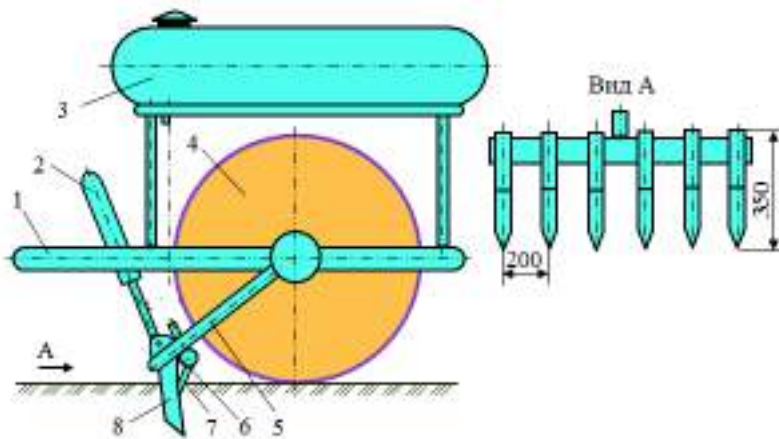
The analyzes show that the selection of soils used for hydraulic structures does not meet the requirements, bulk soil layers have not been studied, the number of passes of machines for soil compaction is multiple, they are mainly effective only in soils with optimal moisture content, soils with lower moisture content are moistened with water. The heavier it is compacted, the greater the mass of compacting machines (on average 3–4 kg per square centimeter of surface).



Rice. 1. Machines for soil compaction: *a - with a smooth roller;*
b - cam; with - on pneumatic tires



We have developed and manufactured a working model of a device for layer-by-layer soil compaction with simultaneous backfilling (Fig. 2), which reduces the number of passes and the mass of machines.



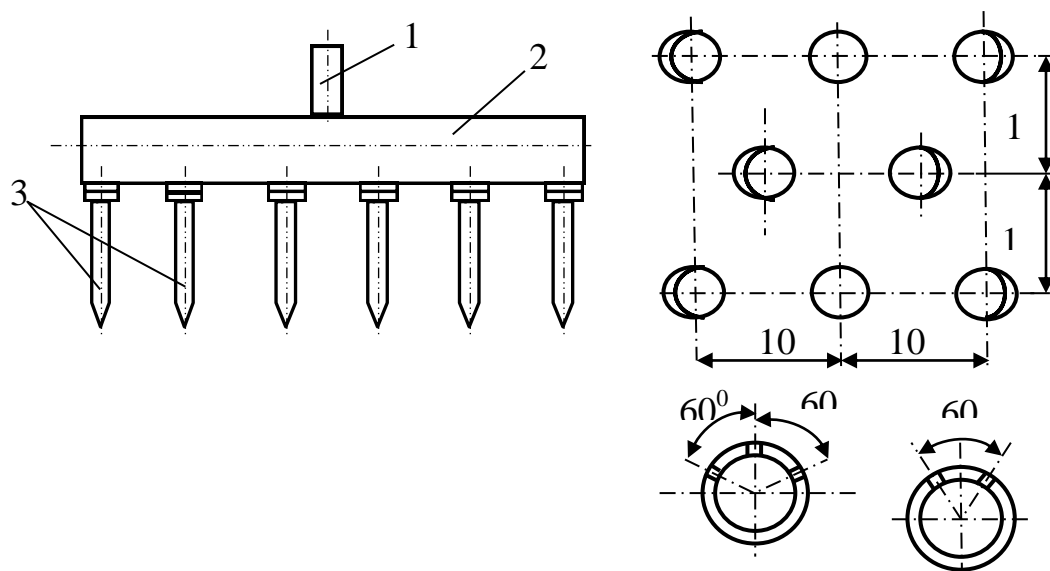
Rice. 2. Hydromechanical sealing device

The working body is attached to the base tractor through a traction frame 1, which is equipped with a pressure roller 4 for compacted soil, a hydromechanically compacted roller and a water tank 3. The moistening body consists of cutting knives 8 with a distance between them of 20 cm and a length of 35 cm and installed to each of which 7 sprinklers for spraying water. Raising and lowering the soil compactor is carried out by hydraulic cylinder 2.

Based on the results of the study, the optimal form of hydraulic (water) soil compaction was selected, as well as a device for moistening the soil by spraying water using a perforated metal pipe installed in a checkerboard pattern. In this device (Fig. 3), water is distributed from pipe 1 to pipe 2, located transversely, and transferred to perforated sprayers 3, which are installed in a checkerboard pattern.

Number of sprinklers 6...8, 14...16 holes with a diameter of 3 mm.

Sprayers are located at an angle of 120° , at an angle of 60° to each other in the direction opposite to the movement of the machine (Fig. 3).

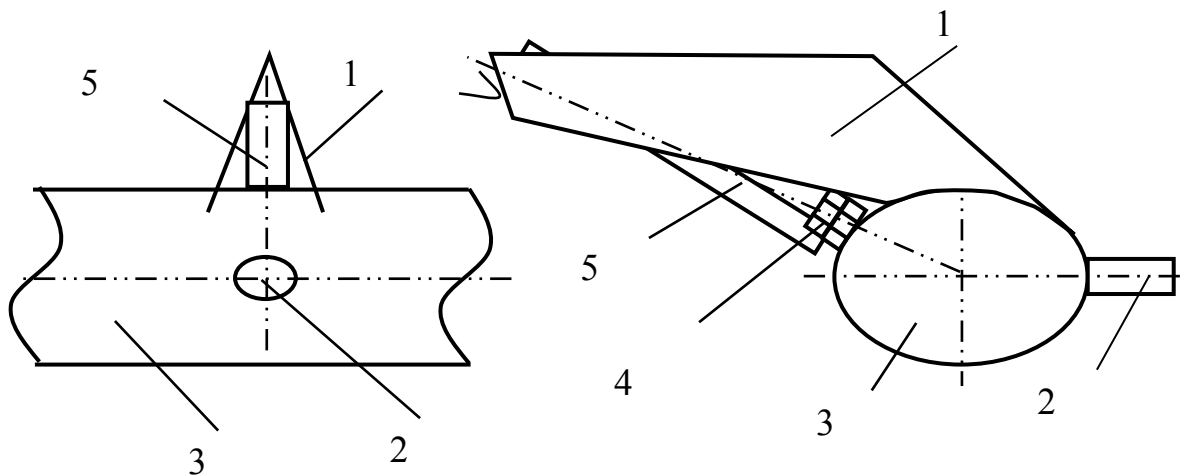


Rice. 3. Water sprayer and the location of the holes in it.

High indicators of soil density are the timely impact of soil pressure on the upper layer with the help of water, a decrease in the resistance of particles in it, a decrease in volume due to air compression in the soil.



The water tank installed in the equipment is designed to supply the water contained in it through a rubber hose to the water distributor 6. In this case, the amount of water is changed by a special device. Water is delivered to the reservoir using special water carriers.



Rice. 4. Device for cuts and locks of the soil.

The water tank in stalled on the equipment is designed to supply water from it through a rubber hose to the water distributor 6. In this case, the amount of water is changed by a special device. The cistern is supplied with water by means of special water carriers.

A drawing of the working equipment that cuts and moistens the soil is shown in Figure 4. A knife 1 is welded to the water distribution pipe 3, holes are cut in certain places of the water distribution pipe, to which a pipe with an internal thread is welded, this pipe with an internal thread is connected to the water pipe 5 through a nozzle 4, the water distribution pipe 3 is supplied with water through the water pipe 2.

The amount of water supply when moistening the soil must comply with the following conditions:

$$Q_t \leq Q_{\text{according to (1)}}$$

where: Q_t - the amount of water supplied to the soil, m^3/h ; Q_{on} - the required amount of water supplied by the supply equipment, m^3/h .

The amount of water supplied to the soil for moistening is determined by the following formula:

$$Q_T = B \cdot H \cdot \frac{W_o - W_T}{100} \cdot v_{\text{ho}} \text{ m}^3/\text{h} \quad (2)$$

where B is the width of the rink, m; H - soil layer to be soaked, m; W_o - optimal soil moisture, %; W_T - natural soil moisture, %; v_m - machine speed, m/h.

The amount of water required for the humidifying working body can be determined by the formula:

$$Q_{\text{ho}} = 1000 \cdot \mu \cdot \frac{\pi \cdot d^2}{4} \cdot n \cdot \sqrt{2 \cdot g \cdot h}, \text{ l/s} \quad (3)$$

where μ - hydraulic coefficient, taking into account the amount of water in pipes and holes; d is the diameter of the water outlets when the soil is moistened, m; h is the height of the water column in the system, m.w.s.; n is the number of holes in the system.

Using formulas (1), (2) and (3), you can determine the speed of the base machine during operation:



$$\vartheta_m = 900 \cdot \frac{\pi \cdot d^2 \cdot \mu \cdot n \cdot \sqrt{2 \cdot g \cdot h}}{B \cdot H \cdot (W_{BH} - W_e)}, \text{ m/h (4)}$$

where W_{BH} - moisture content of water-saturated soil; W_e - natural moisture content of the compacted soil.

Table 1 shows the various speeds of the roller, taking into account the supply of water to the soil to a water-saturated state.

Table 1
The speed of the roller, taking into account the supply of water to the soil to a water-saturated state.

Water supply to the ground ($W_{т\ddot{y}й} - W_{таб}$), %	Ten	13	Fifteen
Roller operating speed, m/h	255.7	196.7	170
Required mass of water for one hour of machine operation, t	12.3	9.44	8.16

For irrigation studies of the working body of the soil-compacting device, its model was made on a scale of M1: 3. Its general view is shown in Figure 5.

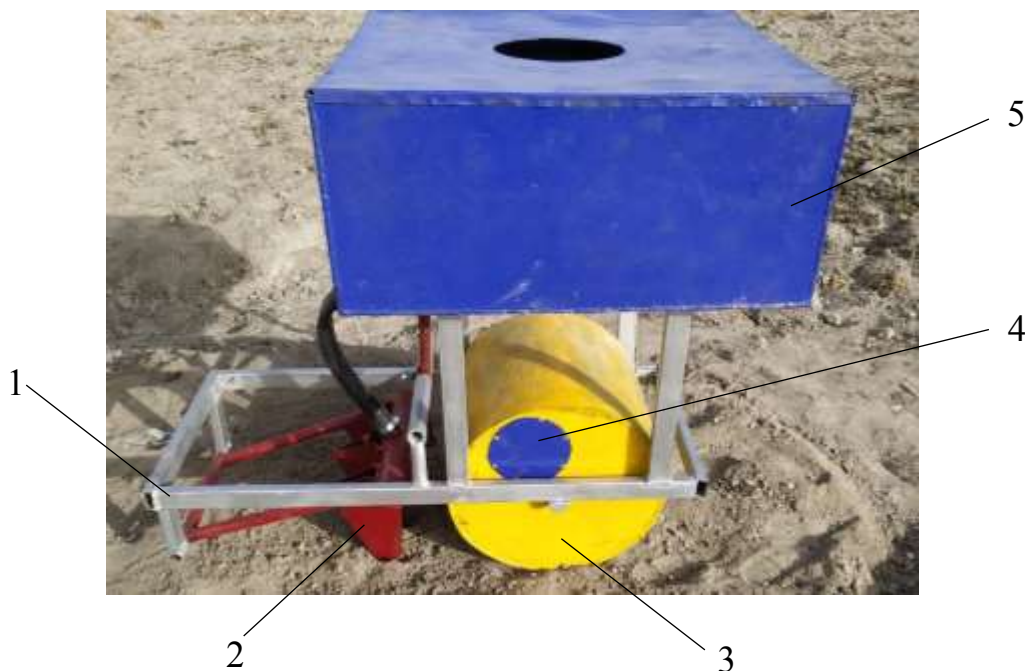


Fig.5. General view of the soil-compacting body: 1-frame; 2-moisturizing body; 3-skating rink; 4-lid; 5-capacity for water.

The results of irrigation studies are shown in Table 2.

Table 2.
Results of Irrigation Research.

Experiments	Mass of sealing body, kg	Natural soil moisture, %	Roller speed, m/coat	Water consumption for additional investment, l / s	Average density of compacted soil, g / cm ³
Ice rink test without water and sand	70	12	170	one	1.45
Testing a skating rink without water and with sand	140	12	170	one	1.50
Water and sand rink test	200	12	170	one	1.60



CONCLUSION

1. According to the research results, to ensure the optimal amount of water consumed, the following parameters of the sprayer are set: hole diameter $2 \leq d \leq 3$ (mm); number of holes $40 \leq n \leq 60$ (pcs.); water level height $1 \leq h \leq 3$ (m).

2. Based on the results of the research, an optimal design of the soil moisturizing body was developed, which provides the necessary moisture for soil compaction.

3. The checkerboard arrangement of the openings of the dampening pipes led to the formation of a high-quality compacted soil layer due to uniform soil moistening.

4. With soil moisture $W > 30\%$, its density practically does not change, with pressure on the soil $P \leq 7$ kPa and humidity $W \leq 18 \dots 22\%$, soil density $\rho \leq 1.45 \dots 1.55$ t / m³. With soil moisture $W = 22 \dots 30\%$, its density practically does not change.

5. When the proposed technology is introduced into production, along with the quality of soil compaction, labor productivity will double and metal consumption will decrease by 30%.

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USE OF FERROCHROME ASH AS REPLACEMENT CEMENT CONCRETE PAVEMENTS – A REVIEW

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ABSTRACT

Industrial wastes and by-products have been explored for many years as green construction materials. The use of some industrial wastes and by-products including ground granulated blast furnace slag, silica fume, Red mud and fly ash has already been standardized in several codes of practice as green construction materials. There is a lot of wastes from industries like fly ash, GGBS, and slag-based compounds which can be used as replacement materials for aggregates. Ferrochrome Ash (FA) is a byproduct of gas cleaning plant of Ferrochromium industry and past studies established it as a mineral admixture to cement. Due to its chemical composition, physical nature, and mechanical properties, Ferrochrome ash has recently attracted the researchers' the review article summarizes the physical, chemical, and mechanical characteristics of Ferrochromeash. It is observed from the review of literature that concrete made with industrial by-products and waste materials by partially replacing the ingredients of concrete possess superior properties as compared to conventional concrete in terms of strength, performance and durability. The particle size distribution, the chemical composition, mineralogy, microstructure of binder particles were analysed with advanced analytical techniques such as XRF, PSA, XRD, SEM/EDS. The results of this study not only suggest the effective utilization of ferrochrome ash for the synthesis of a new class of geopolymer binders but also provide a sustainable route for the management of ferrochrome waste currently generated in various countries worldwide. This paper presents an overview of the recent advances of the use of ferrochrome ash in various civil engineering applications such as road construction, and cement and concrete industries.

1. INTRODUCTION

Global annual production of ferrochrome is around 6.5–9.5 million tonnes. It is increasing at the rate of 2.8–3% per year. Accordingly the generation of ferrochrome waste is increasing parallel with the production of ferrochrome and is currently being dumped, polluting the environment without any attention towards prevention, control and remedy. Two such wastes from the Ferro alloy industry are ferrochrome ash (FA) and ferrochrome slag (FS). FS to the tune of 1–1.2 tonnes and FA of 0.02–0.03 tonnes are generated during the production of each tonne of ferrochrome product, Tribikram Mohanty (1). The greenhouse effect can be reduced by partial replacement of cement by some waste product of such as fly ash, ferrochrome ash, silica fume, red mud and GGBS etc. studied the mechanical properties and durability characteristics of concrete enhanced with ferrochrome ash (FCA) as a partial substitution for cement. investigated the performance of Ferrochrome ash (FCA) based concrete and noted that at 47% (40% FCA and 7% lime) replacement of cement produced almost same mechanical properties as ordinary concrete at 28 days of curing and concrete strength has been enhanced for later age, conducted the XRD and petrography studies of 47% (40% FA and 7% lime) replacement of cement and confirmed the results of mechanical and durability properties of their earlier studies, Monalisa Sharma (2). With an objective to use FCA in large scale, research was carried out by the authors to investigate the effect of FCA, used in various % (10-40% at an interval of 10%) with 7% lime on replacement of OPC. X-ray diffraction study of FCA was carried out using Shimadzu 6100 diffractometer with Cu-K α 1-1.54Å radiation. XRD study that FCA is rich in SiO₂ and Al₂O₃ which indicates that it can act as pozzolanic material, Prasanna (3), Most of the world's ferrochrome is produced in South Africa, Kazakhstan and India, which have large domestic chromite resources. The average chrome content in stainless steel is approximately 18%. Ferrochrome from Southern Africa, known as "chrome" and produced from a chromium containing ore with a low carbon content, is most commonly used in stainless. In the reduction of production of ordinary Portland cement, minimization of greenhouse emissions, lowering of energy consumption, management of environmental burden and conserving natural resources utilization of ferrochrome ash in concrete making will be useful, Shrinu Mohanty (14). The cement has been replaced with 10%, 20% and 30% fly ash respectively. The beam is observed with fly ash and ferrochrome ash gives more ductility than of conventional concrete. Hence 30% fly ash and 3% ferrochrome ash as partial replacement of cement has been strongly recommended, Tribikram Mohanty (11), The source mix containing 80% FCA and 20% GGBFS provided the highest



28-day compressive strength of 30.2 MPa under open-air curing conditions which is suitable for general in-situ construction works. It can be seen from that the EE requirement and ECO 2 release to the atmosphere for the FCA- and GGBFS based geopolymer concrete increases with the increase in GGBFS content in the mix. The target compressive strength of all the geopolymer mixes is less in comparison to OPC-based normal concrete except the mix F80G20. In mix F80G20, the compressive strength is 13.5% more than the OPC-based concrete with a simultaneous reduction in carbon emission and embodied energy, Jyotirmoy Mishra (8).

This review would help researchers to identify the research gaps that have to be bridged for the efficient and safe use of FCA in concrete as an Replacement of cement.

Ferrochrome ash

Due to the scarcity of land filling area, utilization of wastes in the construction sector has become an attractive proposition for disposal. Ferrochrome ash (FCA) is a waste material obtained in huge quantity from gas cleaning plant of the ferrochromium industry. The gaseous material emitted from the furnaces of smelting of alloy of iron or Ferro contains many impurities like particles of dust, improperly burned materials like timber. Due to less amount of landfilling areas dumping of industrial waste materials like ferrochrome ash have become a difficult task. A plant manufactured for the cleansing of these harmful gases is liable to process a considerable amount of particles of dust or ash which contains FCA the main constituent. Inclusion of FCA and lime has positive impact on water permeability and ultrasonic pulse velocity. The development in properties of concrete containing FCA and lime is reported significant at early age, comparable at 28 days and appreciable at later age. Ferrochrome ash and gypsum the additional benefits from this includes cost reduction, energy savings, promoting ecological balance and conservation of natural resources etc. Concrete containing ferrochrome ash FCA and gypsum powder GP is an environment friendly material. The wastes from Ferro alloy industries face disposal problems because of the residual chromium content. To date, these wastes are being land filled. The possibility of utilization of Ferrochrome slag as a coarse aggregate replacing natural coarse aggregate and FA with lime as a partial replacement for cement is explored in this research in preparation of low-cost, energy-saving, green concrete. The FCA consisted mostly of very fine and porous particles as compared to comparatively large, irregular-sized GGBFS particles.

Materials

Ordinary Portland Cement (OPC) 43 grades, Ferrochrome ash (FA), Silica fume (SF) and Red mud (RM) which are locally available in Odisha, India are used for this experimental work. Ferrochrome ash and Silica fume are available in powder forms and readily used without any further treatment. Red mud is little bit wet or content moisture when brought from aluminum industry and converted into a powder form after oven drying.

2. LITERATURE REVIEW

Tribikram Mohanty et al (2019)- The present investigation considers the combined influence on strength of concrete using various percentage fly ash and ferrochrome ash as partial replacement of cement. Experiments are carried out to get mechanical properties of ordinary Portland cement by replacement of fly ash by 10%, 20%, 30 % and 3% by ferrochrome ash. Mechanical properties are measured by determining compressive strength, split tensile strength and flexural strength. Since ferrochrome ash and fly-ash are both industrial waste. Thus the results indicated that Fly Ash 30% with 3% Ferrochrome ash may be considered when a strength requirement is more than normal. The increase in compressive strength, Split tensile strength and Flexure strength 39.45%, 49.43%, 33.33% and 2%. The optimum replacement cement use 3% and 2%, the curing period on 7, 28 and 56 days.

Monalisa Sharma et al (2021)- Ferrochrome Ash (FA) is a byproduct of gas cleaning plant of Ferrochromium industry and past studies established it as a mineral admixture to cement. The present study investigates utilization of Ferrochrome ash (FA) without addition of lime, instead supplemented with other industrial waste like Silica fume (SF) and Red mud (RM) as partial replacement of cement. The mechanical properties of the concrete is investigated considering partial replacement of Ordinary Portland Cement (OPC) by 20%, 22%, 25% and 30% with FA and other industrial waste. The observed that the design mix N80R10 and N75S15 are more economical without compromising the strength. Though concrete mix consisting with RM (N80R10) produce better compressive strength at 28 days as compared to the normal concrete (N100C) but provide marginally less flexural strength.

Prasanna K. Acharya et al (2016)- To establish FCA concrete as a structural material, its behaviour on structural concrete has been investigated. This paper investigated the flexural behaviour reinforced concrete (RC) beams containing 40% FCA and 7% lime replacing 47% OPC. The beams were tested under monolithic loading up to failure. The compressive strength of control concrete (CC) and ferrochrome ash concrete (FCAC), containing 40% FCA and 7% lime were tested at the age of 7, 14 and 28 days. The capacity of the beam, its failure and crack pattern were studied. The flexural behaviour of RC beams, containing 40% FCA and 7% lime (replacing 47% OPC) is comparable to that of normal concrete beams. The ultimate load carrying capacity of FCA concrete beams is found 8.33% more than normal concrete beams. Failure of normal concrete and FCA concrete beams occurred in tension side.

Prasanna K. Acharya et al (2016)- The study carried out to evaluate the possibility of utilization of ferrochrome ash (FCA), a waste product from ferroalloys industries for partial replacement of cement in concrete preparation. FCA is used in four different substitution rates such as 10, 20, 30 and 40% along with 7% Lime. Test results revealed that replacement of cement by FCA in



various % with 7% lime enhanced the 28 days compressive strength 1.5 - 13.5%, flexural strength 4.5 - 9%, bond strength 15 - 29%, abrasion resistance 10 - 23% and reduced the sorptivity 25 - 43%. The concrete containing 40% FCA and 7% lime, replacing 47% of ordinary Portland cement (OPC) in total, exhibited strength of normal concrete or even more at all ages. Replacement of OPC by FCA alone has negative impact on compressive strength, whereas FCA along with lime has positive impact. It can be broadly concluded from the present study that FCA along with lime is a useful raw material for partial replacement of OPC up to 47%.

Sanghamitra Jena et al (2021)- The main intention of this research is to reuse the industrial by product ferrochrome slag and silica fume as a partial replacement of natural coarse aggregate and fly ash, respectively for the production of Geopolymer concrete with improved mechanical properties. Tests for compressive strength, splitting tensile strength and flexural strength of the GPC have been carried out at 7, 28 and 90 days of curing. The scanning electron microscope (SEM) was performed for the inspection of surface texture of the microstructure of the hardened samples. This investigation aims to evaluate the study of physical and mechanical properties of GPC by partially substituting SF as binder and charge chrome as coarse aggregate. SEM, XRD and FTIR tests are conducted to study the microstructure, mineral phase and vibration characteristics of GPC. Compressive strength, splitting tensile strength and flexural strength of GPC produced by replacing 30% FS and 10% SF increases by 38.9%, 47% and 20.4%. The implementation of SF and fly ash as a blended binder combined with FS or charge chrome as partially replaced NCA in GPC. The split tensile strength and flexural strength of GPC mixes were increased up to 30% of FS with 10% SF and then it was reduced. Also, the maximum strength was achieved at 30% of FS combined with 10% SF. The reliable relationship was established between CS and STS, CS and FS. The new proposed equation was found out by regression analysis.

Prasanna K. Acharya (2015)- The study the feasibility of using FA in concrete making as partial replacement of ordinary Portland cement (OPC). OPC was replaced by FA in four different substitution rates (10%, 20%, 30% and 40%) and 7% lime. Effect of lime and FA on compressive strength, splitting tensile strength, modulus of elasticity, ultrasonic pulse velocity and water permeability was investigated. In an effort to use FA significantly, research is carried out for its utilization in concrete as partial replacement of ordinary Portland cement along with lime, without sacrificing or even improving strength and durability properties of concrete. Results of the investigation indicate technical acceptability of FA, with lime as a substitute of cement on partial replacement.

Jyotirmoy Mishra et al (2022)- Earlier studies indicated that the reactive MgO reduces shrinkage crack and porosity, and accelerates the hydration and strength development. this objective, several geopolymer mixes are prepared by varying mix proportions of FCA and FA from 20 to 80% in the source mix. The petrographic and the SEM images indicated a good bonding between the binder and aggregates phase in the resulting mix. The role of MgO, one of the primary constituents of FCA, on strength development is established through the mineralogical and FTIR analysis. XRD analysis, revealed the formation of compounds like sylvine, K-feldspar mineral, and forsterite signifying the role of, Al, Si, Ca, K, Cl, and Mg available in the FCA indicating its dissolution character that helped in the strength development of the FCA-FA based geopolymer.

Jyotirmoy Mishra et al (2022)- The paper evaluates the possibility of developing open-air cured geopolymer concrete using the mixture of two metallurgical wastes such as ferrochrome ash (FCA) as the primary and ground granulated blast furnace slag (GGBFS) as the secondary source material. It is observed that the mixture containing 80% FCA and 20% GGBFS provides a compressive strength of 30.2 MPa, suitable for general construction works. At the same time, it requires 44% less embodied energy and releases 39.28% less carbon dioxide (CO₂) gas than cement-based concrete of similar strength. The microstructural and mineralogical analysis, the presence of stable gel phases like N-A-S-H and C-A-S-H gels, and a series of rock-forming minerals were observed which were responsible for the strength development. The high chromium content in the source material is a great concern and requires further investigations for its immobilization before utilizing it as the construction material.

Prasanna K. Acharya (2016)- The possibility of using FA with lime for partial replacement of ordinary Portland cement (OPC) and FS for total replacement of natural coarse aggregates is explored in this research. The combined effect of FA with lime and FS-addition on the properties of concrete, such as workability, compressive strength, flexural strength, splitting tensile strength and sorptivity, were studied. A huge quantity of ferrochrome waste can be managed in preparation of good quality and sustainable green concrete that has ecological benefits.

Chethan Kumar B et al (2020)- This study is an attempt to develop a sustainable construction material, i.e., alkali activated slag (AAS) in combination with ferrochrome ash (FCA) as a replacement to ordinary Portland cement (OPC). The targeted design compressive strength is achieved with 25% FCA replacement 14 to GGBS in the AAS mortar system with Ms = 1.25. The test are compressive strength, split tensile strength and flexural strength, The microstructure and mineralogical studies are undertaken to ascertain the formation of different hydration products with the aid of the scanning electron microscope (SEM) and the X-ray diffractometer (XRD). Replacing 100% Ground granulated blast furnace slag (GGBS)-based AAS mortars with FCA as binder in AAS mortars resulted in reduced compressive strength. As the 5 replacement of FCA increases in the AAS mortars, N-A-S-H is observed to be predominant with 6 the co-existence of C-S-H, C-A-S-H, and gismondine. Ecological and cost analysis studies show that FCA-based AAS mortars are found to be suitable with the benefit of having lower carbon footprint, lower embodied energy, and reduced cost.

**Chemical Composition ferrochrome ash**

Material	SiO ₂ %	CaO	Al ₂ O ₃ %	Mgo%	Fe ₂ O ₃	K ₂ O%	Na ₂ %	P ₂ O ₅ %	TiO ₂ %	SO ₃	Cr ₂ O ₃ %	CL%	LOI	Reference
Ferrochrome ash (FA)	19.6	4.22	11.1	15.6	6.06	0.46	1.3	0.06	2.196	1.92	-	-	-	Tribikram Monhanty (2)
	19.6	4.22	11.1	15.6	6.06	-	-	-	-	1.92	-	-	-	Monalisa Sharma
	19.6	4.22	11.10	15.60	6.06	14.50	1.30	-	-	1.92	12.40	9.40	-	Prasana (3)
	19.6	4.22	11.10	15.60	6.06	14.50	1.30	-	-	1.92	12.40	9.40	-	Prasana (4)
	19.60	4.22	11.10	15.60	6.06	14.50	1.30	-	-	1.92	-	-	-	Prasana (5)
	19.6	4.2	11.2	15.6	6.1	14.5	1.3	-	-	-	12.40	-	-	Kumar Jyotirmoy
	19.10	3.14	10.91	23.60	7.84	11.42	2.46	0.07	N/A	-	9.892	-	-	Mishra (8)
	19.6	4.22	11.10	15.60	6.06	-	-	-	-	1.92	12.40	9.40	-	Prasana (6)
	19.6	4.22	11.1	15.6	6.06	0.46	1.3	0.06	2.196	1.92	-	-	-	

Physical properties Ferrochrome ash

Physical Properties	Specific gravity	Fineness	Colour	PH	Density (g/cm ³)	Particles retained on 45 micron sieve (wet sieving)(%)	Reference
Ferrochrome Ash(FA)	2.24	571	Grey	9.79	2.24	-	Acharya (6)
	-	571	-	-	2.24	6.50	Prasana (5)

3. MECHANICAL PROPERTIES

The effect ferrochrome ash on mechanical characteristics of the concrete samples for, compressive strength, split tensile strength and flexural strength containing natural find and coarse aggregate are reported below.

Compressive Strength

Compressive Strength is an important characteristic for determining the mechanical strength of concrete and hence necessary criteria in structural layout and detailing aspects. The average strength development of concrete cubes was studied at 7, 28 and 56 days. The test results depicted that as a consequence of the addition of Fly ash 10-30% and 3% of Ferrochrome ash, on the substitution of cement, the compressive strength got increased at all testing periods as compared to control concrete samples. The gain in strength is the consequence of the addition of FA and FCA. The presence of SiO₂ and Al₂O₃ are more in FA and FCA which is responsible for C2S and gives more strength in later age. The compressive strength of the mix with only OPC and FCA decreases by increasing the percentages of FCA, Tribikram Mohanty (11). The strength development of these two mixes N78S03 and N78S04 is found similar to or even more than (6.74 % and 5.41 %) the normal mix (N100C). RM and FA have less amount of CaO and SiO₂ than OPC but rich in Al₂O₃. The concrete prepared using FA along with SF, Red mud can replace OPC up to 30% without compromising the compressive strength, Monalisa Sharma (2). The compressive strength of concrete 40% FCA and 7% Lime. The results are summarized in Compressive strength test results revealed that ferrochrome ash concrete gained early age compressive strength 40% more than the normal concrete at the age of 7 days. At the age of 28 days, compressive strength of ferrochrome concrete is nearly 1% more than that of normal concrete, Prasanna K Acharya(3). Compressive strength got significantly increased on incorporation of ferrochrome ash FA and gypsum powder GP. At the age of 28 days, the percentage increase in compressive strength for mixes M3, M4, M5 and 1.49%, 9.28%, 22.06% respectively. Highest strength was achieved



by concrete mix M5 having 10% gypsum powder GP with 30% ferrochrome ash FA. In M3 and M4 mixes the strength decreased as compared to M5 mix containing 10% gypsum powder GP with 30% ferrochrome ash FA but the strength was more than original concrete mix. The maximum replacement of ordinary Portland cement OPC was considered 40%, Shrinu Mohanty (14)

Split Tensile Strength

The results at above age have been depicted in the results revealed that due to the inclusion of FA 10-30% and 3% FCA on replacement of cement, the split tensile strength got increase in comparison to normal concrete, Tribikram Mohanty (11). It is found that the concrete mixes N78S03 and N80R10 shows comparable results at 28 days with normal concrete mix (N100C). Compressive strength qualitatively governs the other most desired properties of concrete similar effect is observed due continued pozzolanic reaction and formation of more C-S-H gel in presence of FA with SF. The strength development in the mix, containing 19% FA and 3% Silica fume is found more with age when compared to other mixes, Monalisa Sharma(2), There was a consequent increase in split tensile strength due to incorporation of ferrochrome ash FA and gypsum powder GP. At the age of 28 days, the percentage increase in split tensile strength for all mixes M1, M2, M3, M4, M5 as compared to original concrete was found to be more. Highest strength was achieved by concrete mix containing 10% gypsum powder GP with 30% ferrochrome ash FA, Shrinu Mohanty (14). Splitting tensile strengths of all concrete mixes at the ages M1, M2, M3, M4, M5 And of 28, and 180 days. Splitting tensile strength further increased 1.45–4.58%, 1.37–5.50% and 2.71–11.04% in comparison to control mix (M-1) due to the inclusion of lime and FA. Due to the inclusion of lime and FA. Splitting tensile strength continued decreasing with higher dosages of FA, but maintained more than the control mixes at all ages, Prasanna K Acharya(5).

Flexural Strength

The flexural strength of prisms containing 10-30% of FA and 3% FCA, on replacement of cement was examined at 28 and 56 days. The results at the above age are depicted in Data obtained from the study revealed that due to the addition of FA and FCA, on the substitution of cement, the flexural strength got increased as compared to control concrete samples, Tribikram Mohanty (11). The samples N78S02, N78S03 and N78S04 the good results as compared to N100C. During the reaction the interfacial transitions zone (ITZ) among matrix and aggregate become denser and width of micro gaps decreases, which is responsible for the upgrading of strength, Monalisa Sharma (2), The flexural behaviour of RC beams, containing 40% FCA and 7% lime (replacing 47% OPC) is comparable to that of normal concrete beams. The ultimate load carrying capacity of FCA concrete beams is found 8.33% more than normal concrete beams, Prasanna (), The percentage increase in flexural strength for all mixes M1, M2, M3, M4, M5 as compared to original concrete was found to be more. Highest strength was achieved by concrete mix containing 10% gypsum powder GP with 30% ferrochrome ash FA, Shrinu Mohanty (14). Increase in flexural strength on the replacement of natural coarse aggregate by FS coarse aggregate is due to the improved mechanical properties of FS. Increase in flexural strength on the inclusion of FA and lime is due to filling of gaps and micro voids on formation of more C-S-H gel, Prasanna K Acharya (7).

Workability

The workability is controlled by particle size, shape, packing effect and surface texture of the material. It is observed from that the workability of the mix with only OPC and FA decreases on increasing percentages of FA because of the larger particle size, spherical shape and packing effect. Workability increases with the addition of RM and SF respectively in ascending order, Monalisa Sharma (2), The slump values of the control concrete with natural coarse aggregate (M-0) and control concrete with FS coarse aggregate (M-1) were recorded at 66 and 90 mm. On inclusion of various (10–40)% FA, with 7% lime in concrete mixes M-2, M-3, M-4 and M-5 containing FS coarse aggregate, the slump values were recorded as 82, 75, 68 and 57 mm, respectively. The workability increased on replacement of natural coarse aggregate by FS aggregate, but decreased on inclusion of lime and FA, Prasanna K Acharya (5)

Sorptivity

Sorptivity of the concrete mix containing FS coarse aggregate and the highest dosage of FA (M-5) is found to be less than that for the control mixes M-0 and M-1 at all ages. This is because of improved transport properties in the lime activated FA system in the formation of flocks inside the matrix due to lime hydration, Prasanna K Acharya (5).

4. CONCLUSION

- Ferrochrome ash (FCA) possesses physical and mechanical properties that are superior to different types of natural materials including limestone. Partial replacement of traditional sand with ferrochrome ash decreases the tensile splitting strength, compressive strength and flexural strength of concrete at all ages.
- As per the current research, it is visualized that samples of concrete with fly ash and ferrochrome ash Cement + Fly Ash + Ferrochrome Ash, has the maximum compressive strength.
- The increase of N-A-S-H reduces the C-S-H, C-A-S-H, and gismondine in the final composition of the ferrochrome ash (FCA) based alkali activated slag (AAS) mortars when compared with 100% GGBS-based AAS mortars.



- Ferrochrome ash supplemented with FA, SF and RM effectively replaces the cement up to 30% without compromising the compressive strength.
- The mechanical properties of Ferrochrome ash supplemented with industrial wastes like Silica fume and Red mud as partial replacement of cement in concrete.
- The compressive strength increases with the increment in the proportion of FA and Ferrochrome ash increases as partial replacement of cement.
- Higher values of co-relation coefficient confirm the strong relationship between strength and durability properties of concrete containing FA and lime.
- This investigation indicate technical acceptability of Ferrochrome ash, with lime as a substitute of cement on partial replacement.
- Finally, it is essential to update the legislations and engineering design specifications to regulate the use of ferrochrome ash in different civil engineering applications, including concrete production.

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A STUDY TO ASSESS THE KNOWLEDGE AND ATTITUDE REGARDING MENOPAUSE AMONG PERI-MENOPAUSAL WOMEN AT BANAR AND BHADVASIYA COMMUNITY HEALTH CENTERS, JODHPUR

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ABSTRACT

INTRODUCTION: Menopause, also known as the climacteric, is the time in most women's lives when menstrual periods stop permanently, and they are no longer able to bear children. Menopause typically occurs between 49 and 52 years of age. Medical professionals often define menopause as having occurred when a woman has not had any menstrual bleeding for a year. It may also be defined by a decrease in hormone production by the ovaries. In those who have had surgery to remove their uterus but still have ovaries, menopause may be considered to have occurred at the time of the surgery or when their hormone levels fell. Following the removal of the uterus, symptoms typically occur earlier, at an average of 45 years of age.

AIM OF THE STUDY: Assess knowledge and attitude regarding menopause among peri menopausal women.

MATERIAL AND METHOD: non experimental - descriptive research design study was used in order to evaluate knowledge and attitude regarding menopause among peri menopausal women of selected by non-probability purposive sampling technique in community centers Jodhpur. Each participant was informed about the study and that they could withdraw at any time and a written consent was also obtained.

RESULT: The findings showed majority of women had inadequate knowledge regarding menopause. The knowledge scores of peri-menopausal women on menopause among total numbers of sample (100), 59 (59%) sample had inadequate knowledge, 23 (23%) of sample had moderately adequate knowledge and 18 (18%) of sample had adequate knowledge regarding menopause among peri-menopausal women. However, no significant association exist between knowledge level and attitude level regarding menopause with their selected demographic variables such as Age, Marital status, Number of children, Type of family, Occupation, Age of menarche, Family history of menopausal problems.

CONCLUSION: It can be concluded that peri menopausal had inadequate knowledge as per current research recommendations. Therefore, on understanding of menopause and how it causes changes in the women's body is not only relevant to the women but also who provides health services. Menopausal health has been one of the neglected areas in our country and needs timely vital attention. The need of the hour is to conduct awareness campaigns to inform general public about menopause. The present study was undertaken to assess the knowledge and attitude regarding menopause among peri-menopausal women at Banar and Bhadvasiya Community health centers, Jodhpur.

KEY WORDS: Knowledge, Attitude, peri-menopausal women.

INTRODUCTION & BACKGROUND OF THE STUDY

Menopause officially marks the end of female reproduction. Although this life stage is well known, different stages within menopause are important to recognize and understand. Menopause itself occurs when women stop menstruating. Peri-menopause also known as the menopause transitional phase and is called such because it happens before menopause. Although they're both parts of the same overall life transition, menopause and peri-menopause have different symptoms and treatment options.

Some research appears to show that melatonin supplementation in peri-menopausal women can improve thyroid function and gonadotropin levels, as well as restore fertility and menstruation, and prevent depression associated with menopause. Peri-menopause is a natural stage of life. It is not a disease or a disorder. Therefore, it does not automatically require any kind of medical treatment. However, in those cases where the physical, mental, and emotional effects of peri-menopause are strong enough that they significantly disrupt the life of the woman experiencing them, palliative medical therapy may sometimes be appropriate.

The term "postmenopausal" describes women who have not experienced any menstrual flow for a minimum of 12 months, assuming that they have a uterus and are not pregnant or lactating. In women without a uterus, menopause or post-menopause can be identified by a blood test showing a very high FSH level. Thus post menopause is the time in a woman's life that takes place after her last period or, more accurately, after the point when her ovaries become inactive.



Menopause is one of the most significant events in a woman's life and brings in several physiological changes that affect the life of a woman permanently. Menopause is the permanent cessation of menstruation resulting in the loss of ovarian follicle development. The age at menopause appears to be genetically determined and is unaffected by race, socioeconomic status or number of prior ovulations. Factors that are toxic to the ovary often result in an earlier age of menopause; for example, women who smoke experience earlier menopause, etc. Women who have had surgery on their ovaries, or have had a hysterectomy, despite retention of their ovaries, may also experience early menopause. Besides all these effects, menopause can affect the quality of life by being a major cause of morbidity due to cardiovascular diseases and osteoporosis in postmenopausal women.

The life expectancy of the population around the world is estimated to be 75-80 years. Today, there are over 200 million menopausal women world-wide and 40 million in India. According to the WHO it is estimated that by 2025 there will be 1.1 billion women above the age of 50 years experiencing menopause and the average age of experiencing the symptoms of menopause is 47.5 years.

In India, there are no current health programs that the specific reproductive health needs of aging women. Moreover, recently launched reproductive and child health II and National Rural Health Mission only address women in the reproductive age group, ignoring those who have passed the reproductive stage. At one level, there is low awareness of the menopausal syndrome and at the other women rush into all available modes of treatment. The majority of women were not aware of therapy of menopause and fewer had heard of hormonal therapy. **In Rajasthan** the Menopause occurs at an average age of 51.4 years, the number of women aged 51 years or older is expected to be around 50 million. This number is expected to grow substantially over the next 10 years as life expectancy increases.

The above facts made the researcher realize the importance of the problem in the current situation and created the intention to carry out a study to evaluate the knowledge and attitudes about menopause among peri-menopausal women in the Banar and Bhadvasiya Community Health Center, Jodhpur.

OBJECTIVES OF THE STUDY

- To assess the knowledge of peri-menopausal women regarding menopause.
- To assess the attitude of peri-menopausal women regarding menopause.
- To determine the association between the knowledge regarding menopause and the selected demographic variables among peri-menopausal women.
- To determine the association between the attitude regarding menopause and selected demographic variables among peri-menopausal women.
- To find out the correlation between the knowledge and attitude of peri-menopausal Women regarding menopause.

HYPOTHESIS OF THE STUDY

- **H₀₁**: There is no significant relationship between knowledge and attitude regarding menopause among peri-menopausal women.
- **H₁**: There is a significant relationship between the knowledge and attitude of peri-menopausal women regarding menopause.
- **H₀₂**: There is no significant association between the knowledge regarding menopause among peri-menopausal women and with the selected demographic variables.
- **H₂**: There is a significant association between the knowledge regarding menopause among peri-menopausal women and with selected demographic variables.

OPERATIONAL DEFINITION

- **ASSESS:-** In this study assess means method of estimating the level of knowledge & attitude regarding menopause among peri-menopausal women at Banar and Bhadvasiya Community Health Center, Jodhpur through a structured questionnaire and Attitude scale.
- **KNOWLEDGE:-** In this study knowledge is the correct response of women about menopause gained in terms of scores through a structured questionnaire.
- **ATTITUDE:-** In this study attitude means beliefs, about menopause among peri-menopausal women.
- **PERI-MENOPAUSE** is the transitional time that starts before menopause and includes the 12 months that follow a women's last period.
- **MENOPAUSE:-** In this study menopause means when a woman stops having periods and is no longer able to get pregnant naturally.
- **POST-MENOPAUSE:-** In this study post-menopausal women mean the women who have not experienced periods for 12 consecutive months of amenorrhea.



- **COMMUNITY HEALTH CENTERS:-** A health care center or community health center is a network of clinics staffed by a group of general practitioners and nurses providing health care services to people in a certain area. This study consists of Banar and Bhadvasiya community health centers.

ASSUMPTION

- Peri-menopausal women may have some knowledge regarding menopause.
- The knowledge regarding menopause among peri-menopausal women may vary with selected demographic variables.

DELIMITATION

- The study will be limited to the women from Banar and Bhadvasiya Community Health Centers, Jodhpur.
- The women who are between the age of 45-60 years.
- The women who will be present at the time of study.

RESEARCH METHODOLOGY

- **RESEARCH APPROACH**
A Quantitative descriptive research approach was used in the study to assess the knowledge and attitude regarding menopause among peri-menopausal women.
- **RESEARCH DESIGN**
A descriptive survey research design was adopted for the study.

RESEARCH VARIABLE

- **Research variable:** Knowledge and Attitude regarding menopause.
- **Socio-demographic variables:** Age, Education, Marital status, number of children, Type of family Occupation, Age of menarche, Family history of menopausal problems, previous information.

POPULATION

In this study target population was those women who visited Banar and Bhadvasiya Community Health Centers, Jodhpur

SAMPLING SIZE

In this study, sampling unit chosen for the study is called sample. The sample for the study compromised of 100 peri-menopausal women.

SAMPLING TECHNIQUE

Non probability purposive sampling technique was used to select the sample of the study. Sampling proceeds on the belief that a researcher's knowledge about the population and its elements can be used to handpick the cases to be included in the sample.

RELIABILITY OF THE TOOL

The reliability of the self-structured questionnaire and attitude scale was calculated by "kunder-richardson correlation coefficient" formula. According to Kunder-Richardson Correlation Coefficient if the "r-value" is more than +0.745 then the tool is reliable.

**MAJOR FINDING OF THE STUDY**

Table 1
Frequency and percentage distribution of demographic variables among peri-menopausal women.
(N=100)

S. No	Socio-demographic variable		Frequency	Percentage
1	Age in years-	41 – 45 years	26	26
		46 – 50 years	28	28
		51 – 55 years	26	26
		Above 55 years	20	20
2	Educational qualification	No formal education	31	31
		Primary level	28	28
		Secondary level	30	30
		Graduate level	11	11
3	Marital status	Single	3	3
		Married	80	80
		Widow	14	14
		Separated	3	3
4	Number of children-	One	6	6
		Two	10	10
		Three	33	33
		More than three	51	51
5	Types of family	Nuclear	45	45
		Joint	55	55
6	Occupation-	Housewife	59	59
		Services (Government/Private)	25	25
		Self employed	9	9
		Daily wages	7	7
7	Age at menarche-	Before 10 years	4	4
		11-12	34	34
		13-14	52	52
		above 15 year	10	10
8	Family history of menopausal problems	Yes	59	59
		No	41	41
9	Previous information	Yes	19	19
		No	81	81

Table 1 Depicted that the nurse participated in the study, Age 46-50, (28%), educational qualification-No formal education (31%), marital status-married 80 (80%), number of children -more than three 51 (51%), types of family- joint 55 (55%), occupation- house wife 59 (59%), age at menarche-13-14 (52%), family history of menopausal problem No 59 (59%), previous information no 81 (81%).

Table-2
Finding related to Level of the knowledge regarding menopause among peri-menopausal women. (N=100)

S. No.	Level of Stress	Frequency	Percentage	Mean	SD
1.	Inadequate knowledge	59	59	10.87	5.86
2.	Moderately adequate knowledge	23	23		
3.	Adequate knowledge	18	18		

Table 2 depicted that the Data presented in above table showed that among total numbers of sample (100), 59 (59%) sample had inadequate knowledge, 23 (23%) of sample had moderately adequate knowledge and 18 (18%) of sample had adequate knowledge regarding menopause among peri-menopausal women with Mean score of 10.87 and S.D. score of 5.86.

**Table-3****Finding related to Level of the attitude regarding menopause among peri-menopausal women. (N=100)**

S. No.	Level of Stress	Frequency	Percentage	Mean	SD
1.	Positive attitude	19	19	38.65	15.11
2.	Neutral attitude	33	33		
3.	Negative attitude	48	48		

Table3 depicted that the Data presented in above table showed that among total numbers of sample (100), 19 (19%) sample had positive attitude, 33 (33%) of sample had Neutral attitude and 48 (48%) of sample had negative attitude regarding menopause among peri-menopausal women with Mean score of 38.65 and S.D. score of 15.11.

Table-4**Correlation between knowledge score and attitude score.**

Correlation	Mean	Median	S.D.	"r"
Knowledge scores	10.87	9.5	5.86	0.92*
Attitude score	38.65	38.5	15.11	

Table 4 depicted that the Data presented in above table showed that mean, median and standard deviation of knowledge score were 11.6, 9.5, and 6.46 respectively, while mean, median and standard deviation of attitude score were 38.65, 38.5 and 15.11. Karl Pearson's coefficient of correlation 0.92 which was significant at 0.05 level of significance. Therefore, null hypothesis was rejected and conclusion drawn that knowledge scores and attitude scores were dependent for each other.

DISCUSSION

The findings showed majority of women had inadequate knowledge regarding menopause The knowledge scores of peri-menopausal women on menopause among total numbers of sample (100), **59 (59%)** sample had inadequate knowledge, **23 (23%)** of sample had moderately adequate knowledge and **18 (18%)** of sample had adequate knowledge regarding menopause among peri-menopausal women.

The highest deficit was noted in the area meaning and basic factors. Regarding attitude **19 (19%)** sample had positive attitude, **33 (33%)** of sample had neutral attitude and **48 (48%)** of sample had negative attitude regarding menopause among peri-menopausal women. Correlation finding concluded that there is positive correlation between knowledge score and attitude score of peri-menopausal women regarding menopause. There is significant association exist between knowledge level and attitude level regarding menopause with their selected demographic variables such as educational qualification and previous information related to menopausal symptoms. However, no significant association exist between knowledge level and attitude level regarding menopause with their selected demographic variables such as Age, Marital status, Number of children, Type of family, Occupation, Age of menarche, Family history of menopausal problems.

CONCLUSION

Menopause is an extremely important yet complex period of time during which many changes occur in a women in an unpredictable way. Menopausal symptoms may become more dominant concerns for some women requiring interventions for symptom relief, especially if associated with moderate to severe distress or disruption to their roles and daily life. Menopause signals the end of a woman's ability to reproduce. Therefore, on understanding of menopause and how it causes changes in the women's body is not only relevant to the women but also who provides health services. Menopausal health has been one of the neglected areas in our country and needs timely vital attention. The need of the hour is to conduct awareness campaigns to inform general public about menopause. The present study was undertaken to assess the knowledge and attitude regarding menopause among peri-menopausal women at Banar and Bhadvasiya Community health centers, Jodhpur.

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E-GOVERNANCE IN INDIA: INITIATIVES AND CHALLENGES

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ABSTRACT

India is a nation in progress. However, it must combine the socio-economic goals with good governmental management. E-Governance originated in India during the 1970s with a focus on in-house government applications in the areas of defence, economic monitoring, planning and deployment of ICT to manage data intensive functions related to elections, census, tax administration etc. In the ICT era, nearly every country in the world used ICT in its administration, distributing necessary products and services to their citizens on time. India's government has consistently worked to deliver services to citizens in a better way. In several Indian states, there have been a number of significant projects and successful efforts. Although there are many difficulties and limitations, the government is certain that these obstacles can be removed, paving the path for the success of e-governance. This article explains the evolution of Indian e-governance, its initiatives, and its difficulties.

KEY WORDS: e-governance, ICT, Challenges, initiatives

INTRODUCTION

The “e” in e-Governance stands for ‘electronic’. Thus, e-Governance is basically associated with carrying out the functions and achieving the results of governance through the utilization of ICT (Information and Communications Technology). While Governance relates to safeguarding the legal rights of all citizens, an equally important aspect is concerned with ensuring equitable access to public services and the benefits of economic growth to all. It also ensures government to be transparent in its dealings, accountable for its activities and faster in its responses as part of good governance.

E-Governance is in essence, the application of Information and communications technology to government functioning in order to create ‘Simple, Moral, Accountable, Responsive and transparent’ (SMART) governance. E-Governance refers to the use by government agencies of Information Technologies (such as Wide Area Networks, the Internet and mobile computing) that have the ability to transform relations with citizens, businesses, and various arms of government resulting in better delivery of government services to citizens, improved interactions with business and industry, citizen empowerment through access to information, or more efficient government management. The resultant benefits are less corruption, increased transparency, greater convenience, revenue growth, and cost reductions (World Bank).

Dawes (2009), e-governance as ‘E-governance comprises the use of information and communication, technologies to support public services, government administration, democratic processes, and relationships among citizens, civil society, the private sector and the state’. Sanjay Kumar Dwivedi & Ajay Kumar Bharti (2010), the challenges faced by the government and public sector organizations all over the world in the administration of E-Governance and to making it efficient and cost effective. Effective use of Information, Communication and technology (ICT) for e-governance for providing proper services to citizen has also been studied. Findings of their research are that E-Governance has been considered as a high priority agenda in India and it was also found out that E-governance is good governance.

OBJECTIVES OF THE STUDY

1. To provide an overview and initiatives taken in e-governance in india
2. To examine the major challenges of e-governance in India



METHODOLOGY

Secondary data is used to collect the information related to the study. Various Indian Government websites and researches done in this area have been used to collect the data related to E-Governance

RESULT AND DISCUSSION

1. Overview of e-Governance in India

e- Governance began in India in the 1970s with a concentration on internal government applications for planning, economic monitoring, defence, and the use of ICT to handle data-intensive tasks for elections, censuses, and tax administration. Initial steps taken The Department of Electronics' establishment in 1970 was India's first major move toward e-governance since it focused attention on "information" and its conveyance. The District Information System initiative was started by the National Informatics Center (NIC), which was founded in 1977, in order to computerise all district offices across the nation. The establishment of NICNET, a national satellite-based computer network, in 1987 gave e-governance its primary impetus.

The Eleventh Plan for e-governance had explored a spectrum of subjects. These comprised 27 areas for the implementation of e-technology and reforms, as well as changes to the Ministry of Corporate Affairs. The Department of Customs has had extremely favourable prior experience with reservations on the railways and refunding customs duty. 60,000 common service centres will be operational by the end of the Eleventh Plan to supply public services across the nation. The optical fibre network will be expanded, and broadband access will be extended to all Panchayat levels, according to new plans. The public would benefit from having access to all e-mode services offered at the grassroots levels due to this.

Major Initiatives Taken for e-Governance in India

Table -1 Initiative for e-Governance

1	Andhra Pradesh (AP): e-Seva, CARD, VOICE, MPHS, FAST, e- Cops, Saukaryam, Online transaction processing, e-immunization Rural Health Call Center and Site Suitability for Water Harvesting, Professional e-Pension.
2	Arunachal Pradesh -Community Information Center.
3	Bihar- E- Sale Tax
4	Chattisgarh- Chhattisgarh Info-Tech Promotion Society, Treasury Office, E-Linking Project
5	Delhi - Automatic Vehicle Tracking System, Computerisation Of Website Of RCS Office, Electronic Clearance System, Management Information System.
6	Goa- Dharani Project
7	Gujarat - Mahiti Shakti, Request For Government Documents Online, Form Book Online, G R Book Online, Census Online, Tender Notice.
8	Haryana -Nai Disha
9	Himachal Pradesh - Lok Mitra
10	Karnataka - Bhoomi, Khajane, Kaveri
11	Kerala - E-Srinkhala, Rdnet, Fast, Reliable, Instant, Friends
12	Madhya Pradesh - Gyandoot, Gram Sampark, Smart Card In Transport , department,Computerization MP State Agricultural Marketing Board (Mandi Board), E-Choupal Etc
13	Maharashtra - Setu, Online Complaint Management System—Mumbai
14	Punjab - Suvidha, Tisp, Eems, Pawan
15	Rajasthan- Jan Mitra, Rajswift, Lokmitra, Rajnidhi
16	Tamil Nadu -Sari
17	Uttar Pradesh- Lokvani , E-suvidha , E-Seva , Koshvani , JAN SUVIDHA KENDRA, Srishti, Bhulekh,

- A self-sustaining e-Government initiative called "**Bhoomi**" will electronically provide 20 million rural land records to 6.7 million farmers in Karnataka.
- **KHAJANE:** A Government-to-Government (G2G) e-Governance programme that automates the whole Government Treasury System Its implementation was primarily motivated by the need to handle state funds effectively and get rid of structural flaws in the manual treasury system in Karnataka.
 - **e-Seva** (Intended to offer services from "Government to Citizen" and "e- Business to Citizen"). By connecting customers and residents to the appropriate government agencies and giving online information at the moment of service delivery, all services are supplied to them online. The concept has gained a lot of support from the populace, particularly for the payment of utility bills in Andhra Pradesh.



- The Department of Information Technology launched the **e-District**. The MMP seeks to provide large volume, citizen-focused services at the District level, such as the issuance of birth/death certificates, income and caste certificates, old age and widow pensions, etc.
- The Department of Administrative Reforms & Public Grievances launched the **e-Office**. By switching to a "Less Paper Office," the MMP seeks to greatly increase the government's operational effectiveness.
- The Department of Justice, Ministry of Law, and Justice introduced **e-courts**. The Mission Mode Project (MMP) attempts to use technology for better delivery of court services to the public.

1. Major challenges of e-governance in India

- Trust:** These are the important developments with e-governance. All user and government trust can be defined. The former indicates that users of any type of software or technologies must feel confident, at ease, and trusting of it. Another vital element relates to public trust in the government. Citizens nowadays who use e-governance services generally have some faith in its advances. Additionally, there may be certain dishonest operations carried out by any other organization for the purpose of money, important information, or even personal information, etc. Additionally, important departmental information is occasionally overlooked or left out of government offices, which seriously undermines individuals of all economic classes' confidence in e-governance.
- Infrastructure:** It is basically required for India to implement e-governance as much as possible. Electricity, internet access, and a lack of technology adaptability will impede the development of e-governance. To enhance e-governance in developing nations, there will be enough basic facilities accessible.
- Cost:** One of the biggest obstacles to the introduction of e-governance is cost, particularly in developing nations like India where the majority of people lives in poverty. Politicians and elected officials don't take any interest in establishing e-governance into existence.
- Security and privacy:** The government should implement appropriate measures to protect citizens' private and confidential information.
- Population:** Because India has a large population, implementing e-government is challenging. However, the government's efforts to provide residents with unique identification have minimized this impediment.

CONCLUSION

In India, e-Governance is getting popular, but challenges like public awareness and the digital barrier must be addressed. High-speed internet access is crucial for the delivery of e-Governance initiatives, and the upcoming nationwide rollout of 5G technology will enhance our commitment. Even though the Indian government spends a lot of money on e-Governance programs, not all of India benefits from them. The key issues that have prevented the successful adoption of e-Governance in India are lack of awareness among the population, the local language of that people in a particular area, privacy concerns regarding the personal information of the populace, etc. The development of e-Governance in India can greatly benefit from public participation.

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TRAINING OF EXPERT PERSONNEL IN THE FIELD OF IRRIGATION IN UZBEKISTAN (1951-1990)

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ABSTRACT

The article reveals the training of specialists in the field of irrigation in Uzbekistan in 1950-1990 at the Tashkent Institute of Irrigation and Agricultural Mechanization Engineers and their contribution to the development of irrigation and agriculture with the help of primary sources. In addition, it was analyzed that the leading positions in the Ministry of Water Resources were occupied by representatives of other nationalities.

KEY WORDS: *Uzbekistan, soviet government, irrigation, land reclamation, specialist, virgin lands, cotton monopoly.*

INTRODUCTION

Uzbekistan is considered to be a region with a unique professional experience in the traditions of farming culture in the Central Asian region, and during the Soviet rule, the republic was further improved as a base school for the fields of irrigation and melioration. The Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, founded in 1934 (now the National Research University "Tashkent Institute of Irrigation and Agricultural Mechanization Engineers"), has played the role of this center for several decades. Highly educated irrigator personnel were also trained at the hydromelioration faculties of the Samarkand Agriculture and Andizhan Cotton Growing Institutes (now the Andizhan Institute of Agriculture and Agrotechnologies). At the same time, the Soviet government also attached great importance to the system of training personnel with secondary special education. However, management positions in water management agencies were also filled with personnel from other nationalities who were unfamiliar with local conditions and farming culture.

RESEARCH METHODS

The Soviet authorities made several decisions on the training of water management personnel. In particular, on May 12, 1951, the decision of the USSR Council of Ministers "On expanding the training of technicians of hydraulic specialties" was adopted. This decision was developed based on the decision of the Council of Ministers of the USSR dated March 1, 1951 "On expanding the training of engineers and technicians in hydraulic specialties" [1.p.1]. According to him, a number of tasks were assigned to the Ministry of Cotton. For example, from the 1951-1952 academic year, the Samarkand agricultural technical school was reorganized as a hydromelioration technical school, and 90 people were admitted per year, and this technical school was included in the Ministry of Water Management of the UzSSR, as well as four new academic years in Andizhan, Namangan and Bukhara agricultural technical schools. organization of annual educational hydromelioration departments (it is planned to receive and train 240 students out of 80 students in all three regional technical schools in this academic year).

RESULTS AND DISCUSSIONS

Allowing the ministries, departments and organizations of the UZSSR to allow students admitted to the two-year hydromelioration and hydrotechnical departments of technical schools to study without being separated from production, and students admitted to Andizhan, Namangan, Bukhara, Samarkand and Khorezm regional executive committees for the new academic year by August 1, 1951 It was proposed to provide Andizhan, Namangan and Bukhara agricultural technical schools with 100 beds, Samarkand hydromelioration technical school with 90 beds, Khorezm hydromelioration technical school with 150 beds [1.p.2].



At the beginning of 1952, the total number of workers and engineer-technical employees of the Ferghana Valley water utilities and the “Ferghanavodstroy” trust was 2,188, and in 1958, it was 3,011. In 1970, this indicator equaled 4,899 people in the “Andizhanvodstroy” and “Ferghanavodstroy” trusts, of which 1,301 were excavator drivers and their assistants, 531 were scrapers, 546 were bulldozers, 231 were graders, 163 were tractor drivers, and 931 were concrete workers. But by the beginning of 1972, “Ferghanavodstroy” alone lacked 46 excavators, 182 scraper-bulldozers, 108 construction workers and other mastering specialists [3.p.69].

On June 24 of this year, the order of the Ministry of Water Management of the UZSSR “On measures to further improve the selection, training and placement of personnel in the Ministry of Water Management of the UZSSR and its local organizations” noted the following views on the work of personnel: “Until now, 75% Engineers, 74 hydrotechnics of the section have been working without professional knowledge, 41% of heads of irrigation system departments, 74% of district water management heads, 30% of chief engineers of irrigation system departments worked in engineering positions with lower professional education. A number of engineering positions in the ministry’s apparatus were filled with non-specialized personnel. The training of personnel from local nationalities in the Ministry and its territorial bodies was not well established. However, Uzbeks made up 2% of the total composition in the ministerial apparatus, 3% in water management of Bukhara region, and 6% in Samarkand” [4.p.16].

According to the data, during the Soviet era, the members of the Ministry of Water Management were a minority of the local people. At the same time, in the above order, a number of deficiencies in improving the qualifications of water management personnel were also noted: “The personnel department, heads of departments, departments of ministries and heads of regional water management departments did not deal at all with the issue of creating a reserve for nominating candidates for management work. Activities for improvement of practical (job-related) qualification of employees have not been organized. For this reason, there are 329 unfilled positions in the ministry apparatus and its local bodies, of which 32 are managers and 297 are specialists” [4.p.15].

On August 16, 1952, a special decree of the Ministry of Water Management of the UZSSR “On further improvement of the quality of personnel training for water management bodies” [5.p.90] was issued. In it, it was agreed to allow the water management agencies of the republic to increase the number of students in the two-year education by 30 people per academic year and, accordingly, to reduce the number of students in the four-year department by 30 people. In the 1952-1953 academic year, a total of 718 students studied at the Tashkent hydromelioration technical school under the Ministry of Water Management, including 230 students at the 1st stage, 158 at the 2nd stage, 200 at the 3rd stage, and 130 at the 4th stage [6.p.11].

Soviet authorities sent personnel from the center in order to fill the local water management agencies with personnel. In particular, “In 1953-1954, 107 people from graduates of higher educational institutions and technical schools, including 37 people from Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, 13 people from the Moscow Institute of Water Management, 9 people from the Kyiv Hydromelioration Institute, as well as Leningrad, Saratov, Omsk, Yerevan, Rostov, were involved in the construction of Central Ferghana. and young professionals came from other cities” [7.p.11]. According to the information, the personnel sent from other republics were not aware of the natural conditions. Because of this, there were many problems in the cultivation of agricultural products for the needs of the local population.

On October 31, 1955, the order of the Ministry of Water Management of the UzSSR “On working with personnel in the system of the Ministry of Water Management of the UzSSR” was published [8.p.41]. It evaluated the activities of the ministry in terms of personnel training. In particular, the ministry has not fully implemented the restructuring of personnel selection, placement, and training. Some positions of the ministry’s offices remained vacant, they lacked personnel. As mentioned above, during the Soviet rule, most of the management positions of the irrigation system were occupied by personnel belonging to other nationalities. This aspect was also clearly visible in the number of students in technical schools, which are secondary educational institutions. In particular, 1056 (42.0%) of 2483 students in technical schools were representatives of the local population, and 7 of them were Uzbek girls. Due to the lack of classrooms in some technical schools, training sessions were conducted in two shifts, due to the lack of dormitories, 1,700 students were accommodated in private apartments [8.p.44].

Training of personnel with higher education and scientific potential for the water industry network was launched at the Tashkent Institute of Irrigation and Agricultural Mechanization Engineers. Including, Tashkent Institute of Irrigation and Agricultural Mechanization Engineers trained many engineers and scientists from Asian, African and Latin American countries. This work was started in 1956. Representatives of Mongolia, Cuba, Vietnam, Egypt, Afghanistan, Ghana, Mali, Somalia, Kenya, Nigeria, Syria, Uganda, Yemen, Tanzania and other countries studied here, graduated from post-graduate studies and received scientific degrees. 289 specialists were delivered to 36 countries of the world in 7 years [9.p.25].

The Soviet authorities also emphasized the system of training irrigation personnel in the Ferghana Valley. In 1956, the number of highly educated specialists working in the irrigation system of Ferghana region was 485. In order to further develop the cotton industry, secondary special educational institutions were also established in the occupied desert areas. In particular, 7 agricultural mechanization schools and 2 state agricultural technical schools were opened in Mirzachul during 1956-1966. As of January 1, 1966, about 3,000 people studied in these technical schools. These educational institutions trained mechanist, technician-builder and small agronomist cadres for farms to be established in the newly irrigated zone [10.p.63].



Four reclamation technical schools in the republic have trained middle-level specialists - irrigators for the irrigation system. In addition, other republics of the Union have trained irrigator specialists for the water management of Uzbekistan. In 1958, 6,000 specialists, including 2,000 engineers and 4,000 technicians, worked in the irrigation of Uzbekistan [11.p.9].

In 1961, the total number of mechanized personnel in state and collective farms was 71 thousand, by 1965 they were 98.9 thousand, and in 1967 they were 108.9 thousand. In 1961, the total number of specialists with higher and secondary specialized education sent to project organizations was 69. Although the decision of the party-government adopted in 1963 on the development of the Karshi desert as a priority, it was indicated to "take care" of those displaced to the desert, but these tasks were not fulfilled in time [12.p.66]. As a result, the lack of personnel in this area has become more intense. The Soviet government reacted brutally to this situation. In 1969, in order to prevent dissatisfaction, a special law of the government was adopted, in which the following was determined in order to ensure the permanent stay of young specialists sent to conservation farms after graduating from a vocational school:

First of all, if a young professional who has graduated from a special educational institution quits his job at his own will, he must return all the expenses spent on training him in a vocational and technical educational institution to the farm or special educational institution.

Secondly, the following words should be written in the labor book of the person who was dismissed in this way, that is, "he was dismissed by his own will, but without the consent of the administration and public organizations."

Thirdly, when re-employing a young worker with the above-mentioned employment record, the company that employs him must pay the entire cost of training him in a special educational institution to the company where he previously worked from his personal income [13.p.20].

It is clear from these colonial arrangements that the young professionals sent to the protected lands had great difficulties in finding other jobs if they could not adapt to the living conditions. However, despite this, the number of personnel working in the Karshi Desert did not decrease significantly. Because Karshi Polytechnic has become a real source of training of specialists and middle managers. It has trained more than 3,000 young professionals to work on construction sites. "Karshistroy" employed 1,520 highly educated and about 1,400 specialists with secondary specialized education. A shortage of personnel was observed in Boz district irrigation organizations in Central Ferghana region. There was a lack of specialist hydraulic technicians, engineers, and plumbers in the district water industry. In 1965, 64 employees worked in Boz district water industry alone, but most of them were not suitable for their current positions. There were 32 such employees. Therefore, the district executive committee asked the regional governing bodies to assist in sending the graduates of the hydromelioration school to Boz [14.p.68].

The decision of the Council of Ministers of the UZSSR and the Central Committee of the UzCP of May 11, 1966 and December 31, 1966 "On further improving the efficiency of the system of improving the qualifications of agricultural specialists and leading personnel of collective and state farms" performed moderately by the heads of trusts and collective farms [15.p.11].

At the same time, the retraining of senior staff and specialists was not well established in 1966-1967 and 1967-1968 academic years. As a result of this, training in the department of retraining of managerial personnel at the Tashkent Institute of Agriculture was delayed for two weeks. The facts show that there were also cases of forced return of specialists who went for training. Instead of 75 zootechnicians-poachers, only 45 people studied at the faculty of Samarkand Agricultural Institute. Instead of the planned 45, 35 engineers-hydraulic and mechanical specialists were trained at the faculty of Tashkent Institute of Irrigation and Agricultural Mechanization Engineers.

For two years, 152 instead of 180 trainees studied at the training department of the Faculty of Higher Education at the Tashkent Agricultural Institute, 180 instead of 288 at the Faculty of Agricultural Specialists of Samarkand Agricultural Institute, and 73 trainees instead of 96 at Tashkent Institute of Irrigation and Agricultural Mechanization Engineers. In 1970, 8282 students studied at Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, this figure was 2367 more than in 1965 [16.p.326]. Specialists who graduated from the institute were engaged in solving the important problems of irrigation, complex mechanization of cotton growing, raising of farming culture.

In order to regularly supply the Union with cotton, the Soviet authorities paid great attention to the system of training middle-level agricultural and water management personnel. Because of this, their number increased. In the ninth five-year period (1971-1975), 6 hydromelioration technical schools trained water management personnel with secondary special education. In particular, Tashkent, Samarkand, Andizhan, Urganch, Surkhondarya and Nukus hydromelioration educational institutions have been operating. These educational institutions trained 8,496 specialists in hydromelioration, hydrotechnical construction, mechanization of hydromelioration works, and automatic operation of the water management system. It can be said that they continued to grow. In particular, in 1971 - 1349, in 1972 - 1558, in 1973 - 1981, in 1974 - 1790 and in 1975 - 1818 young specialists with secondary technical education were trained. In this five-year period, the number of engineers and technicians of the Ministry of Water Management of the UzSSR with higher education also increased. Their number was 2164 in 1971, 2368 in 1972, 3337 in 1973, 4941 in 1974, and 6139 in 1975. During five years, 5487 specialists from higher educational institutions were sent to water management organizations [17.p.321].

It is clear from the given information that in accordance with the agrarian policy of the center in the field of cotton growing, the number of technical personnel training in the field of irrigation in the republic gradually increased from year to year. However, the lack of personnel in the field of irrigation and melioration was noticed in some areas. It is worth noting that the lack of qualified specialists (especially in the newly developed lands) was considered a serious problem. The authorities and the heads



of most agricultural enterprises were not engaged in creating conditions for specialists to stay at work. Young professionals who graduated from universities and technical schools and were sent to villages were not provided with enough housing, they often did not work in their specialty [18.p.553].

In many irrigation departments of the republic, highly educated specialists were particularly lacking. However, since the establishment of the “Ferghanavodstroy” trust, 1,028 specialists with higher education and 1,372 specialists with secondary special education have been sent to it. A rapid turnover of personnel was observed in the trust systems. For example, in 1972, 1,896 people were hired at Ferghanavodstroy, 966 of them left, and the same number were re-employed.

Mechanizers and irrigators were very necessary for the use of technical devices, equipment and mechanisms in the water management system. In particular, in 1972, there were 187,800 specialists in various professions in collective and state farms of Ferghana Valley, 7,930 of them were agronomists, zootechnicians, irrigators and other personnel. Including, there were 1,258,000 specialists with special secondary education. In 1973, mechanics made up 13% of the employees of collective farms in the republic, and their ranks expanded considerably. However, in the 1980s, the number of mechanized personnel decreased. For example, in 1980, the number of mechanics was 120.1 thousand, in 1985 it was 121.1 thousand, and in 1990 it was 70.3 thousand [19.p.29].

During this period, Andizhan Hydromelioration Technical College trained personnel in the specialties “Hydromelioration”, “Hydrotechnical construction”, “Mechanization of hydromelioration works”. According to the tariff notice dated April 15, 1974, 73 teachers in the technical school, 57 of them were full-time teachers, 16 worked on a substitute basis [20.p.113]. In the academic year of 1973-1974, there were 1,455 students of the Andizhan hydromelioration technical school, most of whom were hydromelioration students. studied in the specialty.

According to the 1976 state table approved by the Ministry of Reclamation and Water Management of the UZSSR, Andijan Regional Irrigation System Department was filled with specialist personnel. As of January 1, 1977, 2460 people worked in the regional irrigation system. Among them, 1056 engineers and technicians, of which 130 have a higher education, and 467 have a secondary education. At the same time, 12 of the workers who worked in the water industry studied in part-time departments of higher educational institutions, and 28 in technical schools. In 1976, 14 engineers-technicians advanced their qualifications [21.p.21].

According to the decision of the Central Committee of the Republic of Uzbekistan dated September 11, 1974 “On the activities of agricultural organizations on the improvement and retraining of leading personnel and team, state economy specialists”, taking measures to improve educational and methodological work, apply advanced innovations, Tashkent irrigation and was entrusted to the rector of the Institute of Agricultural Mechanization Engineers. Also, to develop the schedule of sending to the Ministry of Agriculture of the SSR, regional agricultural departments for training in 1976-1980 according to the established plan, to send those who have a higher education in agriculture and have at least 5 years of work experience after graduation, to train 250 places in the institute was assigned the task of building educational facilities for students of the faculty. On January 21, 1976, the collegium of the Ministry of Agriculture of the UZSSR adopted a decision on the implementation of this decision by the faculty of training under the Tashkent Institute of Irrigation and Agricultural Mechanization Engineers and agricultural organizations. It is noted that 3,325 agricultural and water management managers and specialists have been trained since the establishment of the training faculty at the institute. In the ninth five-year period alone, 2,227 specialists were educated. Instead of 420 students in the 1974-1975 school year plan, 424 people were trained [22.p.215].

At the Institute of Irrigation and Agricultural Mechanization Engineers in Tashkent, the system of training specialists was further formed in the tenth five-year period. For example, “In this five years, 14,500 students (9,000 of them in the full-time department) studied in 18 faculties in its 3 branches. They were trained in 14 specialties and various technical and economic specializations. The institute's annual enrollment reached 3,740, with 1,980 engineers graduating annually (of which more than 1,500 were contributed by full-time departments). In the years of its activity, the institute trained more than 28,000 specialists for the national economy, including 7,350 specialists in the tenth five-year period” [23.p.56-58].

In 1979 itself, 644 engineering and technical employees of “Karshistroy” improved their skills in short-term courses and seminars. 3,500 skilled workers were trained without separation from production, 239 people occupied occupations close to each other. However, during this period, the number of mechanists working permanently in the state farms of the Karshi Desert was decreasing year by year. For example, in the 11th state farm named after the 50th anniversary of the USSR in the Nishan region, 48 people who graduated from agricultural technical schools came in 1979-1982, and during this period, 46 young mechanics left their jobs voluntarily. In such conditions, it is difficult to hope that skilled mechanized personnel will be permanently employed in the state farms of the Karshi desert [24.p.20].

In the 11th five-year period, mechanics made up 63.4%, land reclamation workers 14.2%, cattle breeders 13.4%. Their training was carried out in permanent courses organized in 212 vocational and technical educational institutions. In Andizhan region alone, in 1987, at the request of the regional water management department, the Ministry of Water Management sent 26 specialists with higher and 41 specialists with secondary education. As of January 1, 1988, 3,591 people worked in the department. Among them, 1018 people worked as engineers, 429 people worked as technicians, of which 357 people have higher education, and 858 people have secondary and special education» [25.p.6].



CONCLUSION

In conclusion, it can be said that the issue of training personnel for the irrigation sector in Uzbekistan was a constant focus of the Soviet government. Because the irrigation works were primarily directed to the development of cotton cultivation. Soviet authorities developed measures in both areas and tried to implement them throughout the period of their rule. In order to realize this goal, the work of training qualified specialists in the fields of irrigation and cotton growing has been launched. Professional personnel with higher education in the field of irrigation were trained at Tashkent Institute of Irrigation and Agricultural Mechanization Engineers, Samarkand Agricultural Institute and Andizhan Cotton Growing Institute, and middle-level personnel were mainly trained at hydromelioration technical schools and mechanization schools.

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CONCEPTUAL ANALYSIS OF THE IMPLEMENTATION OF THE PISA INTERNATIONAL ASSESSMENT PROGRAM IN THE NATIONAL EDUCATION SYSTEM

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ABSTRACT

In the article, the conceptual content of the PISA international assessment program, aspects of the formation and development of the conceptual basis of the assessment program: the stages of the historical formation of the assessment program concept, the coherence of the assessment program concept with the educational policy, the role of the Organization for Economic Cooperation and Development as an organization developing the concept of the PISA international assessment program and the critical aspects of the evaluation program concept are described.

KEY WORDS: *PISA international assessment program, conceptual content of the program, national education system, student literacy, quality of education.*

INTRODUCTION

In the era of global changes, the development trends of the education quality assessment system at different levels, Uzbekistan's participation in international comparative programs for the assessment of the quality of education, opportunities to increase the capacity of the education system, comprehensive analysis of the results of the international comparative program for the assessment of the quality of education, students' reading, natural sciences, mathematical thinking and positive thinking assessment of literacy, methodology of international programs, use of assessment criteria in the creation of national teaching-methodical and measurement materials, strategic directions of education quality assessment are currently the most urgent tasks of the education system.

RESEARCH METHODS

According to the concept of the PISA international assessment program, the main goals of the assessment program are defined as finding answers to the following questions: How do 15-year-old students meet the requirements of science and society? The main goal of the evaluation program is to determine the situation of students' use of the knowledge they learn at school in everyday life [5, 266].

RESULTS AND DISCUSSIONS

The mission of the PISA international assessment program is to provide the necessary information to find answers to the following questions facing the participating countries, ministries and agencies responsible for education:

- Are students sufficiently prepared to take an active role as citizens in a democratic society at the end of compulsory education?
- do students have the ability to analyze, justify and communicate their ideas and imaginations?
- are students receiving education at school based on the requirements of the current labor market?
- do students meet the requirements of the "lifelong learning" concept? [1, 9].

The PISA international assessment program allows for the analysis of school education as well as the necessary information for other stages of education. Such information is of great importance in the continuing education system. In 2000, a total of 250,000 students from 32 countries participated in this program [1, 10].

Politically, the PISA assessment program is managed internationally by the PISA Governing Board (PISA). The PISA international assessment program was put into practice in 1997 by the initiative of the Organization for Economic Cooperation



and Development (OECD), and has been implemented since 2000 and is conducted every three years [4, 9].

In 2018, 78 countries (economy) participated in the PISA international assessment program, and 88 countries (economy) are planned to participate in 2022. The PISA international assessment study, scheduled for 2021, was moved to 2022 due to the pandemic. This indicates that the PISA international assessment program is growing in importance and coverage in the world. Of the 88 participating countries, 83 have computer-based assessment programs. Special training seminars are organized for the responsible organizations of the participating countries, and these seminars include reviewing the scope of questionnaires, organizing the process of approving program tasks and forming the necessary database, implementing harmonization processes for questionnaires, compliance with technical standards of the program, its difference from previous programs, included changes, sampling processes of schools and students, organization of translations, use of a special portal for translations, organization of activities of national centers responsible for programs and requirements for their employees, translations, adaptation and coding of questions and other organizational issues are considered. In addition to tasks aimed at assessing the basic competencies of students, questionnaires are organized for students and teachers, school management staff. Questionnaires are formed based on the national characteristics and values of the participating countries. These questionnaires provide an opportunity for empirical inquiry for pedagogical research in education. In particular, the tasks that evaluate the basic competencies of students are thoroughly reviewed by subject experts. Educational testing service and attached higher educational institutions are involved in this process. For example, the Luxembourg Center for Educational Testing (LICET) at the University of Luxembourg is responsible for the 2022 evaluation program. Program assignments for 2022 will be ready in March 2019. The preparation, translation, and approval of program assignments is a complex process, and this process involves independent agencies of Linguistic control, Educational Testing Service, and Scientific Program Councils.

It is necessary to study the formation and development of the conceptual foundations of the PISA international assessment program in 4 aspects:

1. PISA international assessment program stages of historical formation of the concept.
2. Integration of the PISA international assessment program concept with education policy.
3. Organization for Economic Cooperation and Development (OECD) role as an organization developing the concept of international assessment program PISA.
4. Critical aspects of the PISA international assessment program concept.

PISA international assessment program stages of historical formation of the concept. The history of international evaluation programs in the educational system was actually founded in 1958 by a number of European countries and the United States in the city of Hamburg, the International Association for the Evaluation of Educational Achievement. The Association is a non-governmental scientific organization, the pedagogic scientist B. Blum, psychometric scientist R. L. Thorndike, famous in international educational programs, are members of it [4, 11]. The purpose of the association was to complement the results of the empirical program on the quality and historical development of education, the change of traditions in education.

Also, the main goal was to compare the educational process based on the results of the program in the international framework based on uniform criteria [4, 12]. Before the creation of the association, mature scientists of the world have been researching the cultural and social aspects of the educational process in different countries. In 1960, the International Association for the Evaluation of Educational Achievement (IEA) began to conduct the first international benchmarking programs. In 1964, the International Association for the Evaluation of Educational Achievement (IEA) conducted the first international assessment program in mathematics - FIMS (The First International Mathematics Study). One of the main organizers of this evaluation program was the German Institute for International Pedagogical Programs (DIPF Deutsche Institut für Internationale Paedagogische Forschung). This assessment program is intended for 7th grade students [4, 8].

From 1966 to 1973, the "Six Subjects Survey" (Six Subjects Survey) was conducted with the participation of 21 countries with the participation of world-famous educational scientists, including J.B. Carroll. In this evaluation program, 6 subjects: natural sciences, literature, reading, English language, French as a foreign language, as well as political education subjects were conducted. At the beginning of the 1990s, the International Association for the Evaluation of Educational Achievement - IEA began to conduct an assessment program (Reading Literacy Study) for 9-14-year-old students [2, 20]. This evaluation program was the impetus for the subsequent PIRLS/IGLU evaluation program.

Since 1991, the International Adult Literacy Survey (IALC International Adult Literacy Survey) has been conducted for adults (ages 16 to 65) covering 21 countries [3, 16]. Since 2010, international assessment programs (PIAAC - Program for the International Assessment of Adult Competencies) have been held. This assessment program is organized by the Organization for Economic Cooperation and Development. Currently, 35 industrialized countries are participating in this program.

TIMSS Third International Mathematics and Science Study, which has been held since 1995, is an international assessment program conducted every four years by the International Educational Achievement Assessment Organization - IEA. This program is based on the previously mentioned assessment programs - FIMS (First International Mathematics Study, 1964, 12 countries) and Second International Mathematics Study SIMS (Second International Mathematics Study, 1980-1982, 20 countries), in addition to the First and It was conducted as a continuation of the Second International Science Study programs (First and Second International Science Study, 1968-1972 and 1982-1986). Currently, this International Assessment Program is



called the International Mathematics and Science Quality Program (TIMSS – Trends in International Mathematics and Science Study).

Integration of the PISA international assessment program concept with education policy. Since 1950, the IHTT has started a comparative analysis of statistical data on the education system of the member states. The purpose of this comparative analysis was to study the needs of qualified specialists through educational planning in industrialized countries. The comparative analysis of statistical data is important not only from an economic point of view, but also from a socio-political point of view, and it provides the opportunity to have the necessary data for the analysis of the issues of equal rights in education. The initial approach of IHTT member states focused on statistical data, which compared states' spending on education, that is, state funding of education and funding resources. Since 1992, statistical reports have been published by IHTT in the form of reports under the name "Education at a Glance". Educational evaluation criteria developed by this initiative of IHTT have been widely used in fields other than education, including economy, socio-political fields, and educational programs [3,17].

In the late 1990s, IHTT directed the expansion of educational evaluation criteria to include the measurement of competencies achieved in education. By doing this, it is aimed not only to compare the costs of education financing or resources, but also to measure the results achieved by students in education. The experiences of the International Association for Assessment of Educational Achievement led to the implementation of the PISA international assessment program. The results of the PISA international assessment program serve as a source of information for the national education policy of the participating countries, for determining the direction of educational reforms, and for scientific research. The PISA international assessment program provides an opportunity to study the systematic characteristics of the basic competencies of 15-year-old students in reading, mathematics and natural sciences [1, 13].

The role of the Organization for Economic Cooperation and Development (OECD) as an organization developing the concept of the PISA international assessment program. IHTT is an organization created to politically support the economy and social life of industrialized countries. The main purpose of this organization is:

- creation of new jobs;
- allocation of funds for economic development and growth of living standards, conducting policies related to financial and economic spheres;
- managing international competitiveness, especially in the process of opening borders for global production and trade, assisting governments in improving economic efficiency and quality systems;
- ensuring growth of human capital through education [1, 14].

IHTT's educational evaluation criteria are evolving over the next decade, and the criteria are made available to the general public in the organization's Education at a Glance report. The evaluation criteria are developed within the framework of the "Indicators of Educational Systems" (INES - Indicators of Educational Systems) project. Evaluation criteria include comparative information on human resources and financial resources spent on education, tasks of the education system, progress and investment in education.

The PISA assessment program is one of the IHTT's projects in the field of education, and the program aims to assess and compare the basic competencies of students in an international framework. According to the concept of the international assessment program PISA, the program focuses on real-life competences, and less attention is paid to the knowledge that students acquire in school through subjects. The PISA international assessment program first of all examines the basic competencies formed by students before the end of compulsory education, depending on their knowledge and concepts in the school curriculum [1,17].

An international team of experts continuously refines the overall concept of the program, and this concept allows for the measurement of core competencies. It should be noted separately that the purpose of the program and the methods, principles and criteria used, and the interpretation of the results of the program have been the cause of wide discussions. Since its implementation, the evaluation program has been improving, incorporating the important aspects of modern development stages into the content of the program. As a result, the number of countries participating in the program is increasing year by year.

Critical aspects of the PISA international assessment program concept. The assessment program concept is not without flaws. The countries participating in the PISA international assessment program and the national coordinators responsible for the program, pedagogues, constantly express critical opinions taking into account the characteristics of the national education system, principles, educational policy, the content and essence of the educational process, and on this basis approach the research with new concepts and directions to the development of the educational system. will increase the efficiency of using the program.

The PISA international assessment program does not provide an opportunity to determine the following situations:

1. The PISA international assessment program does not allow to determine which country has a "good" or "bad" education system, but rather it determines the current state of students' basic competencies at a certain time (every three years).
2. The results of the PISA international assessment program do not reveal the "strengths" or "weaknesses" of the national education system of the participating countries. The results of the evaluation program provide an incentive to determine the possible relationship between the problems in the educational system and their solutions.



3. The PISA international assessment program does not determine the directions for the development of the quality of the national education system. The results of the evaluation program provide scientifically relevant, reliable data for various educational research professionals. Using this information, reforms will be planned to improve the quality of the education system.

Conditions for education and development. The PISA international assessment program assesses conditions for learning and development using questionnaires along with core competencies. This assessment is aimed at determining the factors affecting the formation of basic competencies in students. In particular, the students' interest in the learning process, the importance of studying for their lives, the conditions created for the students' education in the family and at school are studied. For example, it is researched whether the formation and development of basic competencies of students depends on school education, educational activities, or the social origin of students and the state of development of their basic competencies. These data provide an opportunity to effectively organize the educational process, develop a positive attitude of students to education, and analyze the strengths and weaknesses of educational standards. Out-of-school education, independent education and conditions of students, the formation of academic capital in the family of students are reflected in the content of this questionnaire.

In addition to assessing basic competencies, the PISA international assessment program identifies factors influencing the formation of basic competencies through questionnaires to students participating in the program, their parents, teachers, and school administrators. Through questionnaires, school and extracurricular teaching and learning environment is researched. Through a questionnaire intended for students, the development of basic competencies is investigated in relation to socio-economic and cultural factors. The questionnaire for parents is optional for the countries participating in the international assessment program PISA, and it concerns the conditions for studying at home and how parents support the development of their children's basic competencies. The purpose of the questionnaire for the school administration is to determine the relationship between the conditions of teaching and learning and the formation of basic competencies. Through this questionnaire, the structure and resources of the school, the conditions created by students in subjects are studied in detail.

The term "literacy" is used in the international assessment program PISA, which corresponds to the term "savodxonlik" in the Uzbek language. This term refers to a set of basic competencies that determine the student's readiness for social life [5,255]. The term "literacy" is not the competencies formed within a certain subject, but the ability of the student to find his place in society, to start a professional activity, to have the skills of personal development, to have an appropriate attitude towards society, political, economic, social life, technique, technology, "active citizen", Competences necessary for acquiring tasks such as "high-level consumer", "reasonable user of the environment and resources" are provided.

Table 1**Processes and requirements for the individual presented in the PISA international assessment program concept**

Processes	Necessary requirements imposed on the person
Globalization	The formation of a sense of duty to humanity
Political	Formation of active citizenship position
Economical	Consumerism with a rational attitude
Social	The formation of the position of an active and developed person with a developed social consciousness
Technical	The pursuit of novelty, convenience
Depends on the environment	Wise use of resources and active promotion

As mentioned above, the PISA international assessment program aims to investigate students' literacy in reading (reading literacy), mathematical literacy (mathematical literacy) and science literacy (science literacy). Also, students' literacy in computer, financial literacy, foreign language, creative thinking, "learning in the digital world" is checked, and one of them is selected for the research conducted every three years. It is optional for countries participating in the program.

In accordance with the concept of the international assessment program PISA, the term "literacy" is presented as "a set of basic competencies". In our opinion, the international assessment program PISA puts a lot of emphasis on researching the ability of students to be observant, aspiring and apply the knowledge learned at school in different situations and situations in everyday life. Assignments such as these have been recognized by various experts as appropriate for an assessment program. Various situations, issues, problems or situations related to professional activities and students' lives are complex and require students to apply their knowledge, experience and skills.

In our opinion, there are three important positive aspects of the definitions of the terms "competence", "basic competencies" in the PISA international assessment program concept and state education standards, and their division into different competencies according to their content:

1. The term "core competencies" is used as a "means" to express the purpose stated in the regulatory documents. Examples include the concept of the PISA international assessment program and the terminology used in state education standards.



2. "Basic competences" serve to express the social order set by the state and society in the educational content. In this regard, IHTT and the Ministry of Public Education, although they are expressed differently in the normative documents, broadly repeat and complement each other, but there are differences according to the formation of the term and the context in which the term is used.

3. The basic competencies listed in the state educational standards are inextricably linked with the competencies related to science. The "basic competence" presented in the concept of the PISA international evaluation program essentially denies dependence on a specific school subject.

Based on the analysis of scientific literature, educational and regulatory documents, it was found necessary to use the following term: the basic competencies of the student are the knowledge, skills learned in school and outside of school (independent education, family, society, with the help of mass media, in various non-school educational institutions) in accordance with his age development, skills in society, nature, technology, economy, social spheres, as well as in the context of globalization, to independently understand, analyze, make decisions and express one's attitude, to think far, to consider different points of view (environment, humanism, nationalism, patriotism, rationality, using mathematical models) taking into account their solutions, conclusions, proposals are expressed as the result of formation processes.

In our opinion, the presentation of basic competencies as "results of processes" fully interprets the fact that these competencies are constantly formed in students, and their components complement each other and develop.

Pupils develop the ability to solve various life problems and situations throughout their lives, and their social experiences increase. Pupils develop basic competencies by expressing their ideas, views, and attitudes in various problem situations. In the formation of basic competencies, school education, independent education, family environment, environment, extracurricular environment have their influence. Formation of basic competencies in students is important for their successful preparation for professional activities. Therefore, personal competencies such as "responsibility", "responsibility for one's own activities", "working in groups", "showing one's results", "self-management in difficult situations", which are components of professional activity, are formed in parallel with the basic competencies.

Today, there are authoritative international organizations that conduct research on the evaluation of the achievements of the world's educational system and help in the implementation of reforms. The Organization for Economic Co-operation and Development (OECD) conducts research to find solutions to problems in various fields. In particular, on the basis of this organization, the PISA international assessment program was developed in order to develop general secondary education, which is the main link of the education system. The reason why the economic organization turns to the education sector is that the personnel for any field is first of all grown up in schools and ordinary classrooms. The changes taking place in the world, including globalization, political, economic, social processes, technical and technological development, environmental and resource use, put new tasks before the educational system. The PISA international assessment program has been conducted every three years since 2000 to examine the literacy of 15-year-old schoolchildren in reading, mathematics, and natural sciences, as well as computer literacy, creative thinking, and foreign language literacy. The Republic of Uzbekistan will participate in this assessment program for the first time in 2022, and the organizational-methodical stage is currently being implemented. This serves as a database for conducting systematic, continuous national monitoring of the national education system and determining the direction of education policy. As a result, the quality of education will be increased, having a significant impact on the national education policy. The international assessment program PISA helps to determine the conceptual direction of developing students' intellectual potential. Another important goal of the program is to ensure that students engage in lifelong learning.

The PISA international assessment program requires teachers to evaluate the quality of assignments given to students in the learning process and review the assignment of assignments. The PISA international assessment program summarizes the results across groups, schools, social classes of the population, and countries and provides educational information in the form of statistics for various aspects of society. This evaluation program plays a complementary role to the educational and training function of schools.

CONCLUSION

The purpose of the PISA international assessment program is to determine how 15-year-old students meet the demands of science and society, to study the situation of students' application of the knowledge they learn at school in everyday life. Methods of measuring students' literacy have been developed for research, and through these methods, students' literacy in reading, mathematics and natural sciences will be determined, based on which the rating of the participating countries will be developed. Students' core competencies are formed not on the basis of a specific subject, but on the basis of interdisciplinary integration, personal observations of students, social experiences and independent learning.

The analysis of scientific literature, educational and regulatory documents shows that the basic concepts, principles and methods of assessment presented in the assessment program require certain pedagogical conditions for their implementation in pedagogical practice. On the one hand, this requires making changes to the content of existing educational and regulatory documents, and on the other hand, it requires reconsidering the organizational and methodological aspects of the educational process, didactic possibilities of teaching subjects.



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INFLUENCE OF OWN BODY RESISTANCE TRAINING ON SELECTED PHYSICAL FITNESS VARIABLES AMONG SCHOOL BOYS

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ABSTRACT

This study was designed to influence of own body resistance training on selected physical fitness variables among school boys. To achieve the purpose of the study 30 school boys were selected from Government Higher Secondary School, Kalveerampalayam. Their age ranged between 15 and 17 years and they were divided into two equal groups consists of 15 each. Group I underwent the Own Body Resistance training and Group II acted as control group. The training was given to the experimental group for 3 days per week for the period of 12 weeks. The control group was not given any sort of training except their routine work. The data were collected from the subjects was statistically analyzed with dependent 't' test to find out significant improvement if any at 0.05 level of confidence. The results speculated that the muscular endurance and flexibility of school boys improved significantly due to the influence of own body resistance training with the limitations.

KEY WORDS: *Own body resistance training, Flexibility and Muscular endurance.*

INTRODUCTION

Own body weight exercises are strength training exercises that do not require any weights the practitioner's own weight provides the resistance for the movement. Movements such as the push-up, the pull-up, and the sit-up are some of the most common bodyweight exercises. Exercise training using only own bodyweight for a 10-month period in elderly individuals successfully increased maximum force by approximately 15% and power output by approximately 13%, but left unchanged maximum unloaded velocity of leg multi-joint movements. The magnitude of increase in maximum force showed a positive correlation with initial training intensity in elderly individuals. These results suggest that an introductory training program using only own bodyweight in elderly individuals can be effective for improving their lower limb muscle function however, bodyweight relative to maximum force was important in determining the effect of exercise training program with using only bodyweight for elderly individuals. The evaluation of muscle functions should be translated into the physical ability of speed, strength and power. These abilities are important for physical activities in daily life and sports. Thus, the force-velocity relations of muscles are one of the critical factors to determine the physical performance and the mechanical power of muscle movements. It is well known that velocity of shortening depends on generated muscle force. (Yamauchi, 2009)

METHODOLOGY

Purpose of the study was to find out the Own body resistance training on selected physical fitness variables among school boys. To achieve the purpose of the study 30 school boys were selected from Government Higher Secondary School, Kalveerampalayam. Their age ranged between 15 and 17 years and they were divided into two equal groups consists of 15 each. The selected physical fitness variables namely, muscular endurance was measured by push ups test and flexibility was measured by sit and reach test. Group I underwent the Own body resistance training and Group II acted as control group. The training was given to the experimental group for 3 days per week for the period of 12 weeks. The control group was not given any sort of training except their routine work. All the subjects involved in this study were carefully monitored throughout the training program, none of the reported with tear and muscle soreness. The data was statistically analyzed with dependent 't' test to find out the significant improvement between pre and post test. In all cases the criterion for statistical significance was set 0.05 level of confidence.

**RESULTS****TABLE - I**
ANALYSIS OF 'T' RATIO FOR MUSCULAR ENDURANCE AND FLEXIBILITY

Variables	Group	Test	Mean	SD	SEM	t-ratio
Muscular Endurance	Experimental Group	Pre test	11.95	0.68	0.15	16.24*
		Post test	14.43			
	Control Group	Pre test	12.05	1.80	0.40	1.86
		Post test	12.80			
Flexibility	Experimental Group	Pre test	25.10	1.08	0.24	21.92*
		Post test	30.40			
	Control Group	Pre test	24.85	2.03	0.45	1.31
		Post test	25.45			

(Significance at 0.05 level of confidence for df of 14 is 2.14)

Table I shows that the pre test mean values of experimental group and control group 11.95, 25.10 and 12.05, 24.85 respectively and the post test mean values are 14.43, 30.40 and 12.80, 25.45 respectively. The obtained dependent t-test, t value on muscular endurance and flexibility of experimental group are 16.24 and 21.92 respectively. The table value required for significant difference with degrees of freedom 14 at 0.05 level of confidence is 2.14. The obtained 't' test value of experimental group was greater than the table value. The results clearly indicated that the muscular endurance and flexibility of the experimental group improved due to the own body resistance training on school boys.

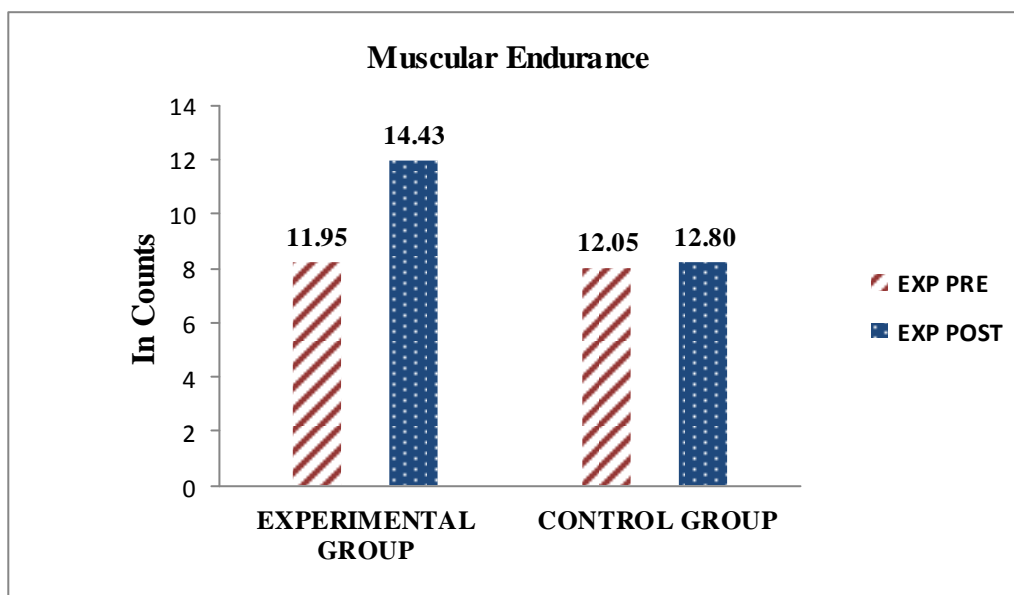
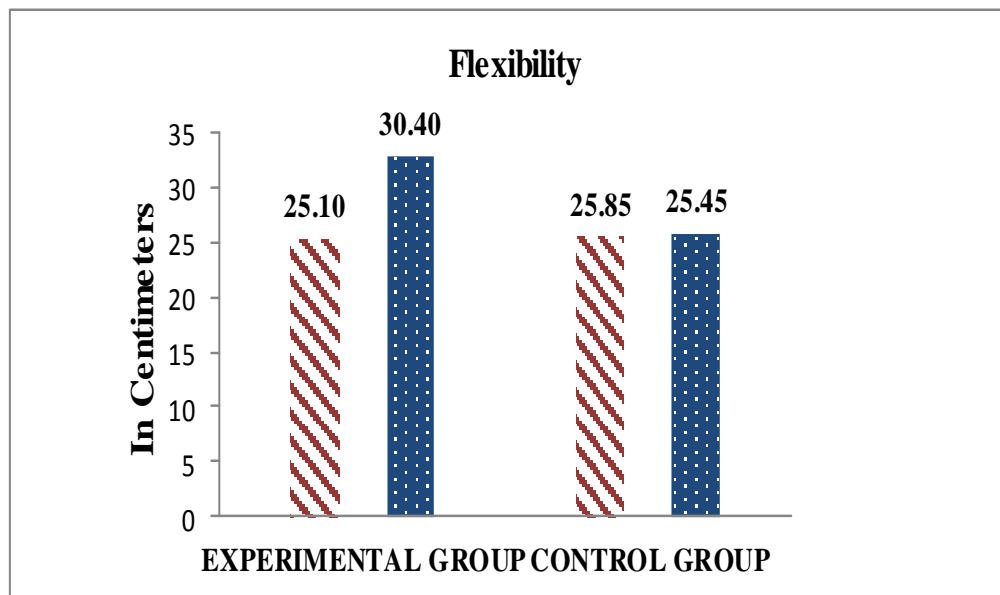
FIGURE -I
BAR DIAGRAM OF EXPERIMENTAL AND CONTROL GROUP ON MUSCULAR ENDURANCE



FIGURE-II
BAR DIAGRAM OF EXPERIMENTAL AND CONTROL GROUP ON FLEXIBILITY



DISCUSSIONS ON FINDINGS

The result of the study on selected physical fitness variables namely muscular endurance and flexibility indicates experimental group (Own body resistance training) caused significant improvement after the Own body resistance training. Based on the mean value, the experimental group was found in better increasing on muscular endurance (Arumugam et al., (2019)) and flexibility (Devaraju et al., (2012)) when compared to the control group.

CONCLUSION

Own body resistance training have lot of exercises and movements related with muscular endurance and flexibility, the exercises can develop our flexibility and muscular endurance also. So own body resistance training helped to develop the flexibility and muscular endurance. The results of the study Own body resistance training group had significant improvement on muscular endurance and flexibility when compared to the control group.

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LABOUR WELFARE MEASURES OF WILD CRAFT LTD SUNKADAKATTE BANGALORE

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ABSTRACT

Wild craft is an Indian outdoor gear retail company headquarters located in Bangalore. Founded in 1998 by Dinesh kaigona halli, Siddharth Sood and Gaurav Dubish. The company has its roots in early Business of outdoor adventure kits shop started by Dinesh in 1993. The concepts were to make gears which will stand the Tough terrains.

KEY WORDS: Wild Craft, Employees, labour, welfare, products, service, fund.

I. INTRODUCTION

"Wellbeing is a broad phrase that refers to an individual's or a group's state of living in a desired relationship with the overall environment, ecological, and social welfare encompasses both social and economic aspects. What you would want to see altered in this section / then, below, click the paraphrase button. It's that simple!"

The humanitarian approach had a significant impact on an employee welfare initiative in India. After an employee is employed, an organization's total growth depends on the production of goods and services. Trained and compensated personnel must be retained and maintained for this to happen. Welfare facilities have mostly been developed to take care of an employee's wellbeing, which ultimately results in the employee's physical, mental, and moral health.

The factors of welfare include a safety helmet at work, a first aid kit in case of an emergency if an employee is hurt while working, food and water, which are the most important things in our daily lives, should be provided, shelter should be available in case employees from other locations come to work, and some workers may suffer from inadequate ventilation, so the factory should have that facility. The Indian government established the Employee Welfare Committee in 1909.

II. STATEMENT OF PROBLEM

Employee welfare has always been a priority for management. A contented workforce is critical to every organization's industrial growth. Labour welfare schemes can be viewed as a "smart investment" that attracts contented personnel to a business and helps it achieve its objectives.

III. OBJECTIVES OF THE STUDY

- To determine the level of public awareness about labor issues
- To have a better understanding of the organization's social security plans
- To understand the working conditions in the organization

IV. REVIEW OF LITERATURE

1. **Kumar and Yadav (2002)** titled Level of satisfaction from employee welfare schemes in sugar factories in Gorakhpur division, indicated that both private and public sugar companies had poor levels of overall worker satisfaction with welfare programmes. Additionally, the workers in both industries placed the four employee welfare programmes according to their value, with the case programme coming in first, followed by the medical programme, education programmes, and then recreational programmes.
2. **Robinson, Sparrow, Clegg, & Birdy (2006)** in a study identified the key behavior, which were discovered to be related to worker engagement. Belief in the organization, the drive to improve things, acceptance of the business environment and the "greater picture," respecting and assisting colleagues, being willing to "go the additional mile," and staying current with industry advancements were among the behaviors listed.
3. **Manzini and Gwandure (2011)** studied that the concept of employee welfare has been used by many organizations as a strategy of improving productivity of employees; especially in the mobile industry since work related problems can lead to poor quality of life for employees and a decline in performance. It is argued that, welfare services can be used to secure the



labour force by providing proper human conditions of work and living through minimizing the hazardous effect on the life of the workers and their family members.

4. **Patro (2012)** identified that the employees are assets of any organization. The needs of the employee must be satisfied in order to meet the goals of the organization.

V. TYPE OF RESEARCH

The study's methodology was descriptive. As the name suggests, descriptive design is done to describe something. The circumstances that led to the performance appraisal system in Wild craft are discussed in this paper. In this case, descriptive research was carried out to learn more about the issue and to highlight the areas that require managerial

VI. SCOPE OF THE STUDY

The research will assist management in reducing the work-related problems, increasing the motivational activities and developing personnel in order to their professional objectives. Workers get the chance to offer suggestions that will help management make adjustments to future welfare and other facilities.

VII. SOURCES OF DATA COLLECTED

Primary data: The study does not depend on primary data collection.

Secondary data: Secondary data is reviewing of relevant information, which is already collected and making inferences based on the information collected. The secondary data used in the study includes Annual report, financial report and sourced through official website.

VIII. DATA ANALYSIS

TABLE 01
THE RESPONDENTS' AGE GROUP

Age	No of Respondents	Percentage
Less than 30 years	24	24
30 - 40 years	36	36
41 - 50 years	18	18
Above 50 years	22	22
Total	100	100

INTERPRETATION

The table above reveals that 36% of respondents are between the ages of 30 and 40. 22 percent of respondents are over 50 years old, and 24 percent of respondents are under 30 years old. 18% of respondents are between the ages of 41 and 50. It suggests that the bulk of respondents, or 36% of them, are between the ages of 30 and 40.

Chart 01
AGE GROUP OF THE RESPONDENTS

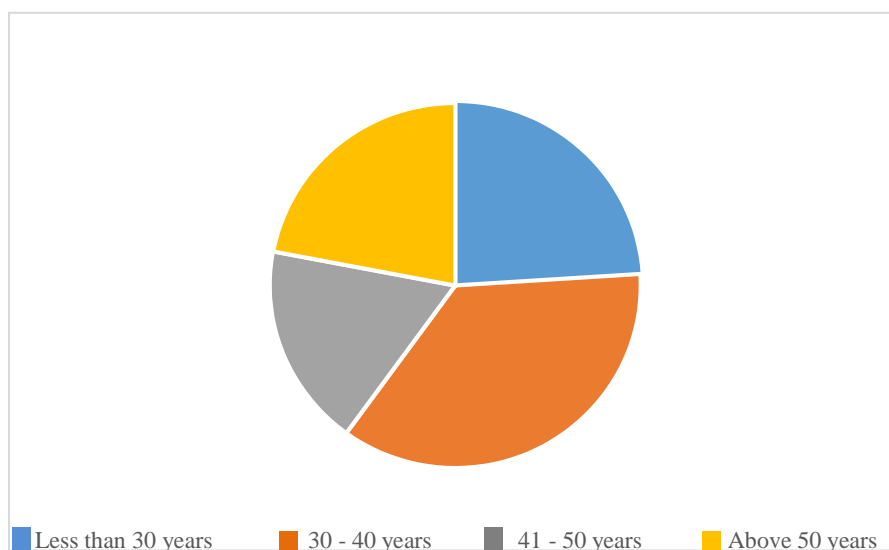




TABLE 02
EDUCATIONAL QUALIFICATION

Education	No of Respondents	Percentage
NON MATRIC	23	23
SSLC	42	42
PUC	22	22
Degree	16	16
Others	1	1
Total	100	100

INTERPRETATION

The above table shows that 23% of the respondents are non-matric 42% of the respondents educational qualification is SSLC, 22% of the respondents educational qualification is PUC 16% of the respondents educational qualification is degree and 1% of the respondents educational qualification is others It infers that majority i.e. 42% of the respondents educational qualification is SSLC.

Chart 02
EDUCATIONAL QUALIFICATION

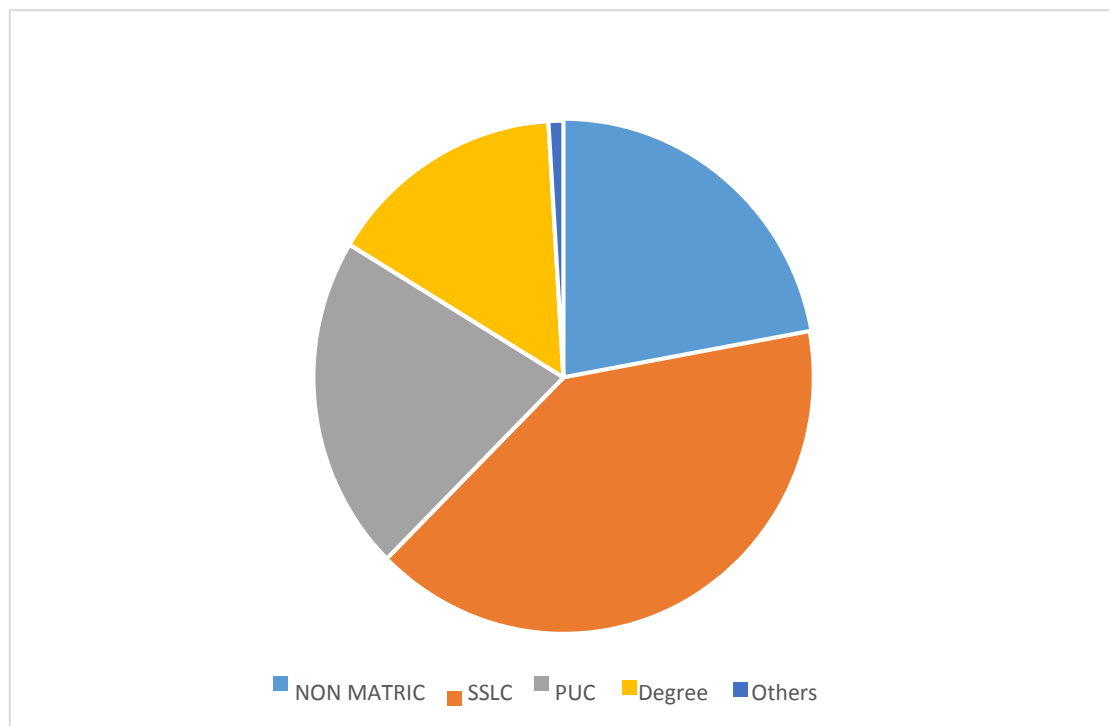


TABLE 03
WORK EXPERIENCE OF THE RESPONDENTS

WORK EXPREANCE	No of Respondents	Percentage
1-3 years	40	40
4-6 years	18	18
7-9 years	29	29
Above 10 years	13	13

INTERPRETATION

The above table shows that 40% of the respondents have 1-3 years of experience, 18% of the respondents have 4-6 years of experience, and 29% of the respondents have 7-9 years of experience and 13% of the respondents have above 10 years of experience. It infers that majority i.e. 40% of the respondents have 1-3 years of experience.



Chart No 03
WORK EXPERIENCE OF THE RESPONDENTS

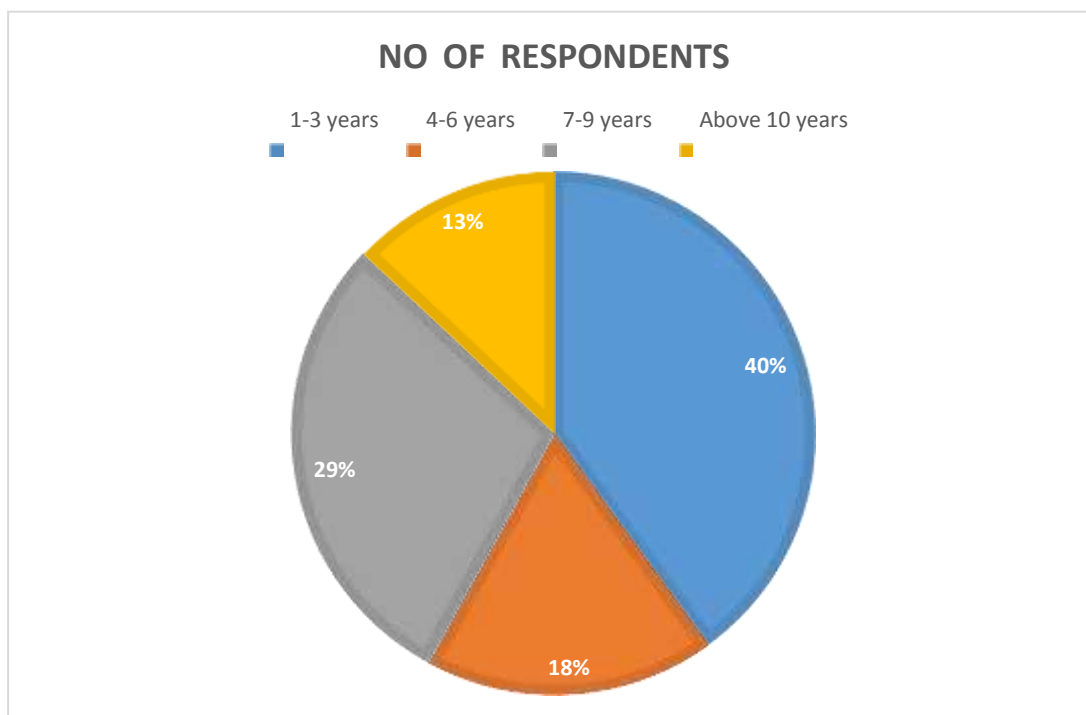


Table 04
MONTHLY SALARY OF THE RESPONDENTS

Monthly salary	No of Respondents	Percentage
Less than 10,000	55	55
Rs 10,000 – Rs 12,000	12	12
Rs 12,000 – Rs 14,000	13	13
Above 14,000	20	20
Total	100	100

INTERPRETATION

The above table shows that 20% of the respondents monthly salary is above Rs14000. 13% of the respondent's monthly salary is between the Rs12,000-Rs14,000, 12% of the respondents monthly salary is between the Rs 10,000-Rs12,000. 55% of the respondent's monthly salary is less than Rs10, 000, it infers that majority 45% of the respondent's monthly salary is above Rs10, 000.



Chart N 04
MONTHLY SALARY OF THE RESPONDENTS

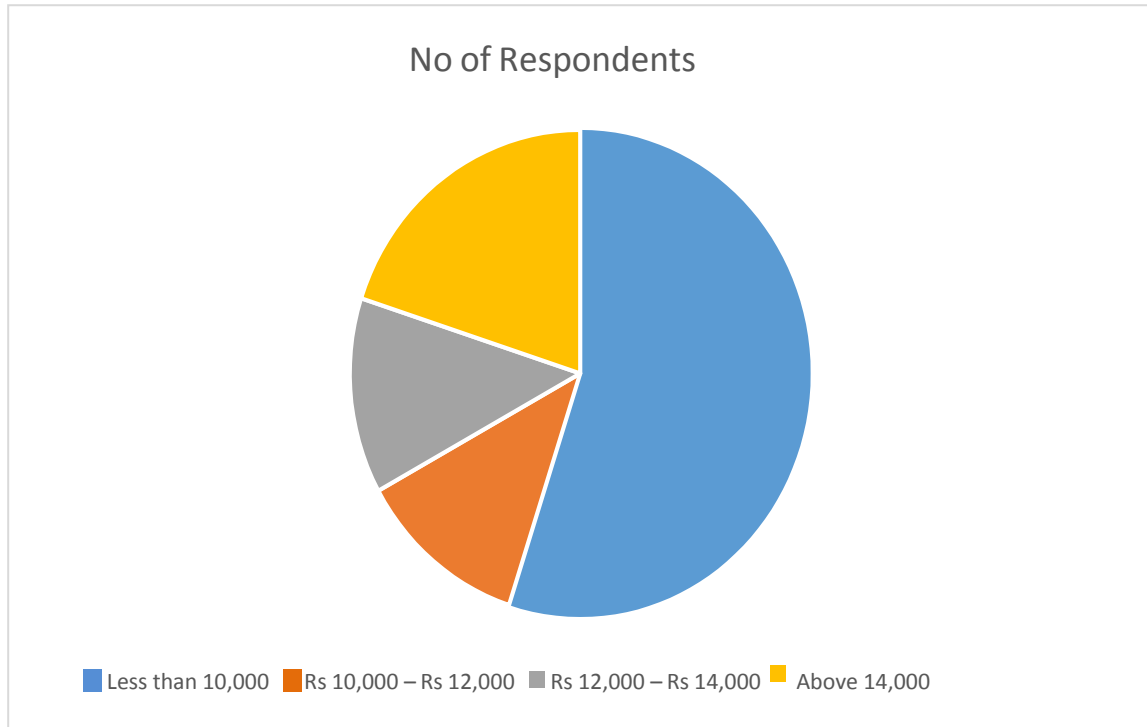


Table 5
RESPONDENTS LEVEL OF SATISFACTION WITH WELFARE MEASURES PROVIDED IN ORGANISATION

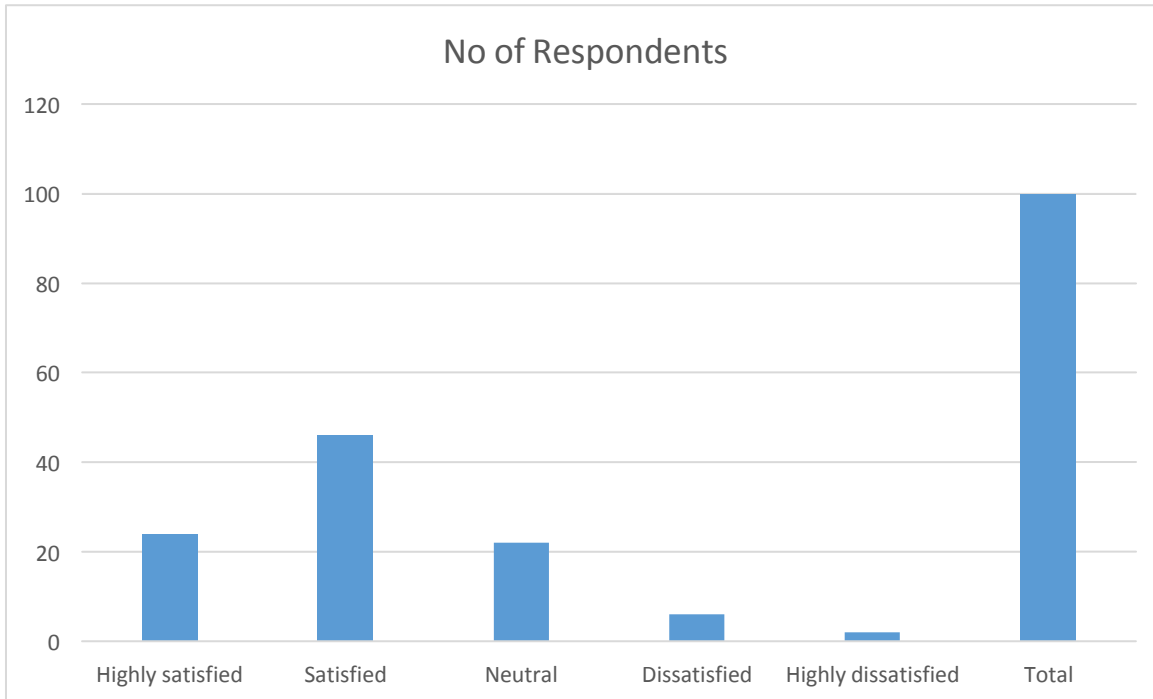
Satisfaction level	No of Respondents	Percentage
Highly satisfied	24	24
Satisfied	46	46
Neutral	22	22
Dissatisfied	6	6
Highly dissatisfied	2	2
Total	100	100

INTERPRETATION

The aforementioned table demonstrates that 24% of respondents are extremely delighted with the welfare measures offered by the organization, 46% of respondents are satisfied with the welfare the measures offered by the organization, and 22% of respondents have a neutral attitude. 2 present of respondents are extremely dissatisfied with the welfare measures offered by the organization, and 6 present of respondents are dissatisfied with such measures. a large majority 46 present of respondents said they are happy with the organization's welfare policies.



Graph 5
RESPONDENTS LEVEL OF SATISFACTION WITH DRINKING WATER FACILITIES



IX. FINDINGS

- The respondents' average age is between 30 and 40 years for 36% of them.
- SSLC makes up 42% of the respondent's educational background.
- The responders, 40%, range in experience from one to three years.
- The respondent's monthly pay is over Rs 10,000 for 45% of the time.
- The majority of respondents (46%) are very satisfied with welfare measures provided in organization

X. CONCLUSION

- welfare services are an important personnel function in a business.
- The effectiveness of the human component affects how well other production variables are used.
- The worker spends more than a quarter of his life in his working place. Therefore, the worker has every right to demand that the condition under which he works should be reasonable and provides proper safeguards for life and health.
- The amount of dedication, quality of work, commitment to the organization, morale etc. are all determined by the type and amount of welfare a worker receives



AUTOMATIC ENERGY METER USING IoT

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ABSTRACT

Now, days the consumption of electricity has become a basic need in the human life. The major issue faced in consumption of electricity is increased in the past few years. The traditional system is unable to track the electric meters. In traditional system the man power needs to be employed to note down the meter readings. Monitoring and keeping track of the power consumption record becomes a tedious task. To overcome this problem automatic energy meter is introduced. The automatic energy meter uses internet of things which saves energy and time. The energy meter automatically collects the remote data. In this project Arduino based electric meter is introduced and the data are monitored using the Blynk applications. The automatic energy monitoring system uses two types of sensors they are current sensors and voltage sensors. The current sensor we have used is SCT-013 Non-Invasive AC current sensor. The voltage sensor we have used ZMPT101B AC Voltage Sensor. The voltage sensor is the best because we can measure the AC voltage accurately with the help of the voltage transformer. The current and the voltage sensors are combined together in order to obtain the required parameters to calculate the amount of electricity consumed. The current sensor is interfaced with the voltage sensor. The data obtained from the sensors are collected and send to the Blynk application. The Blynk application dashboard views the voltage, current and the total unit of the power consumed in KWh.

KEYWORDS: current sensors, voltage sensor, Arduino, Blynk application

I. INTRODUCTION

Now a day's electricity has become a basic need for human beings. There are two major issues in the consumption of electricity one is the consumption of electricity has increased over the past few years. The second one is electricity theft where there is no control over the loss or theft of electricity. The smart electric meter is introduced to overcome the issues. The smart meter can measure the consumption of electricity and can prevent the theft of electricity.

The limitations faced by traditional electricity are meters are unreliable in nature. In order to perform the meter reading a large number of man powers along with a large number of inspectors need to be employed. The major drawback faced by the customers is payment processing. The payment processing is very expensive and it is a time-consuming process. Tariffs cannot be introduced on an hourly basis along with the meters for encouraging the customers to reduce the usage of electricity. The development of software and the related network infrastructure is really complicated.

The smart grid is the modern development technique in the electric grid. The electric grid is weaker with respect to the electric load variation. The increase in population has increased the load on the electric grid. The efficiency of the grid can be remotely controlled which in turn increases the reliability. The smart grid uses automatic sensors. These automatic sensors are responsible for sending the data to the utilities. The automatic sensor has the capability to relocate the power facilities which in turn avoids the power line failures. The concept of the smart meter is employed with the smart grid concept. The smart grid is recommended in various countries for sustainable development and infrastructure.

The smart meter uses an electric meter that is capable of monitoring and maintaining the consumption of electric power on a

regular basis. A smart meter enables two-way communications. The smart meter provides communication between the meter and the central system. Smart energy is software-based which power efficient device is. The smart energy device tracks the consumption of energy accurately and performs computations. The meter reading is transmitted over the wireless media therefore we can eliminate the manual reading collection. The benefits of the system are cost efficiency, reliability, and cost savings. The smart energy meters will provide information regarding energy consumption that was not available with the previous traditional system. The system allows easy disconnection and power connections from the remote site. The smart system is used to detect the tampering power line and send signals. The billing of electricity consumption will be sent through the GSM without the intervention of humans. Theft of electricity leads to power shut down in many rural areas. The main advantage of using the smart meter is low operational cost. The second is it saves more amount of time for the customers and provides a daily report about the meter readings. The customers are allowed to pay the electric bills through the online mode. The consumption of power can be reduced during the high peak time. The major advantage is it can automatically terminate the home appliances when they are not in use.

The total amount of electricity consumed in a house is referred to as power consumption. Power consumption is an important aspect of the supply of electricity. People should be aware and should preserve the electricity for future generations. The energy patterns very slowly depend on the usage of electricity. The consumption of energy patterns may vary due to the increase in the appliances.



The power supplied to each and every household by the energy companies is vast so people are neglecting the energy and its savings. Smart meter technology plays a vital role in managing energy utilities. The people participate in the process which in turn helps them to reduce energy consumption. Smart meter technology creates awareness among people about the level of power consumption. The consumption of power by the people is high which means the usage of devices is also high. The usage of the device is directly proportional to the number of devices used and the duration. The consumer depends on the monthly bill. The consumer does not know which appliances are consuming more energy. The understanding of people's behavior is achieved through analyzing how energy is used.

II. LITERATURE REVIEW

The authors in the paper [2] explain the behavior of the people towards the smart metering system. The services that are provided by the smart metering system like viewing the consumption of electricity, turning the electrical appliances, estimating the amount of the electric bill, and finally receiving the message from the smart metering devices. The paper mainly focuses on the consumption of electricity during the nights and the weekends.

The quantitative survey among various household appliances where presented in the paper [9]. This paper mainly focuses on the mapping of the customers' perception with the household appliances. A framework TAM is used for monitoring the household appliances. The TAM framework calculates the mean score and the standard deviation.

The authors in the paper [8] describes about the smart metering system which involves several meters which continuously monitors the appliances. The data is collected on a regular basis and send as a feedback to the customers. The smart meters helps the customers to reduce the energy consumption, safe and secure energy and reduce the emission of the carbon.

The authors in the paper [13] have developed an energy management system that is capable of controlling the transmission capacity and rate generation. The energy consumption is represented in the pictorial form which includes the details about energy prices, consumption of electricity, and cost of electricity under different circumstances.

The authors in the paper [14] have developed a smart meter for the market with respect to the customers and business organization. The paper mainly focuses on energy efficiency and the awareness created among the customers about energy consumption. The different feedback is collected and proposed to save energy and to improve energy efficiency.

The authors in the paper [15] discuss the smart metering system in Hungary. The meters have two ways of communication. The communication depends on tariff-based operations. For the purpose of communication tools such as Zigbee, WIMAX, and home area network are used.

The authors in the paper [10] describes about the consumption pattern in the household and office. The paper mainly focuses on the time reporting which is done through the web. The setup comprises of equipment's along with the related soft wares. Graph is observed on 2h hour's cycles. The analysis of the appliances mainly focuses on the water heater, printing done using the laser printers. The feedbacks are collected and send to the customers based on the application which consumes more power. The authors in the paper [12] have developed a home energy managementsystem. The client interface model is constructed using the XML. The graph is plotted against the actual price and the predicted price and maximum power utilization. To evaluate the energy management model test bed is designed. The result obtained

during the experiment has resulted in saving of 22% of electricity expenditure on daily basis.

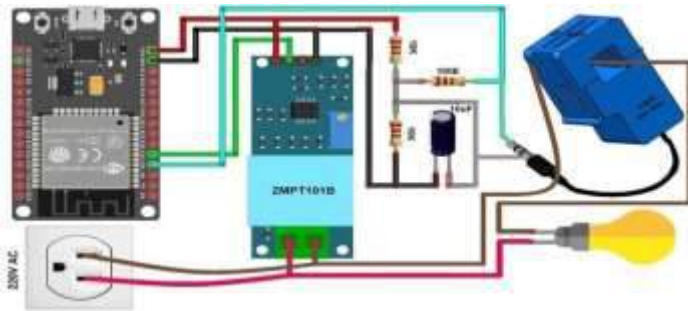
The authors in the paper [6] have developed a simulation model. The simulation models generate a load profile for the household appliances. The model is evaluated against the impact of smart appliances vs the variable price of the electricity bills. The power consumption of the household appliances is sent to the user in order to reduce the usage of the appliances. The load curves are demonstrated on the working days Saturdays and Sundays. The result obtained during the analysis is variable prices have affected the behavior of the customers under the environmental changes.

The authors in the paper [1] have mainly focused on the connection between the meters and the household appliances. The connection between the appliances is carried out in a different ways. The connection can be a dedicated connection, wireless, web based and power line connection between the home appliances and the meter. In order to improve the security the connection is made by connecting the meters to the data centers. The smart meter provides the complete information about the power consumption of a device through the mobile phones [5].

The authors in the paper [3] provide a scientific advice on how to consume the energy. The paper is worked against the set of question they are how the concept of feedback is useful for the energy consumption, how the feedback can help the users in the behavioral change, whether the feedback collected is good and effective. The implement the concept of security and privacy the authors in the paper [4] has implemented a smart metering system. The smart metering system works without the involvement of third parties. The smart metering concepts advantages are discussed in the paper [7]. The paper mainly focuses on the concept of reducing the metering cost, efficient use of energy system and finally detection of fraud.

III. ARCHITECTURE

The current and the voltage sensors are used in order to measure the power consumption and total power consumed. The current sensor we have used is SCT-013 Non-Invasive AC current sensor. The sensor is mainly used to measure the AC current up to 100 Amperes. The non-invasive is connected along with the supply line which is capable of measuring the load up to 30 Amps. The non-invasive allows us to calculate the amount of current passed through the devices. The main advantage of using this model is light weight equipment and can measure the amount of current passed through the devices. The voltage sensor we have used ZMPT101B AC Voltage Sensor. The voltage sensor is the best because we can measure the AC voltage accurately with the help of the voltage transformer. The current and the voltage sensors are combined together in order to obtain the required parameters to calculate the amount of electricity consumed. The current sensor is interfaced with the voltage sensor. The data obtained from the sensors are collected and send to the Blynk application. The Blynk application dashboard views the voltage, current and the total unit of the power consumed in KWh. The following figure 3.1 represents the circuit diagram of the automatic metering system.

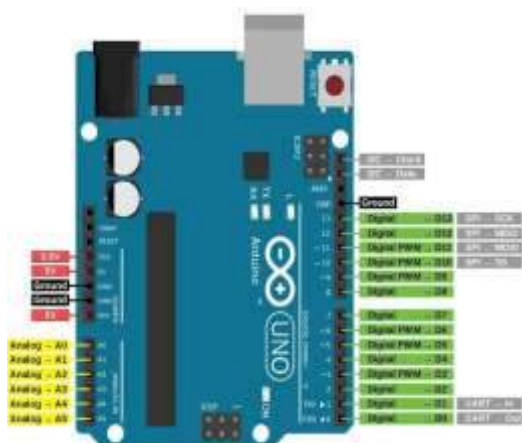
**Figure 3.1 Circuit diagram of automatic metering system**

IV. MODULE DESCRIPTION

The software requirements are Arduino IDE. It is a text editor mainly used for compiling the code to check if any errors whether any errors are present. Finally, the code is uploaded to the Arduino. The hardware requirements are Arduino UNO, Current sensor, voltage sensor, and jumper wires.

4.1 ARDUINO UNO

The following figure 4.1 represents the pin diagram of the Arduino UNO. There are 32 pins available. The 22 pins are associated with input and output. The 14 pins are IO pins which are configured to the application. The application is connected using the pin mode, digital write and digital read functions. There are 6 analog input pins. The analog pins provide 10 bit resolution where the data can be read using analogRead () function. The analog pins convert the analog value into digital value which can be read from the processor. The digital IO pins are capable of producing 8-bit PWM signals. The crystal oscillator helps the Arduino in handling the time issues. The voltage regulator helps the Arduino in controlling the voltage and stabilizes the Dc voltage used by the processors.

Figure 4.1 Pin diagram of Arduino UNO

4.2 Current sensor

The current sensor is mainly used for the purpose of power calculation and management of electricity-based applications. The current sensor can measure both direct current and alternating current. The voltage isolation is 2.2 kVRMS. The voltage isolation is integrated with a low resistance current conductor. The current sensors have mainly three pins. They are VCC, Ground, and Out pins. The working method of the current sensor can be direct or indirect sense. The direct sensing method uses ohms law to calculate the voltage. The indirect sensing method uses Ampere law to calculate the magnetic field in order to measure the amount of current being used. A Low effect hall sensor is used to measure the amount of current being transmitted. The current sensor is placed on the IC on a copper conduction path. Initially, when the current flows through the copper conductor it generates a magnetic field. The Hall Effect sensor senses the magnetic field generated through the copper wires. The voltage which is generated is proportional to the magnetic field sensed through the copper conductor which in turn measures the current. Figure 4.2 represents the current sensor.

Figure 4.2 Current Sensor

4.3 VOLTAGE SENSOR

The voltage sensor is a voltage sensing device that is capable of dividing the resistive voltage. The voltage sensor reduces the input voltage by a factor of 5. Once the voltage is reduced it generates the corresponding analog output voltage. In the initial stages, we used a 0-50 v DC voltmeter which is capable of measuring the output voltage. The 0-25 v voltage sensor uses analog input of the microcontroller. The analog input is used to monitor the voltage which is capable of sensing higher voltages. There are two types of voltage sensors they are capacitive voltage sensor and resistive voltage sensor. The resistive sensors have two resistors so that any voltage change can be amplified. The bridge circuit has four resistors. The bridge circuit is mainly used when there is a change in the voltage. The voltage sensor has 5 pins. They are VCC, ground, S, +, -. The VCC pin is a positive terminal that can handle a voltage of 0-25v. The Ground pin is the negative terminal of the voltage sensors. "S" denotes the analog pin which is connected to the pin of the microcontroller. The voltage sensor consists of two resistors. The two resistors have a resistance of 30KΩ and 7.5KΩ.



The Arduino accepts a voltage up to 5v. The main advantage of using the voltage sensors is small in weight, eco-friendly. The voltage sensors are used in multiple applications like detection of power failure, sensing the load, controlling the temperature, fault detection and controlling the power demand. The figure 4.3 represents the voltage sensor.

Figure 4.3 Voltage sensor



4.4 BLYNK FRAMEWORK

Blynk is an IoT platform mainly used for iOS or Android. Blynk is used to control Arduino, Raspberry Pi via the internet. The main advantage of this framework is that it creates a graphical interface or human-machine interface. The interface is finally compiled and provides the appropriate address available on the widgets. The second main advantage is that it can control the hardware devices remotely, it can display the sensor data, it can store the data, and finally can visualize the data. There are three major components used in the Blynk framework they are Blynk app, Blynk server, and Blynk libraries. The Blynk app allows us to create interfaces to various widgets. The Blynk server is mainly responsible for providing communication between smartphones and hardware. The Blynk libraries enable communication between different hardware platforms with servers. The libraries process all the incoming and outgoing commands. When the button is pressed in the Blynk application the data will move to the cloud and then finds the hardware in which it is installed. The main advantage of the framework is it provides minimal latency which can be used in limited geographical areas. The application has total control of data where the backup of data can be kept in the private server which in turn provides security of the data.

The steps that need to be followed: Download and install the **Blynk Application** from **Google Play Store** Once the installation is completed, open the application. Then using the sign-up option enters the Email id and Password. From the dashboard create a new project and select ESP32 & Wi-Fi Connection. Then drag & drop or add 4 widgets and assign the variable as per code and then email the authentication code. You will get the authentication code in the mail. Copy this authentication code. This will be used in your code. The figure 4.4 represents the Blynk application.

Figure 4.4 Blynk Application



4.5 REQUIRED LIBRARIES

EmonLib Library - The EmonLib Library is mainly used for Electricity Energy Meter. EmonLib continuously monitors the usage of electrical energy. The continuous monitor of electricity repeats every 5 or 10s. The output obtained will be a sequence of voltage and current measurements. The true average is calculated based on the voltage obtained and the current from different input channels. Finally the measurements are sketched and are available and should be read and the data needs to be processed.

Blynk Library - Blynk is the most popular Internet of Things mainly used for the iOS or Android. The Blynk app is used to control Arduino via the internet. The Blynk app provides a platform for connecting the hardware devices to the cloud, application designing to control them, and deploying and managing the products at different scale. The Blynk Library can connect over 400 different hardware models. The models include Arduino, ESP8266 & ESP32 to the Blynk Cloud.

V. RESULT AND DISCUSSION

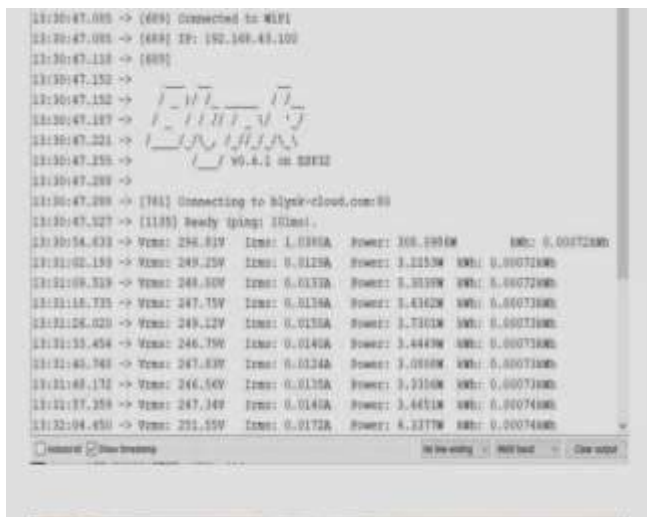
The following figure 5.1 represents the circuit diagram of the automatic metering system. The current and the voltage sensors are combined together in order to obtain the required parameters to calculate the amount of electricity consumed. The current sensor is interfaced with the voltage sensor. The data obtained from the sensors are collected and sent to the Blynk application.

**Figure 5.1 Circuit diagram of Automatic metering system**

The following figure 5.2 represents the creation for an account in the Blynk application. Once the installation is combined open the application on the android mobile. Then using the signup option enters the email id and the password.

Figure 5.2 Creation of account in the Blynk application

The following figure 5.3 represents the total unit of power consumed in Blynk application. The current sensor is interfaced with the voltage sensor. The data obtained from the sensors are collected and sent to the Blynk application. The Blynk application dashboard views the voltage, current, and total unit of power consumed in kWh.

Figure 5.3 Total unit of power consumption using the Blynk Application

VI. CONCLUSION

The smart energy meter is designed in such a way that it reduced the human labor load. The smart energy meter provides a more structural and organized method for energy consumption and billing. The system provides more security to the user from unwanted threats. The system provides more awareness to the user by providing the daily limit information which in turn helps the user to reduce the consumption of electricity. The automatic method proposed will help the electricity board to disconnect the connection if the users have not paid the bill in time. The system proposed helps in controlling energy consumption and avoiding the wastage of energy.

VII. FUTURE WORK

The smart energy meter works can be extended by conducting experiments on artificial neural networks. The methods like moving average with the different inputs can be used to predict different datasets. The advantage of using artificial neural networks is these models will be capable of comparing the relationship between the dependent and independent variables. The comparison between the variables can improve the future forecast which in turn will help to reduce the error in the previous forecast.

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COMPATIBILITY OF NATURAL FINE AGGREGATE WITH WASTE INDUSTRIAL STEEL SLAG IN CEMENT CONCRETE

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ABSTRACT

In this paper, waste industrial slag is used in concrete mix design to increase the compressive strength of concrete. The disposal of this type of industrial waste or by product is an environmental issue. Scientific analysis has predetermined their impact on nature; using waste slag in a creative way is a challenging task.

All laboratory scale experiments are performed to study the effect of complete replacement of fine aggregate by industrial waste slag on various parameters such as strength and durability of concrete mix. Here we replace fine aggregate with waste industrial slag.

Slag sieve analysis and mix design are performed in place of fine aggregate and compressive strength is checked after 7, 14 and 28 days respectively. A promising result was obtained after using slag in concrete. This paper reports the results of a feasibility study of waste industrial slag as fine aggregate in concrete.

KEYWORDS: *Specific Gravity, Compressive strength, Slag, Durability, Initial and final settling time, Fine aggregate, coarse aggregate*

1. Introduction

Removing sand from waterways increases the cost of sand and increases the financial visibility of the construction industry. Civil engineers have always been on the lookout for an alternative to the use of more environmentally friendly and readily available materials as a replacement for traditional components in concrete. Concrete industries have always welcomed the use of various industrial waste materials as replacements for those components.

Slag is a waste product generated in steel industries. One ton of steel means production of 130-200 kg of slag depending on the steel composition and steel production process. Slag appears as a granular material consisting of large clusters, coarse and very fine particles. Due to heavy dependence on steel industries, it is producing such large quantities which are causing environmental problems.[1]

It should be used to give proper output in concrete manufacturing for better implementation. Presently the consumption of slag in India is marked up to 20 to 25%. Fine aggregate is a key component in the application of construction industries such as plastering, concreting. Due to the boom in construction activities, the availability of natural fine aggregates has been exhausted. In this study we investigate the possibilities of using waste industrial slag as a replacement for natural sand in concrete.

2. NEED FOR THIS STUDY

Slag is a by-product of the steel and iron construction industry. These waste materials are not useful and are therefore dumped as landfills in the vicinity of the industry. Unprocessed waste can result in environmental problems and as a result waste disposal becomes a major issue. Thus, effective use of this material can bring economy and will no longer be an environmental concern.

3. OBJECTIVE

- To check the compressive strength with slag.



- To check the physical characteristics of the concrete with and without the slag.
- To reduce the voids to enhance the strength.
- To utilize the industrial solid waste in construction industry.
- To minimized the environmental problems created due to residual of steel industries.

4. MATERIALS

4.1 Cement

The cement use for this work is OPC 53 grade.

4.1 Physical Characteristics of cement

Specific Gravity	3.15
Consistency	24%
Initial setting time	97 min
Final setting time	206 min

4.2 Typical steel slag chemical composition.

Constituent	Composition (%)
CaO	40 – 52
SiO ₂	10 – 18
FeO	15 - 40 (70 - 80% FeO, 20 - 30% Fe ₂ O ₃)
MnO	5 – 10
MgO	5 – 8
Al ₂ O ₃	1 – 3
P ₂ O ₅	0.5 – 1
S	< 0.1
Metallic Fe	0.5 – 10



Fig.1 Slag



4.3 Experimental work

Sieve analysis test is carried out to check the feasibility of adopting the slag aggregate in concrete mix design. The result of the sieve and the IS standard limit for 20mm aggregate.

4.3 Sieve analysis result

Size of sieve (mm)	Cumulative passing Fine Aggregate	Cumulative passing Slag
Pan	91	90.6
150 micron	70.59	82.56
300 micron	58.38	68.93
600 micron	55.34	47.27
1.18 mm	21.34	22.03
2.36 mm	0	0

4.3.1 Experiment

In this experiment the cube of size 150x150x150mm of M35 grade overcast and testing is done after 7, 14, and 28 days respectively to check the compressive strength.



Fig 2:-Cube made by slag and fine aggregate

4.4 Net quantity required for 1 cubic meter

	Cement	Fine aggregate	Coarse aggregate	W/c ratio	Slag
Mix 1	436.233 kg	645.625 kg	1099.308 kg	0.45	-
Mix 2	436.233 kg		1099.308 kg	0.45	645.625 kg



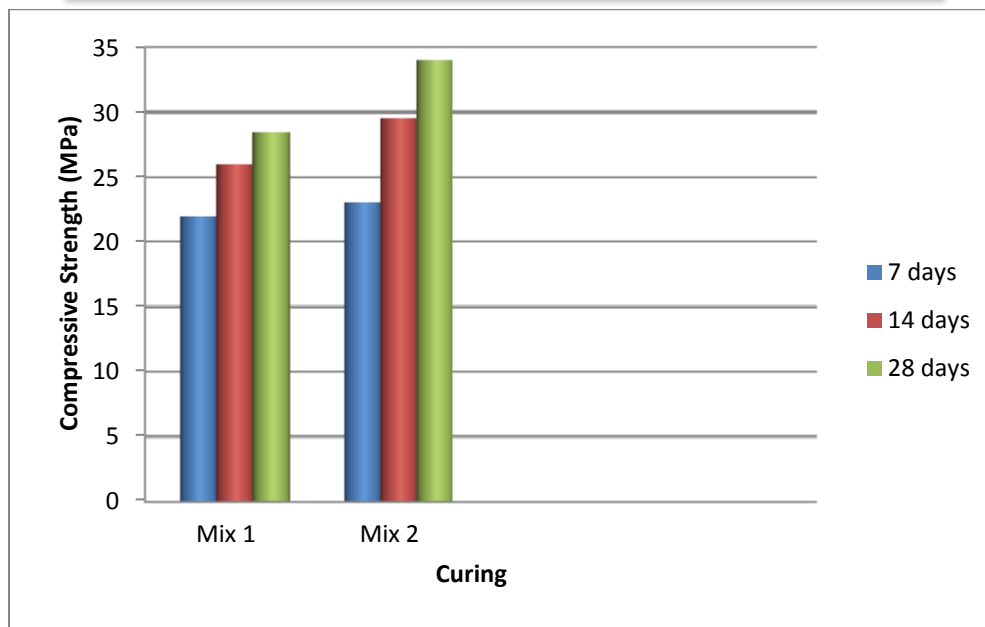
Fig 3:- Mix design by slag



Fig 4:- Mix design by Fine aggregate

4.5 Results

Design	7 days	14 days	28 days
Mix 1 (Fine Aggregate)	22 MPa	26 MPa	28.5 MPa
Mix 2 (Slag)	23 MPa	29.5 MPa	34 MPa

**1. Bar Graph**

5. CONCLUSION

- By doing this study we reduced the consumption of fine aggregate by fully replacement of Slag.
- The sieve analysis of steel slag indicates that it can be used as a replacement material of fine aggregate in the concrete mix.
- Mix design 2 (with steel slag) attains higher compressive strength on 7, 14, 28 Days respectively as compare to the concrete mix design 1 (with fine aggregate as sand).
- This study is not only useful for the use of the industrial solid waste products but also can helpful for the environmental aspect
- It should be noted that further research work is needed to ascertain the effect of waste industrial slag as a fine aggregate on the properties of concrete.

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LEARNING READINESS IN EDUCATION 5.0 AS INFLUENCED BY VALUE CREATION AND ACADEMIC PRODUCTIVITY

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ABSTRACT

Addressing the gaps as to trends in the teaching-learning process is the most fundamental approach to attain alignment among global demands, responsiveness to the needs of the various industries, and most of all in terms of transmitting learning among students. Thus, this study aims to determine the learning readiness level of the learners in education 5.0 considering students' value creation and academic productivity where the result may serve as the basis for designing a new learning landscape in the academe where the values of sustainability and adaptability are embedded as an essential chunk in the teaching pedagogy. As this study used a modified survey questionnaire, the study reveals that the level of value creation was "proficient," and in terms of the level of academic productivity, it was determined as "proficient." Inferentially, there were significant correlations among value creation, academic productivity, and learning readiness of learners in the education 5.0 era which entails that students' learning readiness was influenced by value creation and academic productivity. Thus, the result implies that value creation and academic productivity are of great influence on the achievement of the learners which may consider underlying factors in determining one's learning readiness. This study recommends active participation in seminars, workshops, and conferences presenting global trends to provide breakthroughs among the learners and teachers to enhance their knowhow of the relevant and responsive competencies.

KEYWORDS: Academic productivity, Education 5.0, Learners, Learning readiness, Value creation

INTRODUCTION

Education in today's time is in parallel with learners being treated according to their phase of learning and behavioral responses as it encompasses the academic adage "education is a continuous process where change is inevitable." In keeping the academic processes emplaced, especially in this time of pandemic where new learning modalities are introduced, it is very obvious that trends in the academe changeover as to curriculum, teaching pedagogies, learning modalities, and others. One of the recognizable changes in the academe is the education revolution where we are now, the Education 5.0 era.

Education 5.0 according to Derjoveda (2021) starts with humans, not technology. The academe revolution aims to underpin the achievement of humans as an outcome of a particular learning experience. This education era is not about providing every learner with gadgets, or even improving infrastructure and connectivity, but it is about preparing them to be globally competitive and holistically equipped considering intellectual, social and emotional factors. More so, this era aims as well to develop strong individuals and be mindful of their health and personal development.

This era's concern is on crafting appropriate strategic, methodological, and pedagogical approaches in teaching that include the ways to bring motivation, creativity, and joy of learning back to learners. Though in this time where blended learning is the pivotal learning modality, digital equipment, infrastructure, and platforms may still be crucial here, however, they only serve as enablers, and not the learning modality itself.

In the response to the implementation of education 5.0, the curriculum is placed to embed skills, concepts, and processes that students are expected to learn from kindergarten to university and the core of the aforesaid embedded essentials is academic productivity which is considered a soft skill or a personal strength that is learned through education or training where it can be improved through familiarization of common issues (Doyle, 2020) and the value creation which is the process of identifying and addressing the important needs of stakeholders better than any alternative that can be carried out by identifying the important stakeholder's needs and developing a compelling and quantified value offering (Williams, 2021).

Hence, to achieve a globally standard education and produce competitive graduates, a curriculum review has been conducted by the university to adhere to the issues pertaining to the changing needs of society at large. The curricular reform aims



to meet changing educational demands, consistency, and progression within, between, and across educational levels and courses, an orderly and systemic process that may avoid unnecessary duplication, and responsible use of resources and materials.

With the abovementioned undertakings, the researchers were prompted to determine the learning readiness level of the learners in education 5.0 as influenced by students' level of value creation and academic productivity wherein the result of this study may serve as a basis for designing a new learning landscape in the academe where the values of sustainability and adaptability are embedded as an essential chunk in the teaching pedagogy.

This study was anchored to the Sustainable Future Triangle postulated by Villarruz (2018) that by principle it is the fourth triangle overpinning the Futures Triangle theory of Inayatullah (2008) where it presents that by the weight of the past, push of the present and pull of the future, lead to a plausible future that is sustainable which defines the sustainable future and development of an organization or institution. Thus, this study looks into the learning readiness level of learners and the levels of value creation and academic productivity of the learners in the education 5.0 era where its implication was utilized as a basis for ascertaining suitable teaching pedagogy.

STATEMENT OF THE PROBLEM

Primarily, this study aimed to determine the learning readiness level of the learners in education 5.0.

Specifically, this research study sought to determine the following:

1. level of value creation of students in education 5.0 era;
2. level of academic productivity of students in education 5.0 era;
3. learning readiness level of the students towards education 5.0; and
4. significant correlation among value-creation, academic productivity, and learning readiness level of students in the education 5.0 era.

HYPOTHESIS

There is no significant correlation among value-creation, academic productivity, and learning readiness level of students in the education 5.0 era.

METHODOLOGY

The descriptive-correlational research design was used in this research study as it determined the learning readiness level of the students of Capiz State University as learners in the education 5.0 era considering value creation and academic productivity as the factors. The independent variables of this study were the value creation and academic productivity of the learners and the dependent variable was the learning readiness level of the learners in the education 5.0 era.

This study has 365 respondents which were determined via sample size computation taken from the total population of 6,930 Higher Education students enrolled at Capiz State University, Roxas City Main Campus during the first semester of the academic year 2021-2022. Random sampling was employed in this study to give an equal chance of being selected as a respondent.

In determining the reliability and validity of the modified questionnaires, pilot testing was made. Upon securing that the questionnaires were reliable and valid, administration of the survey questionnaire among the respondents followed in the form of a google survey.

As to the determination of the level of value creation of the respondents, the researcher used a 12-item modified questionnaire on value co-creation by Ranjan and Read (2016). For academic productivity, the researcher used an 11-item modified questionnaire on co-creation in higher education by Dollinger, Lodge, and Coates (2018). For learning readiness, the researcher used a 20-item modified questionnaire on readiness assessment by Williams (nd). These survey questionnaires underwent content validation and reliability testing since modifications were made. The reliability results of 0.87, 0.79, and 0.82 Cronbach's alpha coefficient for value-creation, academic productivity, and learning readiness respectively were obtained, and it denotes that the survey questionnaires were reliable.

For value-creation and academic productivity, the scale and interpretation of 1.00 – 1.80 are interpreted as “beginning,” 1.81 – 2.61 are interpreted as “developing,” 2.62 – 3.42 are interpreted as “approaching proficiency,” 3.43 – 4.23 are interpreted as “proficient,” and 4.24 – 5.00 are interpreted as “advanced.”

For learning readiness, the scale and interpretation 1.00 – 1.80 are interpreted as “definitely not ready,” 1.81 – 2.61 are interpreted as “probably not ready,” 2.62 – 3.42 “possibly ready,” 3.43 – 4.23 are interpreted as “probably ready,” and 4.24 – 5.00 are interpreted as “definitely ready.”

This study used mean to analyze the descriptive data and Pearson r in the inferential analysis of data set at a 5% level of significance.

**RESULTS AND DISCUSSIONS****On the Level of Value Creation**

The result presented in table 1 reveals that the learners have a proficient (mean = 3.81) level of value-creation underscoring item 4 which says “I felt that the benefits, values, or enjoyment of learning depends on my role and environment” with a mean of 4.02. Also, looking into items 1 and 10 with the lowest mean of 3.67 expressing that “the learning process was a fresh and memorable experience for me” and “I participated in study groups, clubs, or networks that are useful during learning activities.” Thus, the result implies that the learners are able to identify and address the important needs better than any alternatives in their studies however, they still need to be guided and pointed in the direction of where to traverse since confusion is still ubiquitous. Further, in this present education 5.0 era, learners may not be that impeccable in projecting the value creation where the role of the institution as an agent of change walks in, however, the learners manifest a compassionate attitude and positivity in stressful situations by working as a team to complete the learning tasks given. More so, the learners were able to act modestly by respecting one’s perception and were able to prohibit themselves from criticizing things unfairly for they were joined with trustworthiness and each of them extends helped in motivating one another so that they could go further progressively. The result of this study conforms with the findings of Muzira & Muzira (2020) as they revealed that in education 5.0, the thrust remarkably exhibited by taking time to listen and going extra mile to make a difference, one should take ownership for completion and service, very aware that one person cannot do everything, hence, working with others is very vital. Also, being open to other person’s perspectives and being accountable for their own beliefs, ideas and attitudes, and being committed to walking the talk which shapes awareness that trust works both ways.

Table 1. Level of value creation

Value Creation	Mean	Verbal Interpretation
1. The learning process was a fresh and memorable experience for me	3.67	Proficient
2. I felt that learning differed depending on my participation	3.68	Proficient
3. During the learning process, I was able to do something useful for me by challenging new things	3.82	Proficient
4. I felt that the benefits, values, or enjoyment of learning depends on my role and environment	4.02	Proficient
5. During the learning process, the professor tried to meet the individual needs of each student	3.77	Proficient
6. During the learning process, I felt that participation in learning activities varied depending on my taste and knowledge	3.84	Proficient
7. The learning process provided a good overall learning experience beyond functional benefits	3.89	Proficient
8. I felt that the university needed related promotional activities for students to be completely immersed in learning activities	3.82	Proficient
9. During my learning activities, I felt an intimate relationship with my major	3.85	Proficient
10. I participated in study groups, clubs, or networks that are useful during learning activities	3.67	Proficient
11. During the learning activities, I felt that my relationship with my major or professor could be improved depending on the word of mouth on social media that students use a lot	3.87	Proficient
Grand Mean	3.81	Proficient

Legend	Scale	Description
	1.00 – 1.80	Beginning
	1.81 – 2.61	Developing
	2.62 – 3.42	Approaching Proficiency
	3.43 – 4.23	Proficient
	4.24 – 5.00	Advanced

On the Level of Academic Productivity

The level of academic productivity of the learners as presented in table 2 shows proficient level due to the computed mean of 3.73, highlighting item number 11 with a mean of 3.87 which entails that “I and the professor interacted sufficiently during the learning process” and looking into the enhancement of item number 7 which says “I thought my role was important in the learning process” with a mean of 3.50. Thus, the result implies that the learners are capable of demonstrating the soft skill or personal strength that is learned through education or training, and this personal strength that the learners were exhibiting was developed by familiarization with common issues and rationalizing using the theories, content, and context learned. More so, with



the presented result, it is further explained that the learners devote study time and had created specific goals to be guided in the learning endeavor. They also have to do list for their guidance, practice note taking, organizing review notes, and run-through details with other supplemental learning materials. The result of this study conforms with the article published by The Patriot (2019) which reveals that integrating industrial issues in the learning endeavor of students and providing a detailed landscape in the learning process contributes to effective learning.

Table 2. Level of Academic Productivity

Academic Productivity	Mean	Verbal Interpretation
1. The professor was open to my ideas and suggestions for existing or new learning content	3.85	Proficient
2. The professor provided enough explanation and information for me to learn	3.60	Proficient
3. I was willing to spend my time and effort sharing my ideas and suggestions for learning with the professor	3.67	Proficient
4. The professor provided an appropriate environment and opportunity to provide my suggestions and ideas	3.82	Proficient
5. I could easily access the learning content according to my interest level	3.85	Proficient
6. The learning content provided was consistent with my learning needs	3.67	Proficient
7. I thought my role was important in the learning process	3.50	Proficient
8. The professor and I used the best communication channels to share learning results	3.80	Proficient
9. I was able to express my needs conveniently during the learning process	3.71	Proficient
10. The professor gave me enough information related to learning	3.63	Proficient
11. I and the professor interacted sufficiently during the learning process	3.87	Proficient
12. During the course of learning, I played an active role in interacting with professors to get the most out of my knowledge	3.85	Proficient
Grand Mean	3.73	Proficient

Legend	Scale	Description
	1.00 – 1.80	Beginning
	1.81 – 2.61	Developing
	2.62 – 3.42	Approaching Proficiency
	3.43 – 4.23	Proficient
	4.24 – 5.00	Advanced

On Learning Readiness Level of Learners in Education 5.0

The result of the learning readiness level of learners in education 5.0 is shown in table 3 which reveals a mean of 3.75 which is verbally interpreted as “probably ready” emphasizing item number 7 with a mean of 3.86 which entails that “I learn best when I figure things out for myself” and taking into consideration item number 17 with a mean of 3.50 saying “I am comfortable installing software and changing configuration settings on my computer.” The result implies that learners are able to cope with the present learning modalities and educational system which most of it is associated with technology use. However, the learners in Education 5.0 shows a need for enhancement with the guidance of their parents and teachers to teach and assist learners in identifying ways to use technology safely and only where it truly adds value since at present, there are growing pieces of evidence pointing to the disadvantages of technology on physical and mental health, as well as on motivation to learn among learners and the value of the actual learning performance seems to regress. The result of this study conforms with the findings of Dervojeda (2021) which reveals that education 5.0 is not about less or more technology but it is about making conscious, responsible choices while seeing the bigger picture and it pays special attention to the aspects of privacy, ethics, safety, and technological mindfulness.

**Table 3. Learning Readiness Level of Learners in Education 5.0**

Learning Readiness	Mean	Verbal Interpretation
1. I am good at setting goals and deadlines for myself.	3.85	Probably Ready
2. I do not quit just because things get difficult.	3.80	Probably Ready
3. I can keep myself on track and on time.	3.84	Probably Ready
4. I learn relatively easily.	3.71	Probably Ready
5. I can learn from things I hear, like lectures, audio recordings, or podcasts.	3.77	Probably Ready
6. I have to read something to learn it best.	3.72	Probably Ready
7. I learn best when I figure things out for myself.	3.86	Probably Ready
8. I like to learn in a group, but I can learn on my own as well.	3.82	Probably Ready
9. I usually study in a place where I can read and work on assignments without distractions.	3.76	Probably Ready
10. I can ignore distractions around me when I study.	3.81	Probably Ready
11. I keep a record of what my assignments are and when they are due.	3.85	Probably Ready
12. I plan my work in advance so that I can turn in my assignments on time.	3.60	Probably Ready
13. I am willing to use e-mail and other online tools to ask my classmates and instructors questions.	3.67	Probably Ready
14. I am relatively good at using the computer.	3.82	Probably Ready
15. I am comfortable surfing the internet.	3.85	Probably Ready
16. I am comfortable conducting searches, setting bookmarks, and downloading files.	3.67	Probably Ready
17. I am comfortable installing software and changing configuration settings on my computer.	3.50	Probably Ready
18. I have word processing and spreadsheet software, such as Microsoft Word and Excel.	3.80	Probably Ready
19. I have broadband access to the Internet with a fast and reliable connection.	3.71	Probably Ready
20. I have headphones or speakers and a microphone to use if a class has a video conference.	3.63	Probably Ready
Grand Mean	3.75	Probably Ready

Legend	Scale	Description
	1.00 – 1.80	Definitely Not Ready
	1.81 – 2.61	Probably Not Ready
	2.62 – 3.42	Possibly Ready
	3.43 – 4.23	Probably Ready
	4.24 – 5.00	Definitely Ready

Correlation among Value Creation, Academic Productivity, and Learning Readiness

The result of the correlation among value creation, academic productivity, and learning readiness was presented in table 4 which reveals that there were strong positive correlations between value creation and academic productivity ($r=.876$), value creation and learning readiness ($r=.922$) and academic productivity and learning readiness ($r=0.971$) and value creation, academic productivity and learning readiness were significantly correlated with each other ($\text{sig.} = 0.000$). The result implies that value creation and academic productivity were of great influence on the achievement of the learners which may consider underlying factors in determining one's learning readiness.

Table 4. Correlation among value creation, academic productivity and learning readiness

	N	Pearson Correlation	Sig. (2-tailed)	Remarks
Value creation & Academic Productivity	365	.876**	.000	Significant
Value creation & Learning Readiness	365	.922**	.000	Significant
Academic Productivity & Learning Readiness	365	.971**	.000	Significant

** . Correlation is significant at the 0.01 level (2-tailed).



CONCLUSIONS

1. The level of value creation was determined as “proficient” which entails students were capable to align themselves in the global academic arena seeking minimal guidance from teachers or even from other individuals for validation.
2. The level of academic productivity was determined as “proficient,” therefore, students adopted the learning modalities via digital deliberation and were adept to fill the gap in the learning mechanism of today’s trend however noting that supervision among teachers was still needed among students to place a clearer pathway towards success.
3. The learning readiness level of the students towards education 5.0 was determined as “probably ready” which shows that students were prepared to fish out and process learning on their own, yet progressive learning to be excellent is still pursued among students where the need of supervision from teachers are needed.
4. Inferentially, there are significant correlations among value creation, academic productivity, and learning readiness of learners in the education 5.0 era which entails that students’ learning readiness is influenced by value creation and academic productivity.

RECOMMENDATIONS

It is recommended that teachers may enhance the collaborative-based measurement of learning tasks to fully equip the student’s potential. Moreover, they are also encouraged to develop a well-structured learning pathway and learning materials where students could take ideas on how to further advance their skills. In terms of learning readiness in this education 5.0 era, it is recommended that active participation in seminars, workshops, and fora presenting trends and global competitiveness are encouraged to provide a breakthrough among the learners and teachers to enhance their knowhow of the relevant and responsive competencies.

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EXPLORING THE SCIENTIFIC SKILLS AND LEARNING STYLES OF FUTURE SCIENCE MENTORS: A SPRINGBOARD IN ENGAGING EFFECTIVE SCIENCE TEACHING PEDAGOGY

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ABSTRACT

Fundamental competencies, skills, and styles of learning among students are the basis of planning an effective teaching-learning activity. Since most of the enrollees in the Bachelor of Secondary Education major in Science were graduates of non-Science, Technology, Engineering and Mathematics (STEM) strand, there is a must to address the gap between the student's competencies and skills from their chosen field by identifying their level of scientific skills and learning styles to effectively meet the demand of the mandated competencies in the major courses offered in the aforesaid program. In this study, the level of scientific skills and its components and the learning style of future science mentors were determined together with the correlation between the level of scientific skills and learning style. The research instrument used in this study was the researcher-made questionnaire for scientific skills which was subjected to reliability and validity testing and an adopted survey questionnaire developed by Kolb (1984) for learning style. Thus, it was determined that future science mentors as an entire group possess a "proficient" level of scientific skills and in terms of scientific inquiry and practical skills, both were determined as "proficient" in terms of processing data, it was determined as a "developing" level. Also, the learning style of future science mentors was an "activist" style of learning. A significant relationship was determined between the level of scientific skills and the learning style of future science mentors with a medium positive correlation. This study as well concluded that social constructivism and pragmatism science teaching pedagogies were the best-fit pedagogies among future science mentors in designing their learning landscape which the researchers recommend among science professors to be the reference in formulating effective strategies and learning activities to efficiently and effectively transfer learnings among their students.

KEYWORDS: *Competencies, Experiential Learning, Learning Style, and Scientific Skills*

INTRODUCTION

Attaining intended learning outcomes among students is the most crucial task of teachers, from planning from scratch on what teaching and learning activity would be effective among learners and addressing the individual differences are the most painstaking part of designing a syllabus for the course during the semester.

In the case of the Bachelor of Secondary Education major in Science at Capiz State University – Roxas City Campus, it is observed that most of the enrollees are non-Science, Technology, Engineering, and Mathematics (STEM) strand graduates in their secondary education and obviously it shows that the fundamental competencies and skills required of the Bachelor of Secondary Education major in Science program are perhaps far-off from the demand of the mandated competencies in the major courses offered in the aforesaid program.

As future Science mentors, the respondents are expected to characterize scientific skills which according to Stein et al. (2001), it is the ability to use scientific knowledge to identify questions that can be answered through a scientific process and draw conclusions based on facts. Scientific skills are the basic skills of facilitating learning in science, allowing students to be active, developing a sense of responsibility, increasing the permanence of learning, and providing research methods (Ertuk and Kaptan, 2010). More so, it is the building block of critical thinking and inquiry in science that can be obtained through science instruction and activity (Bagaloyos, 2017) carried out by teachers with sufficient scientific skills to efficiently guide their students to perform science processes effectively (Miles, 2010). However, teaching scientific skills among those future science mentors may not be effective



enough in utilizing a one-size-fits-all learning strategy. Basically, they may learn in many ways depending on their learning style. Learning style refers to the concept that individuals differ in regard to what mode of instruction or study is most effective for them and it classifies students according to where they fit on a number of scales pertaining to the ways they receive and process information (Pashler et al., 2009).

In order to effectively meet the intended learning outcomes of the major courses and the competencies embedded in the aforementioned program, and to address the mandate of catering graduates of the Kto12 program regardless of what track and strand the student finish, it is a must to build the bridge of connectivity and address the gap in their chosen field by identifying the level of scientific skills and their learning styles.

This study was anchored on the transformative learning theory postulated by Mezirow (1991) that in principle, personal experience is an integral part of the learning process. It suggests that a learner's interpretation of the experience creates meaning, which leads to a change in behavior, mindset, and beliefs. When transformational learning occurs, a learner may undergo a paradigm shift that directly impacts future experiences.

STATE OF THE PROBLEM

Primarily, this study aimed to determine the level of scientific skills and the learning style of future Science mentors.

Specifically, this study sought to answer the questions:

1. What is the level of the scientific skills of future science mentors as an entire group and according to scientific inquiry, processing data, and practical skills?
2. What is the learning style of future science mentors?
3. Is there a significant relationship between the level of scientific skill and the learning style of future science mentors?
4. What science teaching pedagogy can be recommended to improve the scientific skills of future science mentors vis-à-vis their learning style?

HYPOTHESIS

There is no significant relationship between the level of scientific skill and the learning style of future science mentors?

METHODOLOGY

This study used the descriptive correlational research design to determine the scientific skills level and the learning style of future Science mentors of Capiz State University – Roxas City Campus. The respondents of the study were the 84 randomly selected future Science mentors out of 106 who were enrolled in the Bachelor of Secondary Education major in Science program. The sample size was determined using Slovin's formula. Simple random sampling was employed in determining the respondents of the study.

The responses of the future Science mentors among the benchmarks pertaining to scientific skills and learning style were gathered using a researcher-made questionnaire for scientific skills and an adopted questionnaire developed by Kolb (1984) for learning style.

This involves quantitative research focusing on the gathered data for analysis. This was conducted at Capiz State University – Roxas City Campus during the first semester of the academic year 2019 – 2020.

The researcher formulated a 15-item survey questionnaire in determining the scientific skills level of the respondents encompassing the factors of scientific inquiry, processing data, and practical skills. For learning style, this study used an adopted questionnaire developed by Kolb (1984). Content validation and reliability test were employed on the questionnaire for Scientific Skills which was a researcher-made questionnaire. The content validation was done by subjecting the researcher-made questionnaire to scrutiny among five Science Professors and the reliability testing was conducted among 30 randomly picked future Science mentors, it obtained a Cronbach's alpha coefficient of 0.838 which indicates that the research instrument has good reliability.

Mean and standard deviation was used to analyze the responses of the respondents as to their scientific skills level. The scientific skills level was interpreted as Advanced (4.21-5.00), Proficient (3.41-4.20), Developing (2.61-3.40), Emerging (1.81-2.60), and Beginning (1.00-1.80) and as to the learning style of the respondents, rank analysis was employed. Inferentially, Pearson's moment of correlation was used to find out the relationship between variables which was set at 0.05 level of significance.

RESULTS AND DISCUSSIONS

On the Level of Scientific Skills of Future Science Mentors

The gathered data shows that the scientific skills level of the future Science mentors was "proficient". Considering the factors of scientific inquiry, processing data, and practical skills, the result showed that future Science mentors were "proficient" in terms of scientific inquiry and practical skills, and have a "developing" level in processing data. This implies that future science mentors were ready to deal with the science courses offered in the BSED Science curriculum considering that they have prior knowledge on how to



conduct experimentation, and ensure safety precautions in dealing with the scientific undertaking, however, it is underscored that they need to improve their skills in making calculations and measurements utilizing apparatuses, and in presenting data. More so, the need for supplementary learning and further reinforcement to attain mastery of scientific skills was evident. The result of this study conforms with the findings of Ngoh (2008) that science process skills form the core of inquiry-based learning wherein to learn to do science is to master the science process skills and apply them in a scientific investigation.

Table 1: Level of Scientific Skills of Future Science Mentors

Scientific Skills	Mean	Verbal Interpretation
Scientific Inquiry	3.96	Proficient
Processing Data	3.21	Developing
Practical Skills	3.66	Proficient
Grand Mean	3.45	Proficient

On Scientific Inquiry of Future Science Mentors

In terms of Scientific Inquiry, the result reveals that future science mentors were “proficient.” All of the items as well were scored as “proficient,” however, taking into consideration the mean scores, item number 5 entails “writing a simple method that can be followed in experimentation” scored lowest among the five. This implies that future science mentors were able to make use of evidence be it tangible evidence or part of the experience in conceptualizing predictions and inferences by recognizing the order in which sequenced events take place, they can also report events systematically written or verbal. However, the need for a thorough presentation on how to draw methodology should be considered. The result of the study affirms the findings of Ling and Towndrow (2005) which reveals that the acquisition of an effective mastery of scientific skills was through manipulative and procedural instructions to enable students to understand the tasks they are carrying out on their level.

Table 1a: Scientific Inquiry of Future Science Mentors

Scientific Inquiry	Mean	Verbal Interpretation
1. Writing a hypothesis and justifying it using scientific reasoning.	3.98	Proficient
2. Making predictions for an experiment based on the aim and variables.	3.98	Proficient
3. Making and recording accurate observations from a range of experiments.	3.99	Proficient
4. Identifying variables and describing how they can be manipulated to ensure the validity of results.	3.98	Proficient
5. Writing a simple method that can be followed in experimentation.	3.87	Proficient
Grand Mean	3.96	Proficient

On Processing Data of Future Science Mentors

As to the processing data, the result discloses that future science mentors have a “developing” level that emphasizes item number 1 and 4 revealing that students can identify inconsistent results and were able to draw appropriate results tables for any given method. However, it was also revealed that future science mentors have an “emerging” level underpinning items 2 and 3 that shows future science mentors were challenged in “using the standard form in calculating results” and “calculating simple units using a formula.” The result implies that future science mentors can work with a degree of precision appropriate to the task and be able to compare and comprehend experimental results but were challenged in terms of using appropriate measures and computations. The result of the study was supported by the findings of Rodriguez (2010) who asserted that to make an effective interpretation of concrete results, students’ basic and practical understanding is demanded.

**Table 1b: Processing Data of Future Science Mentors**

Processing Data	Mean	Verbal Interpretation
1. Identifying inconsistent results.	4.02	Proficient
2. Using the standard form in calculating results.	2.06	Emerging
3. Calculating simple units using a formula.	2.06	Emerging
4. Drawing an appropriate results table for any given method.	4.02	Proficient
5. Inferring on how the percentage error affects the confidence of a conclusion.	3.87	Proficient
Grand Mean	3.21	Developing

On Practical Skills of Future Science Mentors

The practical skills of future science mentors were determined as “proficient” highlighting item number 3 disclosing that “collecting and selecting the correct equipment safely and calmly” was very evident, however, item number 4 was an emerging concern since future science mentors professed that “working successfully as a practical pair” was not amenable to them. Thus, the result implies that future science mentor has the competence in handling and manipulating materials with safety and efficiency, they can work with a degree of precision appropriate to the task, and they can as well conceptualize and infer by simply looking into the sequence of events that took place. However, there was a need to develop their sense of fellowship to be able to work with others effectively and efficiently, they should learn to act modestly by respecting one’s perception and prohibit themselves from criticizing things unfairly, instead work as a team with dependability and decency so that they could go further progressively. The result of this study affirms the result presented by Martin (2009) revealing that in learning skills, one should undergo a process of continually refining existing knowledge and constructing concepts in intricate organized networks.

Table 1c: Processing Data of Future Science Mentors

Practical Skills	Mean	Verbal Interpretation
1. Demonstrating skillful technique when using basic measuring equipment.	3.98	Proficient
2. Following an experimental method successfully.	4.02	Proficient
3. Collecting and selecting the correct equipment safely and calmly.	4.25	Advanced
4. Working successfully as a practical pair.	2.07	Emerging
5. Performing practical tasks with little teacher guidance in obtaining concordant results.	4.00	Proficient
Grand Mean	3.66	Proficient

On Learning Style of Future Science Mentors

The learning style of science future mentors revealed that they were “activist” learners and least to be “theorists”. Thus, the result implies that these future science mentors perform well on practical tasks but were inattentive to theories because their learning style aligns with the emphasis on new experiences as they focus on the present scenario and doing such activities as games, problem-solving, and simulations. They are into a lot of practical and hands-on work which can lead them to generate novel ideas. More so, they are equipped on responding to challenges and take risks. On the other hand, they can learn, too, through other ways but not as effective as the aforementioned style of learning, and these other ways are by exploring methodologies through logical and rational points of view. Also, they can learn through experimentation but they prefer that material was directed towards the techniques that make their work easier since they practice what they have learned from what they read. The result of this study conforms with the findings of Bhatnagar and Sinha (2018) which discloses that students in today’s generation enjoy the here and now and are happy to be dominated by immediate experiences since they are open-minded, but not skeptical, and this tends to make them enthusiastic about anything new.

**Table 2: On Learning Style of Future Science Mentors**

Scientific Skills	Mean	Rank
Activist	3.62	1 st
Theorist	3.34	4 th
Pragmatist	3.43	3 rd
Reflector	3.51	2 nd

On Correlation of Scientific Skills and Learning Style of Future Science Mentors

The correlation test between the scientific skills and learning style of future science mentors revealed that there was a medium positive correlation and exhibited a significant relationship. The result implies that the scientific skills level was influenced by the instructional strategies that fit the learning style. The result of the study conforms with the findings of Aboe (2018) that there was a positive influence between learning styles and student academic achievement and the same findings were disclosed by Magulod (2019) that there were significant relationships between learning styles, study habits and academic performance of students in applied science courses.

Table 3: On Correlation of Scientific Skills and Learning Style of Future Science Mentors

Variables	Pearson Correlation	Significance (2-tailed)	Remarks
Scientific Skills and Learning Style	0.455**	0.000	Significant

***.* Correlation is significant at the 0.01 level (2-tailed).

**On the Science Teaching Pedagogy
Recommended in Improving the
Scientific Skills of Future Science Mentors
vis-à-vis their Learning Style**

The Science teaching pedagogies considered out from the aforementioned results of this study were the social constructivism underlining future science mentors' experience, personalization, and relationship and pragmatism underscoring the mastery, valuation, and interaction. These two science teaching pedagogies drive evident learning acquisition and high learning retention that fits their learning styles.

CONCLUSIONS

1. Future science mentors as an entire group possess a "proficient" level of scientific skills. Overpinning its components, their scientific inquiry was determined as "proficient" level, processing data were determined as "developing" level, and practical skills were determined as "proficient" level. Therefore, it was viewed that they were able to deal with the science courses offered under the BSEd Science curriculum for they embody the needed fundamental skills.
2. The learning style of future science mentors was an "activist" style of learning wherein it regards that they can easily acquire learning through experiential learning activities.
3. There was a significant relationship between the level of scientific skills and the learning style of future science mentors with a medium positive correlation.
4. Social constructivism and pragmatism science teaching pedagogies were the best-fit pedagogies among future science mentors in designing their learning landscape to drive evident learning acquisition and high learning retention.

RECOMMENDATIONS

It is recommended that advanced scientific skills enhancement be designed in the teaching of science where learning tasks conform with scientific inquiry, processing data, and practical skills to develop an advanced level of scientific skills among future science mentors. Further, the practice of an activist learning landscape is recommended to greatly engage future science mentors in acquiring learning and building greater knowledge retention. Lastly, science professors may use social constructivism and pragmatism in science teaching pedagogies in formulating effective strategies and learning activities to efficiently and effectively transfer learnings among their students. Also, the result of this study encourages them as well to be kept abreast of the constantly changing demands of how science disciplines should be taught in such ways that future science mentors may cope.



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ON THE PROBLEM OF EVALUATING THE EFFECTIVENESS OF THE WORK OF DIRECTORS OF SECONDARY SCHOOLS IN THE REPUBLIC OF UZBEKISTAN

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ABSTRACT

The research raises the problem of evaluating the effectiveness of directors of secondary schools in the Republic of Uzbekistan, substantiates the importance of evaluating the effectiveness of school directors. The purpose of the research is to develop proposals and recommendations for evaluating the effectiveness of the work of directors of secondary schools. In the theoretical part of the research, the analysis of scientific and methodological literature on the problem of the elaboration of the content and criteria for evaluating the effectiveness of the work of directors of secondary schools. The directors of secondary schools of the Republic of Uzbekistan attended the research. The results obtained provide a basis for evaluating the effectiveness of the work of directors of secondary schools.

KEYWORDS: director, secondary school, effectiveness of directors of secondary schools.

INTRODUCTION

In the development strategy of New Uzbekistan, the goal is to improve the quality of education in schools and raise the knowledge and qualifications of teaching staff to the international level. The key figure on which the effectiveness of the educational reforms carried out by the school depends, the purpose of which is to improve the quality of education, is the director of the school. The competitiveness of the school, the results of the school's activities depend on how professionally the management is organized, whether the priorities are chosen correctly. Thus, today the innovative development of the education system makes it necessary to train competent managerial personnel with creative potential.

In recent years, systematic work has been carried out in the country to improve the quality and efficiency of the education and upbringing system, special attention is paid to the problem of evaluating the effectiveness of the work of directors of secondary schools. The Decree of the President of the Republic of Uzbekistan "On approval of the National Program for the development of public education in 2022-2026" defines the task of introducing into practice the assessment of knowledge and skills of candidates for the position of school director and the results of issuing them a manager certificate [3]. In this regard, the topic of the research aimed at assessing the effectiveness of the work of directors of secondary school is important.

The purpose of the research is to develop proposals and recommendations for evaluating the effectiveness of the work of directors of secondary schools.

This research is aimed at achieving the following objectives:

- To analyze the work on evaluating the effectiveness of school principals;
- To determine the criteria for evaluating the effectiveness of the work of directors of secondary schools

LITERATURE REVIEW

1.1. Professional and managerial activity of the director of a secondary school

The problem of developing the human resources potential of the public education system is also outlined in the Decree of the President of the Republic of Uzbekistan No. DP-134 dated May 11, 2022. The Development Program indicates the need to form a national personnel reserve by posting on a special electronic portal information about the current and prospective demand for personnel, as well as vacant positions in the context of institutions of general secondary education and school subjects [3].



The professional and managerial activity of the director of a secondary school is conditioned by the complex nature of the implementation of administrative, strategic, expert advisory, representative, pedagogical, innovative and disciplinary tasks, as well as the conditions for its implementation in modern society [11, p. 46].

V.Y.Krichevsky writes: "one of the leading factors determining the meaning, content and vector of school development is the head himself" [6, p.73]. Thus, the evaluation of the effectiveness of the director's activities directly affects the evaluation of the effectiveness of the educational institution.

In the Qualification requirements for the leading personnel of public education [7], the following competencies are identified:

- General:
 - 1) Development of communication skills;
 - 2) Information and communication technologies and media literacy in management;
 - 3) Self-development, continuous professional development;
 - 4) Responsibility and flexibility in management;
 - 5) Issues of implementation of inclusive education;
 - 6) Legal issues in management;
- Private:
 - 7) Education management;
 - 8) Financial and economic issues in management.

From January 1, 2023, in the Republic of Uzbekistan, candidates for the position of school director for obtaining a manager certificate are trained in teamwork skills, dialogue with parents, management, financial calculations and information and communication technologies at the National Research Institute for special paid programs.

An analysis of the studies of N.A. Bozin, N.M. Savina [2], I.A.Savchenko [9], V.Yu.Krichevsky [6] showed that today the director of a secondary school is not only a manager, but also a psychologist, economist, innovator. The director of the school must build relationships with all subjects of the educational process (teaching staff, students, parents), also the director of the school must be able to attract additional sources of funding, maintain the status of the school, cooperate with international organizations, properly conduct personnel policy, should inspire and motivate the teaching staff and parents of students to achieve optimal results of students, introduce new information technology and other.

1.2. Evaluation of the effectiveness of the work of directors of secondary schools

Evaluating the effectiveness of the work of directors of secondary school is an extremely difficult issue.

In the course of the research, the literature on the problem of assessing the professional and managerial activities of directors of secondary schools was analyzed, in particular

Volkov V.N., Grishina I.V. [4] – identified the author's approach to assessing the effectiveness of the school head's managerial activities.

Vlachopoulos D., Pitsiavas D. [12] investigated the issues of achieving effective education management using ICT.

Zazykin V.G., Smirnov E.A., Sinyagin Yu. [10, 13] investigated the methodology of assessing the managerial potential of managers.

Glebova G. F., Alexandrova D. N. [5] studied teachers' ideas about an effective head of a modern general school.

Bakhtin M. B., Dovbysh S. E., Arinushkina A. A [1] described modern approaches and principles of measuring the effectiveness of educational organizations.

Scientific approaches to assessing the professional and managerial activities of directors of secondary school focus on two main aspects:

- Determination of the structural elements of its content and their evaluation;
- Identification and recording of key effectiveness indicators, performance [4].

The Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 345 dated 03.06.2021 "On measures to determine the rating of general education and secondary specialized educational institutions" defines the following criteria for determining the rating of general education institutions:

1. The level of preparedness and quality of education of graduates of general education institutions in general education subjects
 - 1.1. The level of educational readiness of graduates in general education subjects (based on the scores received by graduates of the 11th grade upon admission to higher education institutions)
 - 1.2. The level of quality of education of graduates (based on the weight of those enrolled in universities among graduates of 11th grades)
2. Indicator of the level of knowledge of students of a general secondary educational institution
3. Indicator of the level of foreign language proficiency of students of a general education organization
4. Indicator of the quality (competence) of teachers of a general education organization
5. Indicator of the level of foreign language proficiency of students of a general education organization
6. Results of the social survey



7. Spiritual, educational and educational environment in a general educational institution (based on the work carried out within the framework of five initiatives put forward by the President of the Republic of Uzbekistan) [8].

METHODOLOGY (Font size of heading 12 Bold in Capital Letters, Times New Roman)

The studied foreign experience on the problem of research, as well as the legislative acts of the Republic of Uzbekistan on the problem of research, allowed us to conduct a research to determine the criteria for evaluating the effectiveness of the work of directors of secondary schools.

A research to determine the criteria for a transparent and fair assessment of the effectiveness of the work of directors of secondary schools of the Republic of Uzbekistan was held in July 2022 by the National Research Institute for Professional Development and Training of Teachers in New Methods named after A. Avloni within the framework of the project "Portal for the formation of a reserve of teachers and school principals"

The respondents in the research were female and male directors of secondary schools of the Republic of Uzbekistan with professional and managerial experience from 1 year to 30 years. The sample consisted of 1,134 school principals.

RESULTS AND DISCUSSION

To determine the criteria for evaluating the effectiveness of the director of secondary school, a questionnaire was conducted in the following areas:

- Evaluation of the effectiveness of achievements during the leadership;
- Evaluation of the effectiveness of professionalism;
- Evaluation of the effectiveness of innovation activities.

Below we present the results of the analysis of respondents' answers (Table1):

Table1. Results of the analysis of respondents' answers

What parameters do you consider the most important for evaluating the performance of the director of a secondary school		
Participation of students in the district (city) stage of the Olympiad in science and competitions of the republican level	697	63%
Results of student participation in festivals and competitions (5 initiatives)	655	59,20%
Competition "The most prosperous school" (district, region, republic)	430	38,80%
Average skill level of students % (kundalik.com)	633	57,20%
Admission rate of graduates to higher education institutions	665	60,10%
Evaluation of the director's work by members of the supervisory board and parents (based on the questionnaire)	622	56,20%
Participation of the teaching staff of the general education school in the Republican Olympiads, competitions (competition "Teacher", Olympiad, etc.)	501	45,30%
The best choice of schools for teaching foreign languages	428	38,70%
Coverage of school activities in the media and on websites	619	55,90%
Promotion of the director's leadership experience (school, district, region, republic)	515	46,50%
Mark the necessary criteria in the direction of professional self-development.		
Management Certificate (via Action Center)	504	44,50%
National or equivalent internationally recognized certificate of the appropriate level	412	36,40%
Additional training courses (international, national, etc.)	769	67,90%
Which of the following criteria for innovative and entrepreneurial activity of the school principal do you consider the most priority		
Participation in various projects (republic, region)	496	43,80%
Fundraising outside the budget (marketing)	569	50,20%
Cooperation with international organizations	346	30,50%
The indicator of the quality of the teaching staff (number of teachers of the highest and first category)	928	82%

The average by category is presented in table 2.

**Table 2. Category average**

What parameters do you consider the most important for evaluating the performance of the director of a secondary school	52%
Mark the necessary criteria in the direction of professional self-development.	49,60%
Which of the following criteria for innovative and entrepreneurial activity of the school principal do you consider the most priority	51,60%

In the course of studying the literature on the research problem, it is possible to present criteria for determining the evaluation of the effectiveness of the work of directors of secondary school. The analysis of the selected criteria allows you to form them into groups:

- The first group collects information in the direction of the professionalism of the director of a secondary school;
- The second group collects information in the direction of achieving results during the leadership of the school;
- The third group contains information in the direction of professional self-development.
- The fourth group contains information in innovation activities. (Table 3)

Table 3. Evaluation of the effectiveness of the work of directors of secondary schools

Professionalism of the director	Achievement of results during the leadership of the school	Professional self-development	Innovative activity
<ul style="list-style-type: none"> • Leadership experience • Qualification category • Training on the website uzlms.uz and onlinedu.uz • Availability of state awards • Are members of people's deputies of republican, regional, city, district councils or other elected bodies 	<ul style="list-style-type: none"> • Participation of a student in the district (city) stages of Olympiads in science and competitive Olympiads of the republican level • Results of students' participation in festivals and competitions. 5 initiatives • Competition "The most prosperous school" • Student skill level % (kundalik.com) • Acceptance rate of graduates in higher education institutions • Evaluation of the director's work by members of the supervisory board and parents • Participation of pedagogical workers of a general education school in the Republican Olympiads (competition "Teacher", etc.) • The best choice of school for teaching foreign languages • "Coverage of the school's activities in the media • "Publication of the experience of managing a director 	<ul style="list-style-type: none"> • Certificate of Management "Gold Fund • Internationally recognized national or equivalent level certificate • Refresher courses (according to national and international educational programs and courses), work within the framework of self-development (online courses in the specialty) 	<ul style="list-style-type: none"> • Participation in the project • Fundraising outside the budget (marketing) • Established cooperation with international organizations • The indicator of the quality of teaching staff (from among teachers of the highest and first category)



CONCLUSIONS

In the course of the research, the problem of evaluating the effectiveness of the director of a secondary school was studied and analyzed, as well as the parameters for evaluating the effectiveness of the director of a secondary school, grouped into four categories, were determined:

- Professionalism of the director of a secondary school;
- Achievement of results during the leadership of the school;
- Professional self-development
- Innovative activity.

The practices of evaluating the effectiveness of directors of secondary schools are different: professional competitions for directors, certification of directors, the level of preparedness and quality of education of graduates, the indicator of the level of proficiency in foreign languages, and others. Professional competitions can be considered as an opportunity to evaluate the effectiveness of the most motivated and successful directors of secondary schools, since it is these managers who most often take part in them, at the same time, the qualification category and assessment within the framework of professional development are massive.

The approach to assessing the effectiveness of the work of the directors of secondary schools cannot be "one-dimensional" due to the peculiarities of this activity itself in modern conditions - the ever-increasing complexity of the tasks being solved.

The results obtained provide a basis for evaluating the effectiveness of the work of directors of secondary schools.

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PROJECT-BASED LEARNING (PBL): PATHWAY TO DEVELOP THE MAPEH SKILLS OF GRADE 9 STUDENTS OF BAUTISTA NATIONAL HIGH SCHOOL (BNHS)

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ABSTRACT

Project-Based Learning (PBL) is a teaching method in which students learn by actively engaging in real-world and personally meaningful projects. Students work on a project over an extended period from a week up to a semester that engages them in solving a real-world problem or answering a complex question. They demonstrate their knowledge and skills by creating a public product or presentation for a real audience. As a result, students develop deep content knowledge as well as critical thinking, collaboration, creativity, and communication skills. It releases contagious, creative energy among students and teachers.

This study determined the influence of Project-Based Learning (PBL) in developing the Research skills of MAPEH Grade 9 Students of Bautista National High School (BNHS). Specifically, it sought to answer the following sub-questions: What is the performance level of the students in the diagnostic test in MAPEH? What are the common problems faced by the students in MAPEH? What action plan can be proposed to develop the research skills of Grade 9 students? What is the performance level of Grade 9 students in the summative test in MAPEH? Is there a significant relationship between the performance of the Grade 9 students on the diagnostic and summative test?

The participants in this study were the Grade 9 students of Bautista National High School, Division of Pangasinan II. A total of 1,525 Grade 9 students were involved in the study, selected and determined by using Slovin's formula at a .05 level of error. The following data analysis was used, the frequency counts and percentage distribution, the analysis of variance (ANOVA), and the measures of central tendencies such as mean and median.

The performance of the students in the diagnostic test conducted is below the average. The common problems faced by the students in MAPEH were the following: Formulation of problem / or writing a valid and reliable problem. Formulation of the conceptual framework. Formulation of valid gathering tools. Application of the correct statistical method

The action plan proposed in this study that focused on Project-Based Learning (PBL) improved the performance of the Grade 9 students and enhanced their MAPEH skills. There is a greater improvement in the performance of the students in the summative test conducted in MAPEH. There is a significant relationship between the performance of the Grade 9 students on the diagnostic and summative tests.

Based on the findings, analysis, and results of the study the following recommendations are hereby advanced: Teachers should conduct a diagnostic test in research to determine the skills needed by the students. This will help the teachers and the school heads to have a pre-planning of the appropriate teaching methodology and instructional materials. The action plan proposed in this study should be widely used by the division office to have a data bank of information for further research and test of effectiveness. The use of PBL as a teaching approach to develop the MAPEH skills of the Grade 9 students should be tested using another variable to sustain its effectiveness.

KEYWORDS: *teaching and learning, project based learning, teaching strategies and teaching methods*

I. INTRODUCTION

Project-Based Learning (PBL) is a teaching method in which students learn by actively engaging in real-world and personally meaningful projects. Students work on a project over an extended period from a week up to a semester that engages them in solving a real-world problem or answering a complex question.

They demonstrate their knowledge and skills by creating a public product or presentation for a real audience. As a result, students develop deep content knowledge as well as critical thinking, collaboration, creativity, and communication skills. It releases contagious, creative energy among students and teachers.



II. OBJECTIVES/RESEARCH QUESTIONS

This study determined the influence of Project-Based Learning (PBL) in developing the Research skills of MAPEH Grade 9 Students of Bautista National High School (BNHS). Specifically, it sought to answer the following sub-questions:

1. What is the performance level of the students in the diagnostic test in MAPEH?
2. What are the common problems faced by the students in MAPEH?
3. What action plan can be proposed to develop the research skills of Grade 9 students?
4. What is the performance level of Grade 9 students in the summative test in MAPEH?
5. Is there a significant relationship between the performance of the Grade 9 students on the diagnostic and summative test?

III. POPULATION/SAMPLE/PARTICIPANTS

The participants in this study were the Grade 9 students of Bautista National High School, Division of Pangasinan II. A total of 1,525 Grade 9 students were involved in the study, selected and determined by using Slovin's formula at a .05 level of error.

IV. TREATMENT OF DATA

The following data analysis was used, the frequency counts and percentage distribution, the analysis of variance (ANOVA), and the measures of central tendencies such as mean and median.

V. RESULTS/FINDINGS

1. The performance of the students in the diagnostic test conducted is below the average.
2. The common problems faced by the students in MAPEH were the following:
 - a. Formulation of problem / or writing a valid and reliable problem.
 - b. Formulation of the conceptual framework.
 - c. Formulation of valid gathering tools.
 - d. Application of the correct statistical method
3. The action plan proposed in this study that focused on Project-Based Learning (PBL) improved the performance of the Grade 9 students and enhanced their MAPEH skills.
4. There is a greater improvement in the performance of the students in the summative test conducted in MAPEH.
5. There is a significant relationship between the performance of the Grade 9 students on the diagnostic and summative tests.

VI. RECOMMENDATIONS

Based on the findings, analysis, and results of the study the following recommendations are hereby advanced:

1. Teachers should conduct a diagnostic test in research to determine the skills needed by the students. This will help the teachers and the school heads to have a pre-planning of the appropriate teaching methodology and instructional materials.
2. The action plan proposed in this study should be widely used by the division office to have a data bank of information for further research and test of effectiveness.
3. The use of PBL as a teaching approach to develop the MAPEH skills of the Grade 9 students should be tested using another variable to sustain its effectiveness.

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INDIGENOUS GAMES IN INDIA: THEN & NOW

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ABSTRACT

Indigenous Games are the Representation of Heritage and Ancestral Legacy of a Nation. They are one of the Main Possessions and Assets of Indigenous People. They Account for Teaching Valuable Skills and Work for Physical And Mental Wellbeing. The History of these Games Goes Back to Ancient India. Some of the Indigenous Games are Played Still Today While Some Have Achieved a Status to be played at National and International Level. With the Course of Time, Indigenous Games have undergone Certain Changes and Transformations. However, Various Initiatives are taken from Time To Time for the Upliftment of These Games. The Present Paper Focuses on Some Indigenous Games of the Country, Their History & Significance and Approaches Taken for their Upliftment. In Addition, Emphasis on how they could be Helpful for Future Generations Is Discussed Underneath

KEYWORDS: *Indigenous, Indigenous games, Significance, Initiatives.*

INTRODUCTION

Games and sports are often understood synonymously however both are entirely different. A game refers to physical activity involving more than one person and a sport refers to an individual's skills and performance, despite team sports. There lies another difference between these two, i.e. the former is based on mental strength whereas the latter on physical energy. Game is often played for fun and entertainment, etc. with a friendly attitude whereas a sport is played with a competitive attitude. It is evident that games and sports have been invented across cultures as a means to reveal skill and physical expertise through social and cultural processes. Sports on one hand involve athletic activities including some degrees of competition whereas same does not apply to a game. Most of the games involve some form of running, throwing and jumping acrobatics, all of which developed from basic hunting skills. Sports and culture cannot be separated from each other. There has been always a desire for recreational play that eventually inspired the codification of early games and invention of the new ones despite many cultures in the world combined religious and political elements in their games.

INDIGENOUS GAMES

Ferriera (2014) states that indigenous games are a part of symbolic patrimonial heritage of the indigenous people. The word indigenous is actually derived from the Latin word '*indigena*' that means '*native*'. Indigenous actually pertains to some specific geographical area that may or may not be huge. That also pertains to the living beings that are born or grow in a place to where they belong actually. When concerned with people, it has a sense of relating to the earliest known inhabitants of a particular place especially that was colonized. According to the Merriam-Webster dictionary, indigenous applies to something which is not only native but which has never been brought from elsewhere. Hence, indigenous games can be referred to the games that have been invented from any specific place or particular geographical area, i.e. native to a place.

GAMES IN ANCIENT INDIA

India has its own history of games and sports that had been an integral part of the country during ancient times. Some of the ancient games have either disappeared from rural and urban lives while some are played in the country even today. History of games in India dates back to the ancient times of the Indus Valley and Vedic Civilisation. The seals discovered from the Indus Valley sites throw light on the involvement of people of Harappa and Mohenjodaro in some sort of physical activities especially hunting and boxing. Furthermore, evidences from Ramayana and Mahabharata demonstrate that variety of games like hunting, swimming, boating, weight-lifting, wrestling, archery, chariot-racing, horsemanship, games using marbles, dice, balls, etc. were prominently played by the people of those times.

When the accounts of ancient games are concerned, Pali literature is found to be one of the eminent sources of the records of the games in India during the 6th century. In this regard, Upali (2009) in his research found that some of the games of present day have their appearance in Pali literature and are transferred to us in a gradual process of development. Atharva Veda, one of the four Vedic scriptures of Hinduism depicts a mantra which is the main anthem in history of traditional sports. The mantra says that "*Duty is my right hand and the fruits of victory in my left*" and it basically holds the same sentiment of the



traditional Olympic oath. It is a notion that the modern day Olympic Games and disciplines are a sophisticated version of the traditional games originated in ancient India. Some popular sports of today like chess, polo, archery, ludo, cards, Indian martial arts, judo, karate, wrestling, weight-lifting, etc. are believed to be originated in India and hence can be referred to as Indigenous Games of India. Yoga, which has taken a very prominent place worldwide, was an essential component of ancient Indian civilisation and culture. The epics of India elucidate numerous Indian traditional sports like dice, gilli-danda, chariot racing, gymnastics, etc. as well. *Manasollasa* also known as *Abhilashitartha Chintamani*, a Sanskrit text composed by Kalyani Chalukya king, Someshvara III in the early 12th century is structured into five sub-books. In this literature, the fourth sub-book gives description of some sports such as fishing, dog racing, horse racing, elephant racing, archery, wrestling and athletics. In addition, the text also describes some unique team sports, such as a form of Indian polo. It is believed that games like chess, wrestling, polo, archery, hockey, etc. were originated in India (sports.indiapress.com). With the passage of time, some indigenous and traditional games that owe their origin in India became popular and universal whereas many of them got limited to the local traditions. Here are the few indigenous games of India with their characteristic features, origin and traces:

S.No.	Traditional/indigenous games	Vernacular names	Characteristics	Traces in	Origin Place
1.	Gatka*	-	It is a type of traditional martial art for self-defence. It is an amalgamation of acrobatics and sword fight and considered as spiritual as well as physical exercise.	15 th Century	Punjab
2.	Gilli Danda	GulliDanda, Viti Dandu, KittiPul	It is similar to the games of bat and ball like cricket and baseball. Believed to be the origin of Western games like baseball, cricket, and soft ball. It is still played in Bangladesh, Nepal, Pakistan, Cambodia, etc. Similar games to gillidanda are popular among communities of some parts of Europe, North and South America, Russia, South-East Asia, Canada, etc.	About 2500 years ago.	Indian Subcontinent
3.	Jallikattu	Sallikkattu, Eruthazhuvuthal, Mancuvirattu	A bull being released into the crowds of people and multiple participants must attempt to hold the horns and hump of the bull. Celebrated during Pongal in Tamil Nadu.	400-100 Century BC	Tamil Nadu
4.	Kabaddi	hu-tu-tu, ha-do-do, chedugudu, gudu, theechub	It is played between two teams on opposite half of a court or field. Individual players make turns crossing against other side of the team repeating "kabaddi, kabaddi."	Mahabharata (Indian epic)	India
5.	Kalaripayattu*	Kalari, Kalarippayattu	It is considered among most scientific and one of the oldest martial arts of the world. It is based on Hindu and Ayurveda concepts of medicine and practiced in a special building called <i>kalari</i> .	3 rd Century AD of Tamil Literature	Malabar Coast, Kerala
6.	Kho kho	-	It is a modern form of Run & Chase. It is among the oldest traditional games of Indian Subcontinent and second most widespread tag game after Kabaddi.	Mahabharata (Indian epic)	Maharashtra
7.	Lagori	Pitto, Pitthu, Sitoliya	It is a team sport that involves a pile of seven stones and a ball. It is played by at least 30 nations across the world.	Bhagwat Purana (about 5000 years ago)	Southern parts of the Indian Subcontinent
8.	Mallakhamb*	Mallakhamba or Mallakhamb	It is aerial Gymnastics. It is a combination of Yoga, Gymnastics, and Martial Arts performed in concert with a vertical stationary or else hanging wooden pole, rope or cane.	Manasollasa written by Someshvara III in 1135 A.D.	Indian Subcontinent
9.	Silambam	Chilambam, Chilambattam	It is an ancient weapon based Martial Art. It is closely associated with Kalaripattayuo of Kerala.	Sangam Literature, 2 nd Century BC	Tamilakam, Tamil Nadu



10.	Thang Ta*	Huyen Lallong	It is one of the two components of huyenlallong. It is the art of sword and spear and a method of safeguarding.	-	Manipur
11.	Vallamkali	Snake boat race	It is a traditional boat race and a type of canoe racing. Conducted during the harvest season of Onam festival.	First invented in Assyria, in BC 300. Invention also took place at the same time in Andaman and Nicobar Islands, Comodia, Bangkok, Burma, Britain etc.	Kerala

***Approved by the Ministry of Youth Affairs and Sports (MYAS) in December, 2020 for including in Khelo India Youth Games (KIYG), 2021.**

SIGNIFICANCE OF INDIGENOUS GAMES

Playing a game is fun, entertainment and amusement but it is also a recreation and a means to be fit and healthy. A nation is known by its indigeneity, knowledge, culture, traditions, etc. and these components are an indispensable part of intangible heritage. Indigenous games form the backbone of any community and a nation as well. Indigenous games are environment friendly, bring people together, reconnect the urban people to the roots of culture, enhance physical and mental health, improve life skills and act as a bridge between generations. They are the symbol of the cultural diversity of our societies and an efficient resource to convey values of harmony, solidarity, unity, diversity, inclusiveness and culture which is a prerequisite for development approaches.

INITIATIVES FOR THE UPLIFTMENT

Various initiatives have been taken from time to time to revive games and sports and their upliftment as well. The Government of India had launched several programmes to encourage youth and sports in the country. A report on evaluation/impact assessment of Rural Sports Programme to the Government of India by Centre for Market Research & Social Development (CMRSD) mentions that there has been a strong tradition of indigenous and traditional games in all parts of the country and indigenous games are being promoted through the schemes related to rural sports in India. However, many parochial and little publicized traditional games and sports have been ignored as most of the efforts concentrated on the mainstream sports. The Sports Authority of India (SAI) has taken various initiatives from time to time to promote indigenous and traditional games in the country through various schemes.

Under the Khelo India scheme, an exclusive component called "Promotion of Rural, Indigenous and Tribal Games" is added for the promotion and development of traditional sports of the country. In addition, Sports Authority of India (SAI) also promotes Indigenous Games and Martial Arts (IGMA) in nine disciplines under National Sports Talent Contest (NSTC) where talented children are selected of 8-14 years of age. Sports Authority of India (SAI) has adopted following indigenous games for the promotion: Kalaripayattu from Kerala, Silambam from Tamil Nadu, Kabaddi from Telangana, Archery from Jharkhand, Gatka from Punjab, Mallakhamb from Maharashtra, Thang Ta from Imphal, Mukna from Imphal and Khomlainai from Assam. Of the above listed indigenous games, Kalaripayattu, Gatka, Mallakhamb and Thang Ta (in addition to Yogasana) have been added in Khelo India Youth Games (KIYG) in 2021.

CONCLUSION

Indigenous games have a potential to express cultural heritage of our country. They need to be popularised at global level with high involvement of indigenous people and huge promotions. These games can be adopted and launched with certain modifications to get them spread well. These games can be enhanced and uplifted as they pass on our heritage and do not require an expensive gear to start and set up. It is also required to aware people about significance of these games. Furthermore, the relevance and importance of these games should be a part of educational curriculum of the schools, colleges and universities as children and youth are the core population and backbone of any nation. It is the need of the hour to re-introduce this treasure in their minds which will enable to carry forward this heritage to future generations.



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