ISSN:2455-7838 (Online)
DOI : 10.36713/epra2016

SJIF Impact Factor(2022) : 8.197 ISI I.F Value : 1.241

EPRA International Journal of

RESEARCH & DEVELOPMENT

(IJRD)

Monthly, Peer Reviewed (Refereed) & Indexed International Journal

Volume - 7 Issue - 12 December 2022

ISSN (Online): 2455-7838
SJIF Impact Factor (2022):8.197
ISI I.F. Value : 1.241
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EPRA International Journal of

Research & Development

(IJRD)

Monthly Peer Reviewed & Indexed International Online Journal

Volume: 7, Issue:12, December 2022

Indexed By:

Published By
EPRA Publishing

SJIF Impact Factor 2021: 8.013| ISI I.F.Value:1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 7| Issue: 12 | December 2022 - Peer Reviewed Journal

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EXPERIMENTAL ANALYSIS OF PERFORMANCE OF SOLAR WATER HEATER FOR VARIATION IN SOLAR RADIATION LEVEL

Subhash Prasad[1, a*], Bhupendra Gupta[2, b,] Jyoti Bhalavi[3, c,]
[1] *Jabalpur Engineering College, Jabalpur, M.P., India*
[2] *Jabalpur Engineering College, Jabalpur, M.P., India*

ABSTRACT
Solar radiation falling on the surface of the Earth may be proven to be a major source of energy, which can be used to utilize various fields to maximize their efficiency and Output at optimum levels. Paper is also based on the Solar Radiation falling on the flat plate collector that is absorbed by the water flowing in the Copper tube Inside the collector. We try to optimize the uses of Solar Radiation for household purposes by perfect solar radiation intensity, which varies from a high radiation level at 597 W/m² to a medium radiation level at 300 W/m². In this range, we get maximum efficiency concerning solar radiation, on the other side at low radiation levels results are different. So the main aim of the experiments is to optimize the best utilization the solar radiation.
KEYWORDS: *Solar Radiation Level, Solar Efficiency, Heat Loss Coefficient, Forced Flow.*

INTRODUCTION

Solar water heating system is an important part of human life, not only in India, where it is used extensively in the world. It helps to save a huge amount of energy and serves in continuously to maintain human comfort, basically in India presence of solar radiation varies in nature day by day, which is why we have done experiments on the scenario of this concept, generally in this paper tried to improve utilization of variated solar radiation in our experimental setup. Solar water heater system works on the principle "Green House Effect" in which heat is trapped inside the flat plate collector and transferred to the tube in which flowing water absorbs heat and got heated and the temperature of the water increases. Solar energy is the perfect energy source, but there are so many difficulties, like weather conditions, losses of heat, and instrument efficiency. The solar heater is a device that is used for heating water, for producing steam for household and industrial purposes by utilizing solar energy.

Our experiment analysis works on the radiation of solar energy which is not in a proper and continuous manner but still, it is a most useful and powerful source of energy, that is why in the current scenario solar energy is most considered to use at a large scale. We work on the principle In which is how solar radiation differs when solar radiation varies from a high radiation level to a low radiation level, we also use a forced flow water system and make other parameters constant like wind flow, tilt angle, and inlet water temperature. we collect data from the experiments which are performed in the laboratory, and output and results show in form of graphs and tables.

In this area, some other works also motivate us to enhance the proper utilization of solar energy for solar water heater systems. Other works performed in a multidirectional way to enhance solar energy like heat storage as a phase change material, variation tilt angle, variation in wind speed in India, etc.

Solar radiation is a very wide area to learn about to abstract maximum energy from the sun and it can be proven to use as a main source of energy if perfect analysis will be performed in suitable directions.

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Experimental Apparatus

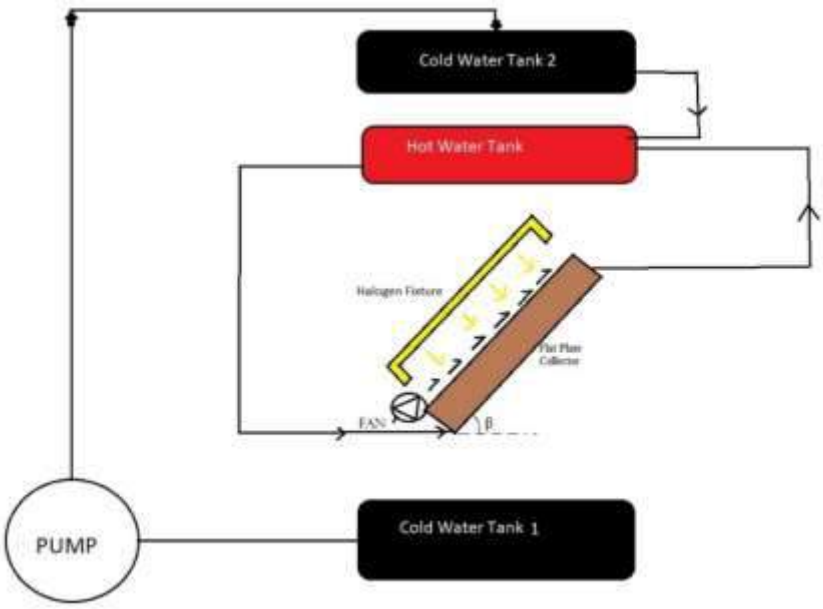

Fig.1. Schematic diagram of solar water heater .

Fig.1 shows the schematic diagram of experimental setup of flat plate collector. The flow of from the bottom of collector plate inclined at an angle β which is taken by us is 60 degree, with the horizontal. The irradiation from 597 Watt/m^2 is artificially generated by halogen fixture. In the setups forced flow of air over the collector surface flowing through the fan. The warmed water flow out from the collector tubes through an outlet placed at the top of collector plate by thermo siphon effect and goes into the mixing chamber of hot water tank. The setup is equipped with multiple electronic and mechanical monitoring and control equipment included with the sensors. Halogen Fixture is a part of the setup and artificial radiation source which is inclined at 60 degree from latitude, with fixed orientation, we can change orientation of Flate Plate Collector from 40 degree to 60 degree.

Methodology

Experiments were performed as per the manual in which Instruction is given for Analysis. And calculation and analysis are also done with help of basic formula and methods:

Total Heat Loss Coefficient (U_{total})

Total heat loss is important parameter in the field of Thermal energy, Heat loss can May be direct many form like Conduction, Convection And Radiation also, it may be occur from the source of the generation to the absorption of heat at the surface of the flat plate collector. In every system, no one can be perfectly ideal but in the case of the thermal system Insulation can be play a important role to avoiding the losses. In our System try to minimize losses of heat in two ways, where is one in the collector and another one in the pipes. In which they provide the better Insulation up to minimize most of the heat loss to the environment. In our setup there are three point where as heat loss may occur, from the top, from the bottom and the edge of the flat plate collector. If the losses increases then usefull heat decreases, in the experiment we try to generate more usefull heat and try to save heat heat without the losses. Therefore, we need to calculate Total heat loss coefficient. So there is a specific formula to calculate total heat loss coefficient formula.

$U_{total} = U_t + U_b + U_e$

From the Klein (1975), the top heat loss using the flowing formula for the calculations,[2]

$$U_t = \left\{ \frac{\frac{1}{N}}{\frac{C}{T_P}\left[\frac{T_P - T_a}{N+f}\right]^{0.33} + \frac{1}{h_a}} \right\} + \left\{ \frac{\sigma(T_P + T_a)(T_P^2 + T_a^2)}{(\varepsilon_p + 0.05N(1-\varepsilon_p))^{-1} + \frac{2N+f-1}{\varepsilon_g} - N} \right\}$$

Where,[1], C = 365.9*(1-0.00883β+0.0001298β),

F = (1+0.04h_a – 0.0005h_a^2) *(1 + 0.091N),

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$h_a = 5.7 + 3.8v$

U_t is the heat loss coefficient in the form of losses by top of the surface of the solar collector to the environment.

heat loss coefficient by the bottom, $U_b = \frac{k_b}{x_b}$

heat loss coefficient by the edge, $U_e = U_b\left(\frac{A_e}{Ac}\right)$

U_b and U_e are the heat loss coefficient from the bottom and edge respectively.

Heat Removal Factor (F_R)

Heat removal factor plays an important role in the system where heat transformation occurs, the importance of the heat removal factors remains with the efficiency of the system. It is the combination of the factors like inlet water temperature, outlet water, ambient temperature, and area of the collector etc. Heat removal factor is the ratio of the actual useful energy gain to the useful energy gain if the entire collector were at the fluid inlet temperature.

$$F_R = \frac{\text{Actual useful energy gain}}{\text{Useful energy gain if the entire collector were at the fluid inlet temperature}}$$

Mathematically,

$$F_R = \frac{\dot{m}C_p\left[T_{fo} - T_{fi}\right]}{A_c\left[I_t\tau_o\alpha_o - U_L\left(T_{fi} - T_a\right)\right]}$$

Thermal Efficiency

Efficiency deals with the output directly, Efficiency is the most important part of the system's output. The efficiency of the system depends upon some parameters like the product of the glazing's transmittance and absorbing plate's absorption, intensity of radiation falling on the collector, water inlet temperature and ambient air temperature. In our experimental setup for flat plate collector based solar water heater system the efficiency is define as the ratio of the useful energy delivered to the energy incident on the collector aperture.

Thermal Efficiency is the Ratio of the usefull heat gain to the total input energy.

Mathematically,

$$\eta = F_R\left[\left(\tau_o\alpha_o\right) - \frac{U_L\left(T_i - T_a\right)}{I_t}\right]$$

Observation

The Experiments was performed to optimize results and calculations with the help of Solar Water Heater System in the Laboratory under the supervision of professional expertise. Aim of the experiments is defined the solar energy to use heat up the water for household purpose at various ambient conditions in which solar radiation also varying in nature, which is maximum to minimum by every day and also different in monthly wise and year wise also. Based on calculations and output we optimize the results and used above methodology and formulas to get all parameters and factors affecting variables concluded.

Wind speed (v): 3.4 m/s
Ambient Temperature (T_a): 30^0C
Radiation level (I): 597 W/m^2
Water mass flow rate (m.): 0.06800 kg/sec

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S. no.	U_t	Ue	U_b	U_l	F_R	Effi.
1.	3.2670	0.354	0.8	4.421024	0.694186	0.58572
2.	3.2586	0.354	0.8	4.412624	0.58137	0.497545
3.	3.2530	0.354	0.8	4.407017	0.48299	0.423347
4.	3.2684	0.354	0.8	4.422484	0.40643	0.373956
5.	3.2849	0.354	0.8	4.438938	0.323326	0.306063

Table 1. Observation for Efficiency and all Heat Loss Coefficient at varying varying Other Parameter.

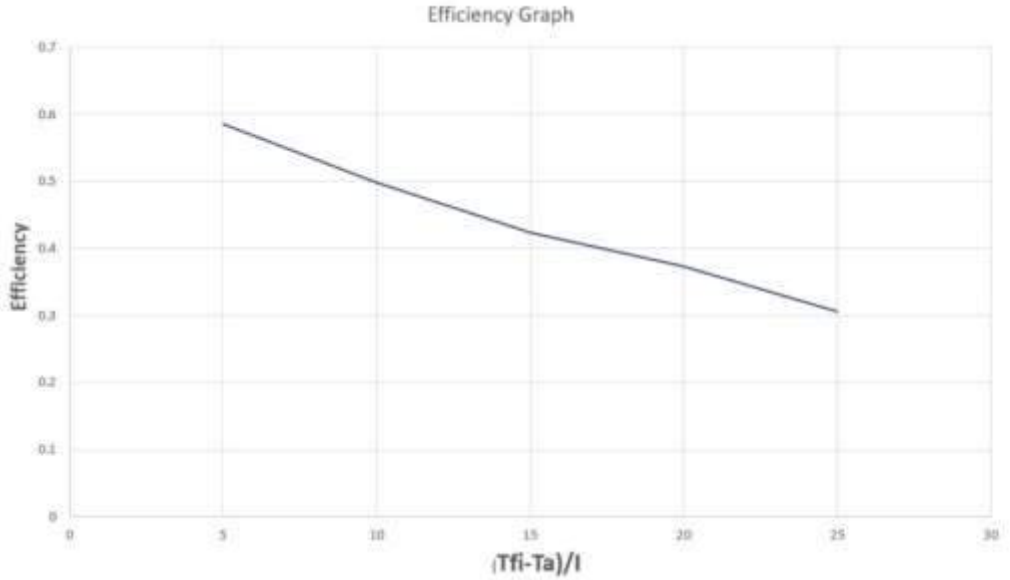

Fig.2. Efficiency Graph for different Radiation levels.

Fig.2. shows the relation between Efficiency and variations in solar radiation falls on the flat plate collector at various ambient conditions. Graph plot on the basis of the result from the experimental calculation, in which maximum efficiency start from 68% which is decreased up to 30%. These experiments performed at high radiation level at 597 W/m^2 which is set according to the experimental setup and get efficiency up to maximize level.

Wind speed (v): 3.4 m/s
Ambient Temperature (T_a): 30^{0}C
Radiation level (I): 300 W/m^2
Water mass flow rate (m.): 0.06800 kg/sec

S. no.	U_t	Ue	U_b	U_l	F_R	Effi.
1.	3.2670	0.354	0.8	4.421024	0.694186	0.545438
2.	3.2586	0.354	0.8	4.412624	0.58137	0.467953
3.	3.2530	0.354	0.8	4.407017	0.48299	0.382277
4.	3.2684	0.354	0.8	4.422484	0.40643	0.285358
5.	3.2849	0.354	0.8	4.438938	0.323326	0.17959

Table 2. Observation for Efficiency and total Heat Loss Coefficient at radiation level of 300 W/m^2

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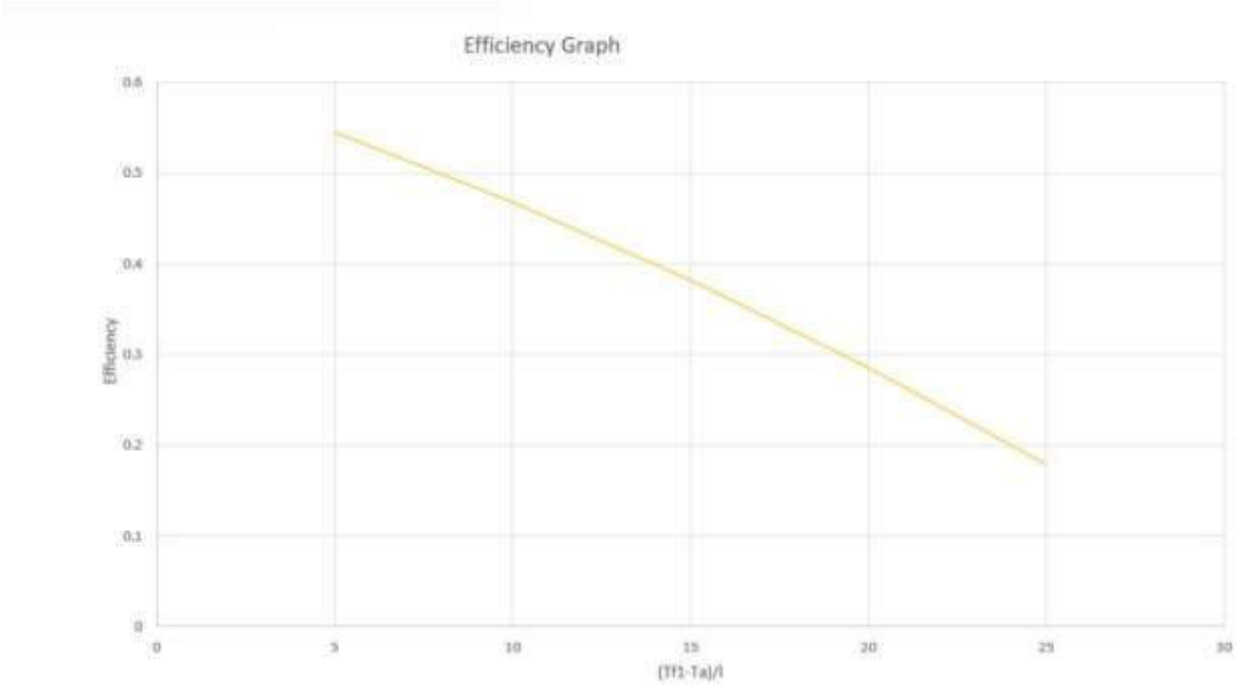

Fig.3. Efficiency Graph at Radiation level of 300 W/m^2.

Fig.3. shows the relation between Efficiency and variations in solar radiation falls on the flat plate collector at various ambient conditions. Graph plot on the basis of the result from the experimental calculation, in which maximum efficiency start from 55% which is decreased up to 19%. These experiments performed at high radiation level at 300 W/m^2 which is set according to the experimental setup and get efficiency up to maximize level.

Wind speed (v): 3.4 m/s
Ambient Temperature (T_a): 30^{0}C
Radiation level (I): 160 W/m^2
Water mass flow rate (m.): 0.06800 kg/sec

S. no.	U_t	Ue	U_b	U_l	F_R	Effi.
1.	3.2670	0.354	0.8	4.421024	0.6935	0.5863
2.	3.2586	0.354	0.8	4.412624	0.4850	0.4328
3.	3.2530	0.354	0.8	4.407017	0.3421	0.3093
4.	3.2684	0.354	0.8	4.422484	0.1703	0.1942
5.	3.2849	0.354	0.8	4.438938	0.0599	0.0790

Table 3. Observation for Efficiency and all Heat Loss Coefficient at varying varying Other Parameter.

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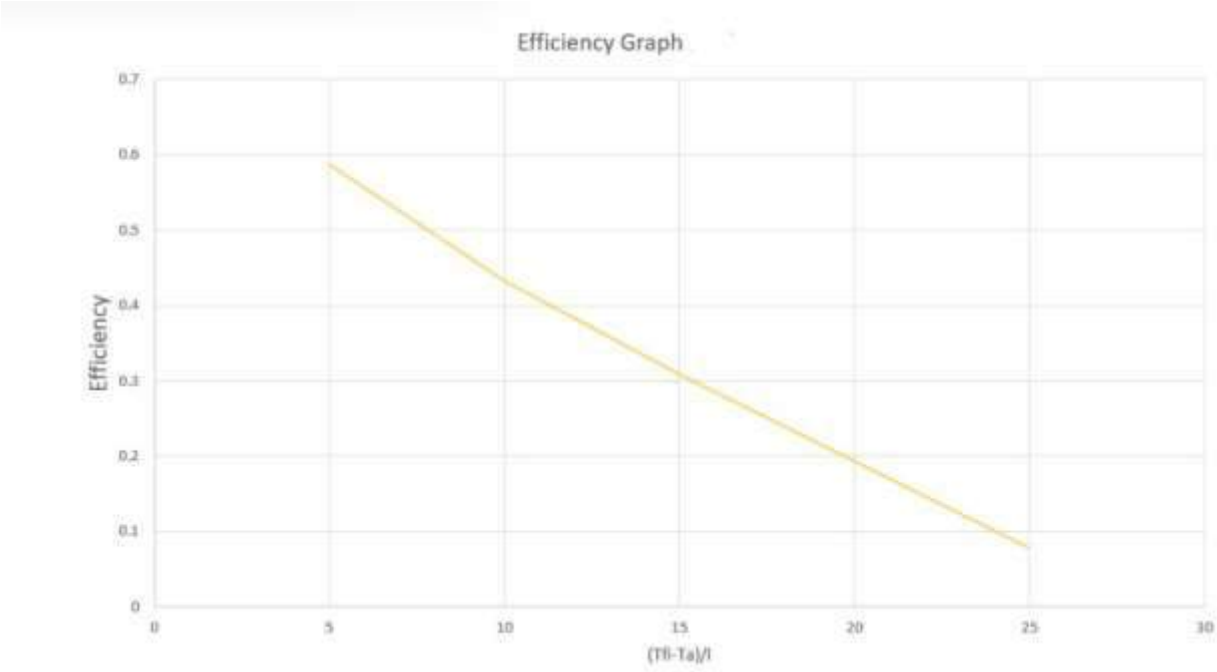

Fig.4. Efficiency Graph for different Radiation levels.

Fig.4. shows the relation between Efficiency and variations in solar radiation falls on the flat plate collector at various ambient conditions. Graph plot on the basis of the result from the experimental calculation, in which maximum efficiency start from 58% which is decreased up to 8%. These experiments performed at high radiation level at 160 W/m^2 which is set according to the experimental setup and get efficiency up to maximize level.

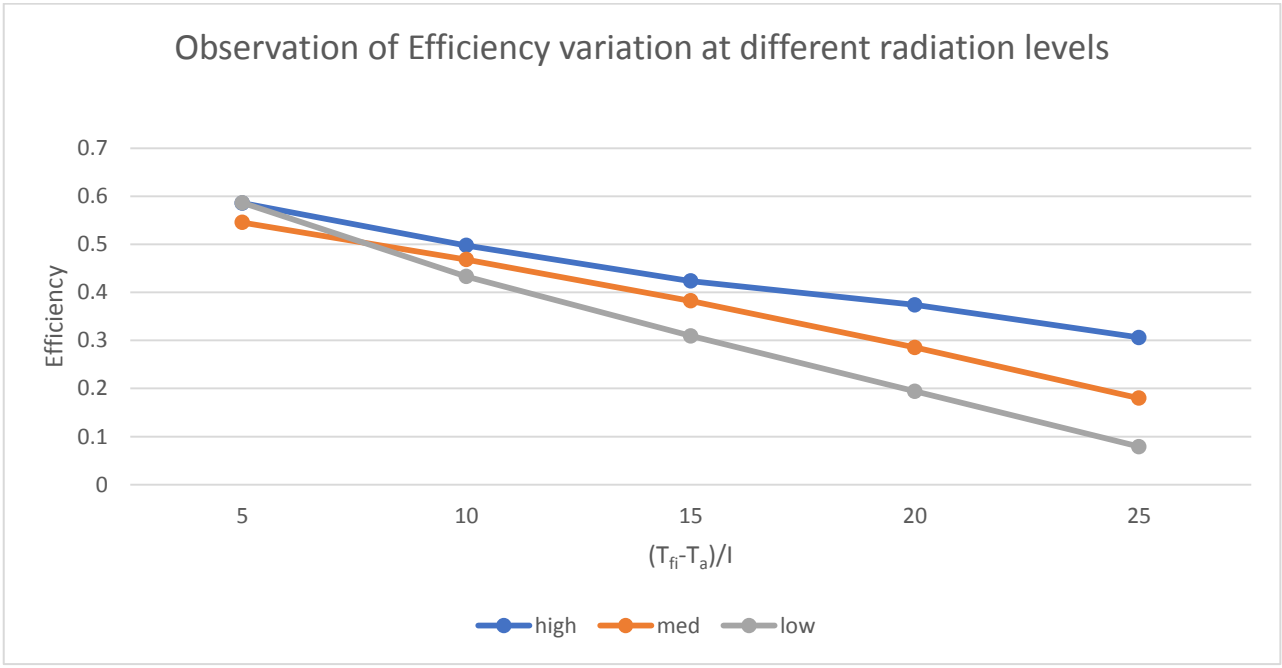

Fig 5. Comparative efficiency graph at various radiation levels.

In the graph value of **high** is 597 W/m^2, **med** is 300 W/m^2 and **low** is 160 W/m^2.

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RESULT AND DISCUSSION

The experimental Setup has given optimized results to understand the effect of heat transfer variables for the study of solar heat collectors. As in Fig.1. we can conclude that when the solar collector plate is parallel to the source of radiation, almost all the radiation falls perfectly which results is least loss of heat between the collector fluid its convective environment and the loss through conduction in raising the plate temperature which do not take part in increasing the temperature of fluid flowing through the collector.

The variation in the solar radiation shows as shown in Fig.4. and the data is collected in Tablas that up to a particular radiation Level can be differentiated and conclude Efficiency is maximum at high radiation Level from 68% to 30%, that means variation in Efficiency is Minimum at high radiation Level, but if we talk about other radiation Level like medium radiation is 300 W/m^2, variation in Efficiency from 55% to 18% which just similer to high radiation Level but in the case of low radiation level Efficiency from 58% to 8%, which is huge difference, that can be conclude low radiation level is not desirable for proper human comfort at any level, variation in Efficiency with the solar radiation may effect the entire system of the solar water heater system, and uneven Outputs makes the system less usefull of Solar energy.

Nomenclature

Ac	:	collector's area = $0.74115 m^2$
Ae	:	edge's area = $0.32775\ m^2$
C_P	:	Sp. Heat of water = 4180 Joule/kg-^oK
I_t	:	Radiation received on the collector (W/m^2)
k_b	:	back insulation conductivity = 0.04 W/m-K
k_e	:	edge insulation conductivity (W/m-K)
m	:	mass flow rate of water (kg/sec)
N	:	Number of glass cover = 1
T_a	:	atmospheric temperature (^0C)
T_p	:	temperature of plate (^0C)
U_t	:	heat loss coefficient from top (W/m^2K)
U_b	:	heat loss coefficient from bottom (W/m^2K)
U_e	:	heat loss coefficient from edge (W/m^2K)
U_b	:	constant for experiment
U_e	:	constant for experiment
V	:	velocity of wind (m/sec)
x_b	:	thickness of back insulation = 0.05 mm
x_e	:	thickness of edge insulation = 25 mm
τ_0	:	glass cover Transmissivity = 0.85
α_0	:	absorbing plate Absorptivity = 0.96
ε_p	:	absorbing plate Emissivity = 0.12
ε_g	:	glass cover Emissivity = 0.88
σ	:	constant of Stephen Boltzmann = 5.67 x 10-8 $W/m^2\text{-}K^4$
β	:	collector's tilt angle (degree)

In the experiments following parameters are taken for the analysis to get optimized results and minimize heat losses with the help of experimental setup in the Laboratory.

- Wind Flow speed in m/sec
- Solar Radiation Intensity (I_t) in W/m^2
- Ambient Temperature of Collector surface in ^0C
- Temperature of Inlet Water at Collector (T_{fi}) in ^0C
- Temperature of Outlet Water at Collector (T_{fo}) in ^0C
- Tank Storage Temperature (T_s) in ^0C
- Heat loss factor, (U_{Loss}) in watt/$meter^2$.

CONCLUSION

Based on the results and outputs of our experiments, the plotted graphs are able to describe, when the solar irradiance is high, which is taken by us is 597 W/m2 and moderate whose value is 300 W/m2, flowing Sufficiently to transfer heat to water and at the same time, it gives better efficiency at minimum variation level except for low radiation level. The difference in efficiency is greater in low radiation levels but both high and medium radiation levels are desirable for the system to work.

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PHILOSOPHICAL ANALYSIS OF IBN SINO'S CONCEPT OF "TEMPERAMENT"

Salomova Nigina Muzaffarovna
Physician-Researcher of the "Salomatlik Center" of the Bukhara City Medical Association

ABSTRACT
This article explains the essence of Ibn Sina's concept of "client". The philosophical essence of the concept of the client is analyzed. A client is an internal immanent natural, biological norm of a person.
KEY WORDS: *Ibn Sina, health, illness, client, inner immanent norm.*

INTRODUCTION

"Medicine studies the health and disease of the human body. Knowledge of everything, if it has causes, is formed and perfected by studying these causes. Therefore, it is necessary to know the causes of health and illness. Health, illness and their causes are sometimes open, sometimes hidden..." [1]. . Studying the causes first of all leads to the knowledge of its quality indicators, and then its quantitative indicators, to know the norm, essence, and truth from it. Body temperature of 36.60 is the first sign of health. The amount of sugar in the blood is 0.1%.

METHODS

The standard of health in medicine is "typical amount", "moderate", "necessary amount", "average", "norm", "in moderation", "order", "had", "moderate", "al-miqdar al-lozim", It is expressed by concepts such as "quantity close to the truth", "event", "customer". Standard is the golden law of existence. It applies in all aspects of life: it is especially evident in economy, politics, health, love, manners, behavior. In fact, the core of our material and spiritual life is the law of norms. The distance between the Sun and the Earth never goes out of proportion. A perfect person is a standard of humanity, equally valuable for all countries and all planets, and will remain the standard of humanity. Abu Ali ibn Sina devoted his life to the study of the standard of human health. His main object of research was the study of the norms of health and illness of the human body. In the "Laws of Medicine" health is given a very succinct and simple philosophical definition:

"The body is a golden crown of honor on the head of a healthy person, and this crown cannot be seen by anyone but a sick person.

Scholar: "Every healthy person has a little bit of imbalance, it's not too big." ..."The onset of illness is nothing more than a deviation from the state of balance," he says. The same disease in the body or a certain organ - a single disease, a combination of two or more diseases - is a type of complex disease.

Ibn Sina defines health in the work "Dasturul Ilaj" as follows: "Health is the same structure and composition of individual and complex organs, the service of each organ is completely healthy, safe, and shows that the normal state of the organ is not disturbed. Damage to the services of the members due to the change of the client and the composition is one of the signs of the emergence of the disease. In the work "Law", health is defined as follows: "Health is such a skill or state that healthy actions arise from the members." He gives several classifications to the disease: "Disease is a disturbance of the internal environment and an obstruction of vital activity caused by a disturbance of the steady state consisting of the balance of the body's physiology and the balance of the body under the influence of certain disease-causing factors in the internal and external environment." Elsewhere in the "Law": "Disease is an unnatural state, a defect in any part of the body." There are three types of disease. The first is that the misogyny of individual members is not healthy. This condition is called a disorder of the individual members. The second is caused by a change in the natural state of the device of complex organs. The third is the joining together or separation of the members from their natural connection, which is called disintegration. This kind of disease is common."

The World Health Organization says: "Health is not the absence of disease or infirmity in a person, but also the complete physical, mental and social well-being of a person." When we do a comparative analysis of these classifications, we come to the conclusion that the modern primitive organs and the whole body of the organism have not found their expression. Ibn Sina, the

[1]Abu Ali Ibn Sino. Tib qonunlari. I kitob.Ikkinchi nashri. O'zbekiston SSR "Fan" nashriyoti. T.: 1983. 6-bet.

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Sultan of Tib, knew in his time that mizoj is an internal immanent natural, biological norm. He repeatedly emphasized that the first means of achieving health is the health of the client. According to the scholar, the human body is in three states according to its quality and quantity.

1. Health;
2. Sickness condition;
3. Neither healthy nor disease state;

He also divided the levels of health and disease according to their qualitative and quantitative indicators.

"Health is such a skill or state, due to which healthy actions arise from the members."

For example, there are four levels of health:

1. The body is very healthy;
2. The body is not very healthy;
3. The body is neither healthy nor sick;
4. The body is in good condition, the recipient of health quickly.

Illness in two levels:

1. The body is slightly ill;
2. The body is excessively sick.

It is this kind of health and, on the contrary, the qualitative and quantitative indicators of the patient's condition are normal anatomy and pathological anatomy; they study subjects such as normal physiology and pathological physiology.

Scholar writes: "Each body has a limit of resistance to necessary construction as required by the amount of innate heat and innate wetness of the body. The body does not cross that limit, but sometimes the body does not reach that limit with the occurrence of causes that contribute to drying or otherwise destroy it[2].. Many people call this (the first) a natural death, and the next an accidental death. In fact, the body temperature is between certain temperatures. This heat is hereditary, passed on from the mother. Crossing this heat limit to one side or the other will lead to death. Body was able to clearly indicate the natural-congenital temperature limit, and after the limit, death, precisely the limit of natural death [3].

When this phrase is translated from Persian into Uzbek (the translation is by the author - S.N.), it has the following meaning: "There is a standard in every body's struggle with erection, and that standard is related to the natural client nature of man, the amount of innate heat and innate wetness, and cannot exceed this standard. But it is possible, writes Ibn Sina, that the human body tends to build up for various reasons, or for another reason, it tends to collapse. Because he has reached this standard before his time[4]. Many people call long life - long life as natural death, and the second state as arazi (artificial death before natural death). Ibn Sina shows the violations of norms in the organs that cause acceleration of natural death.

"Every time there's a good mood, (warm) mother's day is cold, and there's a way of life" (page 176). Translation of this thought: "After the complete disappearance or end of the innate temperature in the human body, the innate heat, i.e. the innate natural temperature of the body, disappears and natural death occurs. [5] " Scholar's above opinions indicate that the quantity and quality indicators of the human body in the state of health, illness and death are different.

The health of each body part affects another part. Therefore, Ibn Sina believes that it is necessary for a person to know his body.

Misogyny can also be determined by the color of human teeth:

1. Yellow tooth - hot-dry client;
2. White tooth - cold and wet client;
3. Dark tooth - cold and dry client;
4. Red tooth - hot-wet client.

[2] Ibn Sino.Tib qonunlar. Uch jildlik saylanma. 1-jild.Toshkent. Abdulla Qodiriy nomidagi xalq merosi nashriyoti. 1992. 72-bet.

[3] Qarang.:Abu Ali Ibn Sino. Qonuni tib: Iborat az 5 kitob.-Dushanbe.:Sarredaksiyai ilmii Ensiklopediyai Sovetii Tojik.1991. Kitobi 1. (Andar umuri hamagonii pizishki).384 sahifa. Biz tahlil etgan saxifa 174-sahifa.

[4] Mafhumi “Garmi modarzodi” va “margi tabii”// Dar “Kitob al-qonun fi tib”i Ibn Sino. -Dushanbe.:Sarredaksiyai ilmii Ensiklopediyai Sovetii Tojik.1991. Kitobi 1. 174-sahifa.

[5]Abu Ali Ibn Sino. Kanon vrachebnoy nauki. Izd.vtoroe. T.: «Fan».1981. Ibn Sina. Izbranie filosofskie proizvedeniya.M., «Nauka». 1980. Abu Ali Ibn Sino. Tib qonunlari. Uch jildlik saylanma. T., «Abdulla Kodiriy nomidagi xalk merosi» nashriyoti. 1992. T. 1,2,3. Ibn Sina. Poema o medisina. (Urdjuza) Izbrannoe. Izd.SK Kompartii Uzbekistana. T.,1981.

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 7 | Issue: 12 | December 2022 - Peer Reviewed Journal

Allama very rightly recognized that many people believe that health depends on the quantity or quantity of blood in the body, but in reality it is not so, health depends on the quality of blood. In modern terms, health depends on the immanent quality of blood.

According to Claude Bernard, "blood is a mirror of the internal organs."

I. When Ibn Sina says "a good quality state of blood", Ibn Sina understands the natural norm of blood. "Some people suspect that: "If the hilts appear in relation to each other in the amount required by the human body, (they) will be increased or decreased (anyway) and health will be preserved";

II. This is not the case. "Perhaps, along with the maintenance of the quantities of the species relative to each other, there should be a specific amount (in the natural-biological standard - S.X.) - measure for each of the species, which is not comparable to the other species." Hilt is a wet, fluid body, which is what food first turns into. Hilt is divided into two groups according to Ibn Sina's interpretation: “Мақтовга сазовор хилт”, ”яхши хилт”, “табиий хилт”,”сифатли хилт” ва б.

II. "Bad quality", "bad quality", "bad quality", "low quality", etc.

1. In medieval Eastern medicine, as well as in the works of Ibn Sina, the basis of physiology and pathology was based on the doctrine of four body fluids -Khilts. According to this teaching adopted by the Greeks, especially Hippocrates, the human body has four types:кон (sanguis)

2. sputum (phlegma)

3. bile (shole)

4. there is trade (melan chole). It was believed that blood is in arteries and veins, phlegm is in the brain, bile is in the liver, and blood is in the spleen[6].

Ibn Sina described different fluids in the body:

a) blood

b) lymph

c) tissue fluids

g) fluids in body cavities: liquor, synovial fluid, exudate, transudate, ichor, pus, etc., which appear in various pathological conditions, tried to be included in the doctrine of "hilts" consisting of four kinds of wetness. According to Allomah, there are two types of blood - hot and wet in nature

1. Natural blood is red;

2. Not smelly;

3. Very sweet.

According to Ibn Sina's interpretation, unnatural blood is of 2 types: 1. Sometimes his change from a good temperament is not caused by any interference, but by the deterioration of his temperament, for example, his temperament becomes cold or hot.

2. Another kind of blood mixed with bad quality. This second type of blood is divided into two: either it is contaminated with blood from the outside and passes into the inside. or (that corrupting) evil appears in itself, for example, some of the blood becomes putrid, the liquid part becomes yellow bile, and the thick part becomes black bile. One or both of these remain in the blood. Both types of the same (unnatural) blood differ according to the substance added to it, and according to the groups of phlegm, mucus, bile, watery parts of that substance, sometimes it is thick, sometimes liquid, sometimes very black and sometimes colorless. Also, there is a change in smell and taste, it becomes salty and sour.[7]

In Ibn Sina's time, natural blood and unnatural blood, natural phlegm and unnatural phlegm [8], was able to distinguish between natural bile and unnatural bile, between natural trade and unnatural trade.

Ibn Sina continues and emphasizes such an important point: "...you find the blood itself mixed with other impurities, and when the blood is drawn out and put into a vessel, it is separated from the impurities:

It is felt that it separates into a foam-like lump, which is bile;

It is felt that it separates into a lump similar to egg white, this is sputum;

It is felt that it is divided into pieces, such as scum and sediment, this is a trade;

It is felt that it separates into a water-like mass, which is water, the excess of which is excreted in the urine...water is needed for the dilution and passage of food. But joy comes from eating and nourishing drinks. The meaning of our word "nutritional" is to say that it is similar in strength to the body. Something similar in strength to the human body is not a simple but a complex body, and water is simple. For this reason, the thinker said again and again that the strength of the human body does not depend on the amount or lack of blood, but on the good quality of the blood.

In the work of Ibn Sina, "mizoj" means a specific quality, a natural standard. "As a result of the elements influencing each other with their energies, a suitable mood (clear, good quality-S.X.) arises for all of them. This mood is the client”[9]. It is not so difficult to understand that it is a question of the compatibility of four different qualitative elements with each other through

[6]Qarang.: O‘sha kitob 450 – bet.
[7]O‘sha kitob. 24-bet
[8]O‘sha kitob 23-30 betlar.
[9] Ibn Sina Abu Ali.Kanon vrachebnoy nauki.Kn.1.Tashkent.1981.S.11.

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 7 | Issue: 12 | December 2022 - Peer Reviewed Journal

proportional amounts. Blood, bile, trade and lymph fluid [10] it is in a certain amount for each organism - "specific number"; These four liquids form a unity-norm in the measure of proportionality with each other in certain quantities. In this case, the standard of health is manifested in the form of a relationship of four independent standards. Abu Mansour al-Qumri confirms his teacher Ibn Sina's opinion in this regard and says: "In the moderate state of the human body, these four opposite qualities stop at a certain limit."

Ibn Sina, much earlier than Hegel, was able to show that the ratio of attributes is also a norm. Another advantage is that Unlike Hegel, he was able to show from examples in practical medicine several centuries before him that not only the ratio of two qualities, but also the ratio of several different qualities can be the norm.

The temperament may be in a moderate or severe state. If the client is in moderation, the body is healthy, if out of moderation, disease will appear. The best condition for a person is for the client to be moderate. Such a person is healthy. If the opposing qualities are not moderate, but tend to one of the two sides, such as heat or cold, wetness or dryness, or both, the person is out of moderation and disease occurs in the body.

"Moderation is the most correct distribution of the elements in the whole body or in one member of the client's body and in the most correct proportion according to the mood and mood of the client." "Moderation" means proportionate amounts, proportion, ratio. When we say "quality blood", we mean the quantitative ratio of all elements included in the composition of blood, such blood is equal to moderate quality. This quality of blood corresponds to quality bile, quality cells, fluids, etc. should be.

The physician must understand from the natural scientist that moderation of this kind is impossible to find, let alone misogyny of man or of the human body. In modern terms, two people with the same qualitative and quantitative indicators cannot be the same in nature.

Abu Ali ibn Sina separated the meaning of the words "Taodul" and "moderate": The doctor should know that the word "moderate" used by medical scholars in their debates is not derived from the word "taodul" which consists of equality of weight, but which consists of equality in distribution. ” from the word "adl".[11]

The word "Taodul" means equality in weight. Ibn Sina in his book "Urjuza fit-t-tib" ("Urjuza about Medicine"), more precisely, in his poetic treatise, nine types of mizaj:

1. hot customer;
2. cold;
3. dry;
4. wet;
5. hot and dry;
6. hot and wet;
7. . cold and dry;
8. . cold and wet client
9. . showed a moderate temper.

Plain temperament	Complex temperament
hot	Hot and dry
cold	Hot and wet
Dry	Cold and dry
wet	Cold and wet
Moderate temperament	

It distinguished three levels of each of the nine different clients. According to Ibn Sina, every living being has a natural norm corresponding to its type. The creature with the most moderate client is man. His great achievement was that he was able to show his concept of the client from generality to individuality on the example of the human body. Every person has his own (individual) mizoj, the allama says, and it is rare or impossible for another person to have the same mizoj.[12]

Thus, although the people of the world belong to the same species, it is impossible to meet two people with the same internal standard.

1. Individual (specific) misogyny of a person;
2. Each member has his own friend;
3. Gender misogyny in man;
4. Age misogyny in a person;
5. Misogyny of food;

[10]Xilt – inson tanasidagi suyuqliklar tushuniladi.
[11]O‘sha kitob. 11-bet.
[12]O‘sha kitob. 13-bet.

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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Volume: 7 | Issue: 12 | December 2022 - Peer Reviewed Journal

6. Misogyny of the seasons;
7. Medicine misogyny;
8. Misogyny of clothes;
9. Plant misogyny;
10. Animal misogyny;
11. Misogyny of different regions, etc.

Scholar detailed the members' clients:[13]

hot temperament in the body	Cold temperament in the body	Wet temperament in the body	Dy temperament in the body
Heart	Phlegm	Phlegm	Hair
Blood	Charvi	Blood	Bone
Liver	fat	Oil.	Uncle
Lungs	Moy	Charvi	Rich people
Meat	Bone	The brain	Shares
Muscle	Uncle	Spinal cord	Curtains
Talaq	Rich	Nipple	Arteries
Kidney	Shares	Testicle meat	Veins
Artery	Curtains	Lungs	Motor nerves
Vienna	Nerves	Liver	Sensory nerves
Skin	Spinal cord	Talaq	Skin
Palm skin	The brain	Kidneys	
(moderately sensitive)	Skin	Muscles	
		Skin	

The sharp point of Ibn Sina is that he was able to clearly explain that depending on the age change of the body, its quantity and quality indicators also change, changes in physical strength, and the beginning of heat reduction after the age of cessation of growth. He explained all aspects of the science of "Physiology of Youth" in modern medical terms. A child, a teenager, a mature person, an old person, a man and a woman, a young girl and a young man differ from each other in terms of the quantity and quality of their bodies. Physical strength is not always the same in a person. Years have an effect on the human body. Human age was divided into four groups according to qualitative and quantitative indicators:

I. "Growth" or "adolescence" period - it lasts from birth to 30 years;
II. "Period of cessation of growth or "youth period" is the period from 30 to 35-40 years;
III. "Sinking age" is a period of partial strength, lasting on average from sixty years;
IV. "The age of sinking with impotence" includes the period until the end of life.

The period of "growth" or "adolescence" is divided into:

I.1. Infancy;
I.2. Childhood;
I.3. "Growth period";
I.4. "Adolescence" and "Adult" age;
I.5. Puberty is the age before growth stops.

If we explain with a philosophical phrase, Ibn Sina explained the organic system of norms in the human organism on a dialectical basis. Every young person has his own misogyny[14]. A teenager's misogyny is more moderate than a child's moderate misogyny. But he has a dry mood towards a teenager, and a hot mood towards the elderly and middle-aged. The main organs of an old man are more dry than those of a teenager and a middle-aged man, and he is the wetter of the two with foreign wetness that soaks (his body). "Age Physiology" (Vozrastnaya fiziologiya), "Age Anatomy" fully explained the branches of medicine when explained in modern terms. The first book, the third educational part of "The Law" (consisting of six chapters) is "About the Event of the Elderly", and it is not a mistake to say that it is a unique collection of information about the age standard of the elderly.

The first season. A general word about the senior event The second season. About feeding the elderly The third season. About wines that old people drink The fourth season. Obstructions in the elderly [15] очиш ҳақида

The fifth season. About massaging (massaging) the elderly

The sixth season. About physical education of the elderly.[16]

[13]Abu Ali Ibn Sino.Tib qonunlari. I-kitob. Ikkinchi nashri. T.:O‘zbekiston SSR “Fae” nashriyoti. 1983. 17-18 betlar.
[14]O‘sha kitob. 22 – bet.
[15]Tiqilmalar - tromblar
[16]O‘sha kitob. 353-356 betlar. Hurmatli talaba! Oila a'zolaringiz orasida keksa qorindoshingiz bor, albatta. Ular parvarishiga mazkur kitob sahifalaridagilar o‘rganish rosa asqotadi.

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In short, Ibn Sina perfectly described a healthy lifestyle for the elderly and its specific aspects.

For example, if we take the age standard mentioned by Ibn Sina, the arterial blood pressure indicators are different at different ages:

Age	Indice of the arterial blood pressure [17]
16-20	100/70-120/80
20-40	120/70-130/80
40-60	Up to 140/90
60 ёшдан катта ёшдагиларда	150/90 гача

In addition to the age norm, there are also normal limits of blood pressure readings. Expressing this graphically, it looks like this:

Hypothony	indices of the lower norms	Norm (most favourable norm)	Indices of the upper norms	Hyperthony
100/60	100/60-110/70	110/70-130/85	130/85-139/89	140/90

Depending on the age of the person, the client becomes cold and dry. Compared to women, men's misogyny is warmer. Those who have a moderate body and a cold temperament when they are young become very cold when they get old. The eyelids of such people are slightly swollen, their movements are sluggish and they are more prone to sleep. Those who are misogynistic when they are young and hot tend to feel better when they are older, even if their clients become cold. Their bodies will be thin. In order to pay attention to maintaining the body's moderation, it is necessary to eat figs, ripe grapes, dates, and sweet pomegranates.

One of Abu Ali Ibn Sina's services to the category of norm is that he clarified which of the norms is the criterion for the other while explaining the law of treatment: “There are three laws of treatment with drugs. The first is the law of selecting drugs according to mood (ie, quality), i.e. according to heat or cold, wetness or dryness. The second is the law of selecting the quantity of drugs. This second law is divided into the law of weighing and measuring drugs, and the law of measuring (drugs) moods, that is, of determining the degree of heat, cold, etc. The third is the law of determining the time of consumption of drugs”[18]. It can be noticed that the scholar paid serious attention to the criterion of norms and the proportionality of norms. Ibn Sina's treatise "Urjuza fi - t- tib (Fil-l-fusul al-arba'a)" - "Medical Urjuza concerning the four seasons of the year" is directly dedicated to the category of quality, quantity and standard, and we will not make a mistake.

In order to be healthy, a person must strictly follow the seven balances in his body. These are:

"1. Body (organism) proportion;
2. Choice of food and drink;
3. Freeing the body from excess;
4. Maintaining the correctness and proportionality of body parts;
5. Making the air drawn into the nose sufficient and good;
6. Choosing the clothes to be worn according to the environment;
7. Moderation of physical and spiritual actions”[19].

Ibn Sina writes about the second of these seven balances:

"Don't drink too much, listen,
Be content with yourself, sometimes have a glass,
Don't let your hand be in the garden,
It is enough to drink once a month.”[20]

If a person drinks a certain amount of some drinks every day, he consumes some in a very small amount; especially when consuming may, it is recommended that this rule be strictly followed. About the norm of drinking oil:

May is an enemy to the drunk and a friend to the sober.
A little is good, a lot is bad.
If there is a lot of it, the damage is not small,
If there is little, then there is a lot of interest.[21]

[17] Систолик босим (юқори кўрсатгич) юрак қисқарган вақтдаги босимни кўрсатади;
Distolik bosim (pastgi ko‘rsatkich)- yurak bo‘shashgan vaqtdagi bosimni ko‘rsatadi.
[18] Abu Ali Ibn Sino. Tib qonunlar. Abdulla Qodiriy nomidagi xalq merosi nashriyoti. 1992.128-bet.
[19] Abu Ali ibn Sino. Kanon vrachebnoy nauki.Kn.1.T.:Fan.S.296-297.
[20] Aql ensiklopediyasi.Ikkinchi kitob.Toshkent. “DAVR PRESS” NMU.2015.473-bet
[21]Ibn Sino Abu Ali. Tarjimai holi. She'rlar. Tibbiy doston (Urjuza). T.:O‘zbekiston KP Markaziy Komitetining nashriyoti.1981. 48-bet.

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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Volume: 7 | Issue: 12 | December 2022 - Peer Reviewed Journal

One of the standards of human health is the amount of cholesterol in the blood, if the amount of cholesterol is 120-180 MB (medical unit-S.X.), this is the standard of health. An increase of 200 medical indicators indicates that the arteries are contaminated. The amount of cholesterol that accumulates in blood vessels is directly proportional to the amount of cholesterol in the blood. In the past, the cholesterol level was measured in medical units, so our above opinion is correct. But according to today's measuring index, the normal level of cholesterol is 5.1. An indicator higher than 6.2 (this indicator is the upper limit of the norm - S.X.) indicates that cholesterol has increasedThe amount of sugar in the blood of the human body; arterial blood pressure; the amount of cholesterol and alpha-cholesterol in the body, body weight, more specifically, the amount of body fat and the quantitative indicators of prebet, beta-lipoprotein and triglycerides in the blood[22]- these are all internal natural standards of health. A person can be healthy when these indicators are within their limits.

CONCLUSION

1. Modern medicine has recognized that people should take nutrients and drugs that are against their clients. Anyone who feels good about any food has a moderate appetite. The nature of food and medicine should be properly adapted to the human body.

2. The client is the internal immanent natural norm of a person. It is this internal immanent norm that is the criterion (criterion) for external factors.

2. Abu Ali Ibn Sina recommended to determine the misogyny of people based on 10 signs.[23]

3. Ibn Sina distinguished two types of material basis related to the human organism. The first of these are the relatively stable body parts of a person in the course of the organism's life activity; the second is the constantly changing material basis, which provides the body's vital activity.

Ibn Sina understood the dialectical relationship between human health (physical and mental health) and nature and its ecological factors. In fact, only when a healthy person is a product of a healthy nature, life indicators of the biosphere - a natural-ecological norm - are preserved, about 8 billion people on the planet Earth can live peacefully, without environmental risks. Only perfect people understand the norms of nature and do not allow them to be violated in life.

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[23]Мазкур белгилар Ибн Синонинг "Қонун" биринчи китобида бор, уларни ўз дафтарингизга қайд этинг. Ўз мизожингизни, оила аъзоларингиз мизожларини аниқланг.

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 7 | Issue: 12 | December 2022 - Peer Reviewed Journal

FINE ART IN THE EPICS OF YUSUF AND ZULAIKHO

Jumayeva Dilnoza Tursunpo'latovna
Associate Professor of the Department of Uzbek Language and Literature, Uzbekistan State Art and Culture Institute
Based on the Review by H.A. Jabbarov, Professor of the Tashkent State University of Uzbek Language and Literature, Doctor of Philology

ANNOTATIONS
The article is devoted to the centuries-old ideological development of the epics of Yusuf and Zulaikho. The article analyzes the epics of Abdurahman Jami, Durbek and Olim Devon, Andalib and Kholis on this topic. They were created in different periods. The themes and ideas have also changed. While Jami's Yusuf and Zulaikho is based on purely romantic and mystical themes, Durbek's Yusuf and Zulaikho is one of the few epics in the history of Uzbek literature that embodies secular life and reflects the spirit of the times. In these epics, a variety of arts are skillfully used, the article provides examples of art used in the epics.
KEY WORDS: *epic, short story, romance, rhetoric, plot, surah, art, religion, idea, book.*

About 120 of the artistic arts used in prose and verse are given in works on Eastern poetics. These artistic arts are divided into two groups (verbal and spiritual arts) in the textbooks of classical poetics, and only in some studies into three groups (also divided into common arts). In all the epics of Yusuf and Zulaikha that we are studying, the poetic arts belonging to these three groups are skillfully used, and they give each verse a special gloss and charm.

The authors of the epic "Yusuf and Zulaikha" use poetic arts with great skill to reveal the idea presented in the work, to describe the inner world of the characters, to logically develop the flow of events, and most importantly, to ensure the attractiveness of the language of the work. Also, each creator expresses his observations about the world and man, his comments on morals, and his attitude to worldly and divine phenomena in the basis of artistic arts.

Let's pay attention to the poetic hours used in Durbek's epic:

Dedi ogʻosiki: – ne kulmak turur?
Senga bu hasrat ila oʻlmak turur.
Dedi: – koʻrunur menga sunʼi iloh,
Sizni dedim oʻzuma pushtu panoh.
Tengrini unutub oʻshal lahza pok,
Ushbu gunoh uzra boʻlurmen halok.

Using the art of question-and-answer, the artist conveys from the language of young Yusuf that it is not permissible for a person to rely on another person, that being a "refuge" is a characteristic of God alone. According to Durbek, considering someone other than God as a god and seeking salvation from others will lead to man's destruction.

Lek bu base mehnat-u javr-u jafo,
Chekkumizu koʻrgumiz oxir vafo.

Here, through the art of tazad, the poet pointed out that enduring trials and tribulations, patience, ultimately brings good to a person. In his opinion, in order to reach maturity and happiness, a person needs high fortitude and strong patience. A person who is patient will surely be blessed.

In another place, the poet quotes the following stanza:Sabr bila tengri berur komi dil,

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Volume: 7 | Issue: 12 | December 2022 - Peer Reviewed Journal

Sabr qil-u sabr qil-u sabr qil.

By using the art of repetition, the poet draws the reader's attention to patience. According to the verse, only those who are patient will find peace and happiness in this world. The poet repeatedly points out that patience is the most important factor in finding peace of mind.

A number of beautiful examples of poetic arts can be found in the translation of Abdurahman Jami's epic by Ogahi. Since it was written in a romantic-mystical spirit, the epic mainly depicts the sufferings of lovers and lovers, their heartbreaks, experiences, joys, worries, and aspirations. In the chapter "Zulaikho became a Maghrib mashriq with the beauty of his quality and lineage, but he was a thousand degrees above him" Ogahi praises the beauty of Zulaikha and uses several examples of poetic art in it with high skill. will cry The poet first briefly dwells on Zulaikha's lineage and exaggerates that she is the owner of immense beauty:

Sochi el boshig‘a solib qaro shom,
Yoyib jonlar qushi qasdig‘a ham dom...[1].

The poet describes Zulaikha's image with great skill through the art of kitabat (lettering):

Hamul lavh ustida ham yozdi vojun,
Ajab bay’at bila mushkin ikki nun.
Ul iki nunning ostida ikki sod,
Yozibdur sun’i kilki birla ustod.
Hamul nun haddidin to halqai mim,
Alif chekti burundin xo‘b ta’lim.
Alifga kelturub sifrin damonning,
Birin o‘n aylab oshubi jahonning.
Labi xandondin aylab jilvagar sin,
Tili ila mim aqdin ochti tahsin.

The fact that Ogahi is a skilled poet is also seen when he can use several poetic arts in one stanza:

Beli noziklik ichra o‘ylakim qil,
Demay, nozik erur qildin dog‘i, bil.

In this stanza, the poet uses the art of ruju in two ways: in the first stanza, in the second stanza, when the stanza is read in full, it is seen that he uses the art of ruju. As a result, it conveys a subtle meaning through a beautiful artistic image. There are many such situations in the saga.

Oriental poetry is rich in colorful artistic arts. Their use shows the vocabulary of our language, and at the same time, the unique skills of the creator. "Rawzai Asror" is also a work that shows the poetic skill of Olim Devona, that he is a poet with high creative potential. In order to convincingly convey his opinion to the reader, references to historical names known to our people can be found in many places in the works of Olim Devona:

Layliparvar Qays, lek etsang shior,
Shirin aytar: Ko‘hkan o‘lsang nigor.

Another example:

Kishvar ma’nida qilib hukmron,
O‘ylaki bir Xusravi sohibqiron.

In verses, the art of talmeh is used, in which the true lovers of literature and famous people of history are described with a unique artistry.

Tajnis is one of the traditional arts used in Eastern poetry in "Rawzai Asror". It is known that the art of tajnis (or jinos) has been used in Turkish literature for a long time, and it is a means of effectively expressing a certain idea or image. A vivid example of this can be found in the following verses of the epic:

Borcha Zulayxo boshida toshurub,
Aytur edi toshlarig‘a tosh urub.

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The following verse confirms that the poet was able to create unique examples of allusion while painting the portrait of Zulaikha:

Borcha parichehra, gulandom ham,
Zulfi qaro erdi, bodom ham.

Quoting a proverb or its content in poetic verses also served to reveal the creator's ideological and aesthetic intention. A typical feature of the parable is that it is used to prove and support the expressed idea. Scientist Devona also uses this classical art for this purpose. The poet's appeal to this art gives the reader pleasure in reading the work, that is, the reader vividly imagines the events of the work:

Telba erur ul ki, bu so‘z anglamas,
So‘z bu ki, sulton so‘ngakin xorlamas.

Olim Devona does not fail to vividly portray the cute character of Zulaikha, the hero in love. Because this work brings pleasure to the artist. In the following example, it can be seen that the poet used the art of literature in this regard.

Bo‘yla og‘zi ramzidin ko‘nglumda mavzui fikr erur,
Ruxsor uzra xolu xat “Nun” surasidek zikr erur.

It is known that the Arabic alphabet consists of straight and curved, arc and circular letters. Scientist Devona also approaches these forms with the method of comparison and uses the art of literature to express his views.

Kokilining torig‘a yuz jon asir,
Jon demakim, din ila iymon asir.

The fact that the Qur'anic theme, sung and penned by artists for centuries, sometimes in verse, sometimes in prose, finds its expression in the work of Olim Devona is a noteworthy event for the treasure of our literature. The saga of the talented poet differs from the works of other artists who wrote on this topic due to its uniqueness and unique use of artistic image tools.

Poetic arts have a special place in Andalib's story. Even if the author did not write the story entirely in verse, beautiful examples of artistic arts can be found in each poem included in the work.

It is known that Andalib created the story in a simple, vernacular language. That's why the arts used in it gave the work a special sincerity, a folk spirit, unlike others. For example, let's pay attention to the art of tashbih (simile) used in the following poem:

G‘ofil o‘lub karvonimni ko‘churdum,
Qo‘limdagi shunqorimni uchurdum,
Ayrolig‘ni sharobini ichurdum,
Diydor qiyomatga qoldi naylayin... [2].

Or:

Nola qilib yuragimni kuydirma,
Xazon urub xirmanimni yel oldi...

Of course, there is no doubt that the work written on the basis of such popular and simple similes will take a deep place in the reader's tongue. In other places of the story, the poet effectively uses such metaphors.

Husni uses the art of education to depict the image of a mother who is suffering from the nightmares that are happening to her son, but who is trying to convince her child of a bright tomorrow:

Bo‘lmag‘il dunyoda g‘amboda, erursan oftob,
Ko‘rgali chun orazing oylar tutar yuzga niqob...

According to Anvar Hojiahmedov, husni ta'lil is a poetic reason for the phenomenon described in literary works [3]. In this story, the mother is very depressed, but she cheers up her son and makes him look like the sun. Because the sun revives all nature with its warm love. Moreover, through this comparison, the poet once again

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mentions that she is unequaled in beauty. And it is precisely these characteristics of Yusuf that cause the jealousy of the nine stars.

The poet uses exaggeration to describe the fiery love of Zulaikha, his emotional experiences:

Yonib ishq otashi kuydirdi, ayb etmang Zulayxoni,
Umidim vaslidin andog‘, yana fasli bahorim bor.

Andalib discovered a unique way of using proverbs in his poems. This can be seen in the following example:

Otamiz Odamdin qolg‘on bir so‘z bor –
“Ko‘rdugung o‘rt, ko‘rmading so‘zlama”... [4].

The above proverb is repeated in every second verse of this ghazal. Through this, the poet draws the reader's attention to the fact that a person should not speak about what he heard in order to gain the trust of others, but only about the events that he saw with his own eyes and became convinced of.

When writing his poems, the artist strives for variety, that is, to use various poetic arts. The following is an example of unique art. "Do you know poetry?" According to his book, Hazrat Navoi effectively used this art based on the use of double words in his works [5]:

Yusuf aytur: omon-omon, Zulayxo,
Bilmasunlar yaxshi-yomon, Zulayxo... [6].

Andalib paid great attention to the art of rhyme in order to ensure the perfect level of melodiousness and musicality of the work. His following ghazal is proof of our opinion:

Tamosho aylasam dunyo, ko‘ngul anda bo‘lur shaydo,
Og‘olarim qilur parvo, mening husnu kamolimg‘a...
Yusuf bechorag‘a fursat, otojonim bering ruxsat,
Og‘olarim manga ulfat, xabardor o‘lsa jonimg‘a.

Through this ghazal, the poet created a strange rhyme by using rhyming words in two places of the verse. It can be seen that Andalib uses this method of rhyme in many places in the poems of the short story.

Kholis follows Andalib in some places regarding the use of artistic arts. However, Kholis does not exactly copy that art, but reworks and develops it. A clear example of this can be seen in the following quote:

Budur odam atomizni ayg‘onlari,
Yaxshi anglang so‘zlarini siz o‘g‘lonlari,
Barchamizga sunnat erur qilg‘onlari,
Ko‘rgoningni ayt ko‘rmaganing so‘zlama...

As mentioned above, a similar poem using the art of irsolu masal also existed in Andalib's story. If Andalib used it in a ghazal, Kholis included this saying in his poem in the murabba genre. The poet emphasizes this proverb like Andalib, i.e. does not repeat it exactly in every second verse, but quotes it in different ways:

Bilganingni ayt bilmaganing so‘zlama...
Qilg‘oningni ayt qilmaganing so‘zlama...
Topganing ayt topmaganing so‘zlama...
So‘rg‘oningni ayt so‘rmaganing so‘zlama.

Kholis also uses the art of talmeh at the beginning of the story to indicate the essence of the work and its idea to the reader from the beginning:

Kezib olamni Majnun Laylisiga yetmayin o‘ldi,
Edi Farhod ish boshiga Shirin uchun o‘ldi.
Eshiting Vomiqu Uzro alar ham bu yurug‘ bo‘ldi,
Ayo do‘stlar, alarni barchasi oxir pano bo‘ldi.

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The reader who sees the names in these verses will immediately realize that the love of Yusuf and Zulaikha is as magnificent as theirs. In the story, you can find a very attractive, unique, unique version of tazad art. Its uniqueness lies in the fact that the poet skillfully composed a series of wisdoms through this art:

Ki, muhabbat so‘ngidin rohat kelodur,
Faqirlik so‘ngidin davlat kelodur.
Yig‘ini oqibat bir kulmog‘i bor,
Kimki g‘amgin bo‘lsa shod o‘lmog‘i bor.
Sabr qilmoq dedi rahmon ishidur,
Vale shoshmak hama shayton ishidur.

In another place, the poet manages to make a beautiful play on words by using the arts of taqrir and tajnis together:

Bir-biri bilan turgon quchushib,
Yana lablaridin bir-bir o‘pushib.

The use of pairs of words in both lines of this verse, first of all, created the art of repetition. The double use of those words is an example of tajnis art.

In conclusion, it can be said that these short stories, which appeared in the field of Turkish literature, stand out because they are mature works in all respects. No matter from which angle they are studied, they show their new aspects. That's why such masterpieces have reached our times without being forgotten for centuries, and they will undoubtedly be the focus of researchers' attention even after that.

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EPRA International Journal of Research and Development (IJRD)
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ATTITUDE TOWARDS SOCIAL ADJUSTMENT AMONG THE UNDERGRADUATE STUDENTS OF PURULIA DISTRICT

Sarif Ansary[1], Karim Ansary[2], Anasuya Adhikari[3]
[1] *B.Ed. Student, Vasunddhara B.Ed. & D.El.Ed. College, Purulia, West Bengal, India*
[2 & 3] *Research Scholar, Sidho-Kanho-Birsha University, Purulia, West Bengal, India*

Corresponding Author: Anasuya Adhikari

Article DOI: https://doi.org/10.36713/epra11930
DOI No: 10.36713/epra11930

ABSTRACT

The present study was aimed to assess the social adjustment of the undergraduate students of Purulia District, West Bengal. Descriptive survey type research method was adopted by the researchers to conduct this study. All the undergraduate students of Purulia district are taken as the population of this study. The study analyzed the data from 276 undergraduate students. Out of this, 154 are male and 122 female. They all belong to the two undergraduate colleges which are affiliated to Sidho-Kanho-Birsha University, Purulia. A self-made 'Social Adjustment Inventory' was used by the researchers to collect responses from the students and 't'-test was used to test the significant mean difference between the maintained variables. The findings of this study revealed that there is no significant difference existing between male-female, rural-urban, rural male-urban male and rural female –urban female undergraduate students of Purulia District regarding their attitude towards social adjustment.

KEYWORDS: *Adjustment, Social Adjustment, Undergraduate, Inventory*

1. INTRODUCTION

Social adjustment is the achievement of balance in social relationship usually aided by the appropriate application of social skills [1]. As social beings, we live in a society, where we possess opinion about others and vice versa. Everybody crave to be accepted and recognized by the society. Doing so, we try to behave in accordance to the norms of society in order to adjust with others. When a person as an eligible member of a society can properly follow or adhere to the custom, values, rules, etc. established by that society, the person is called a socially adaptable or adjustable person. Not all people in a society follow the same rules and regulations pertaining to the society. But, in order to live as an accepted member, one should adhere to the customs and values of that society. Generally, when a person is able to meet their social needs by living in society through establishing good relations with their surrounding social circumstances, it is called social adjustment. Social adjustment refers to an individuals' adaptation in social relationships with other people, both inside and outside the school, as reflected in the individual's attitude and behavior [2]. Social adjustment is a psychological process. It frequently involves coping with new standards and values. Social adjustment as per the technical language of psychology, means getting along with the members of society as best as one can be called adjustment. [3]. One of the main aims of the current education system is to help students acquire social adaptability, which will help the students to adapt or adjust themselves successfully to different social circumstances. So, teachers, parents, administrators, and all the people who are involved in education need to have proper knowledge or idea about the social adjustment of the students. Social adjustment discussed as an intervention targets for programs intended to improve students' social competence and academic achievement [4]. A significant positive correlation exists between social adjustment and academic achievement. It means that the higher the students' social adjustment the better and more desirable academic achievement they would have [5]. Social adjustment is found independent of academic achievement and parent-child relationship [6]. The social adjustment positively affects the academic well-being of the students [7]. The school academic achievement of the students is greatly influenced by the social adjustment of the students [8]. Urban students showed favorable attitude towards social adjustment than the rural students. [9]. social adjustment impacts later academic adjustment differently for male versus females. Sometimes this difference was one of magnitude, such as stronger relations between social acceptance and GPA for females [10]. The key objective of this present study is to speculate the level of social adjustment of undergraduate students. So, the findings of this study will be helpful for college teachers and administrators in a way to enable them to know the importance of different factors that may influence the student's social adjustment on the college campus. This study will able them to help students in better ways to work for the improvement of their social adjustment at the college campus.

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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2. LITERATURE REVIEW

Mistry, R. S., Vandewater, E. A. & Huston, A. C. et al. [11] conducted a study on economic well-being and children's social adjustment: The role of family process in an ethnically diverse low-income sample. The findings of this study revealed that the family process is a critical mediator of the effects of economic hardship on children's social adjustment. Lower levels of economic well-being and the corollary elevated perceptions of economic pressure indirectly affected parenting behavior through an adverse impact on parental psychological well-being. Huntsinger, C. S. & Jose, P. E. [12] investigated the personality and social; adjustment of Chinese American and European American adolescents. The results of this study found that the Chinese American and European American adolescents became more similar to each other over time through developmental and acculturative processes. Another finding of this study also revealed that the Chinese American youth continued to report lower levels of Extraversion than European American youth. Domitrovich, C. E. & Bierman, K. L. [13] examined the parenting practices and child social adjustment: multiple pathways of influence. The findings of this study found that the parenting practices were related to peer-reported social behavior, peer dislike and child social problem-solving. Another finding also revealed those children's perceptions of their parenting experiences were related to their social problem solving and their reported social distress. Chen, X., Liu, J. & Ellis, W. et al. [14] investigated social sensitivity and adjustment in Chinese and Canadian children. The results of this study showed that the pattern of relations between social sensitivity and indexes of adjustment differed in the two countries. Another finding also showed that social sensitivity was negatively associated with social and school adjustment and positively associated with psychological distress in Canadian children. Devi, R. K., Nakulan, V. & Devi, M. A. et al. [15] studied spiritual intelligence and adjustment of arts and science students. The findings of this study revealed that there is a significant relationship existing between the variables among college students and a significant positive relationship existing with spiritual intelligence and adjustment among adolescents. Dufur, M. J., Percel, T. L. & Mckune, B. A. [16] conducted a study on capital and context: Using social capital at home and at school to predict child social adjustment. The results of this study showed that social capital at home and school can be calculated as separate constructs and that capital at home is more influential than capital at school. Robertson, R. V., Mitra, A. & Delinder, J. V. [17] examined the social adjustment of African-American females at a predominantly white Midwestern University. In this study, respondents were chosen through non-probability sampling and answered open-ended questions cantering on social adjustment factors. In this study, researchers concluded that African-American students have been shown to adjust better in academic settings in which the course work is either cantered around or at least includes to some extent an Afro-centric focus and they were raised in a predominantly white community typically experiencing very few problems in a biting. Lukomski, J. [18] studied the perception of deaf college students toward social-emotional adjustment. The main objective of this study is to examine the differences between deaf and hearing students' perceptions of their social and emotional adjustment. A significant difference has been found between deaf and hearing students who are transitioning to college concerning their social-emotional adjustment. Nelson, J. R., Lane, K. L. & Benner, G. J. et al. [19] conducted a study on the best evidence synthesis of literacy instruction on the social adjustment of students with or at-risk for behavior disorders. The results of this study suggested that effective literacy instruction does not emerge to have a collateral effect on the social adjustment of children. Kolaitis, G., Giannakopoulos, G. & Tomaras, V. et al. [20] conducted a study on self-esteem and social adjustment in depressed youths: 'A randomized trial comparing psychodynamic psychotherapy and family therapy'. The results of this study reflected that self-esteem and social adjustment plays a significant role in depression among children with chronic stress and both dimensions may enable coping with a stressful situation, such as parental psychopathology, child maltreatment, family conflict and lack of parental warmth, affect and support. John, T. J. [21] examined the Canadian financial imperialism and structural adjustment in the Caribbean. The findings of this study revealed that many of the independent states in the region would see left governments replaced with reactionary traditional ones and a small number of states confessing themselves to be socialist. Patel, S. A. & Jansari, A. [22] conducted a study on the social adjustment of students in the context of gender and habitat. Researchers found that there is no significant difference in the mean scores of social adjustment among the boys and girls students. Another finding also revealed that there is no significant difference in the mean scores of social adjustment among the student's habitats in urban and rural areas. Wadhawan, K. [23] conducted a study on the emotional, social and educational adjustment of senior secondary students of Panchkula. The results of this study showed a significant difference in the emotional adjustment of senior secondary school students that is girls are found emotionally more adjusted than boys of Panchkula. Kundu, M., Saha, B. & Mondal, B. C. [24] studied adjustment of undergraduate students in relation to their social intelligence. The overall finding of this study revealed that male and female as well as science and humanities students of undergraduate level did not differ significantly with regards to their adjustment ability. Paramanik, J., Saha, B. & Mondal, B. C. [25] conducted a study on adjustment of secondary school students with respect to gender and residence. The result of this study showed that there is no significant difference exists between rural and urban secondary school students regarding their level of adjustment. But another finding of this study also revealed that the mean adjustment score of girls is higher that of boys secondary students. Kar, D., Saha, B. & Mondal, B. C. [26] examined the relationship of emotional intelligence and adjustment ability of the higher secondary school students. The overall findings of this study revealed that emotional intelligence affects home, school and peer adjustment of the higher secondary students. Kar, D. & Saha, B. [27] examined the relationship of leadership style and adjustment ability of the

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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undergraduate students. The findings of this study explored that adjustment ability is significantly correlated with the leadership style of undergraduate students.

From the entire review, it is observed that no such kind of research study is conducted, particularly on this topic such as attitude towards social adjustment among the undergraduate students in Purulia District of West Bengal. Therefore the researchers selected such kind of study for investigation.

3. OBJECTIVES OF THE STUDY

The main purposes of this study are:

i. To find out the difference between male and female undergraduate students regarding their level of social adjustment.
ii. To find out the difference between rural and urban undergraduate students regarding their level of social adjustment.
iii. To find out the difference between rural male and urban male undergraduate students regarding their level of social adjustment.
iv. To find out the difference between rural female and urban female undergraduate students regarding their level of social adjustment.

4. HYPOTHESES OF THIS STUDY

Hypothesis is the tentative statement about the solution of a problem. its plays an important role in every study. in order to conduct this study clearly and smoothly, following null hypothesis has been framed.

$H_0$1: There is no significant difference between male and female undergraduate students regarding their level of social adjustment.
$H_0$2: There is no significant difference between rural and urban undergraduate students regarding their level of social adjustment.
$H_0$3: There is no significant difference between rural male and urban male undergraduate students regarding their level of social adjustment.
$H_0$4: There is no significant difference between rural female and urban female undergraduate students regarding their level of social adjustment.

5. METHODOLOGY

There are several methods of conducting research. The choice is determined by the nature of the problem. The present study attempts to study the social adjustment of undergraduate students of the Purulia District concerning their residential areas and gender. This type of study cannot be studied in an artificial setting. Nor it is desirable to do so. In the present study, the descriptive method was found to be the most appropriate one for the social adjustment level of undergraduate students to their residential areas and gender as they exist in a real-life situation. The present study was conducted through descriptive survey type research. This method was used by the researcher to study the social adjustment of undergraduate students with respect to their residential areas and gender.

5.1 The population of the Study

All the students of the undergraduate level of Purulia district, West Bengal are the population of this study.

5.2 Sample and Sampling

In this research stratified random sampling method was used for selecting the samples for this study. A total number of 276 (Boys-154 and Girls-122) student samples were selected from two colleges representing one college from urban and at least one from rural areas of Purulia District, West Bengal.

5.3 Tool Used for the Study

In order to collect responses from the students, following tool has been administered by the investigators: Social Adjustment Inventory standardized by the researchers: In order to assess the attitude of undergraduate students towards social adjustment, the investigators framed a Likert type Social Adjustment Inventory with 36 statements. Out of 36 Statements there are 21 questions taken as positive to social adjustment. And rest 15 questions are taken as negative to social adjustment. Scores were given to the positive questions are 5 for Strongly Agree, 4 for Agree, 3 for Neutral, 2 for Disagree, And 1 for Strongly Disagree. And Scores were given to the negative Questions of Social adjustment are 1 for Strongly Agree, 2 for Agree, 3 for Neutral, 4 for Disagree, & 5 for Strongly Disagree. The investigators standardized this questionnaire by following slandered procedure. The reliability of the scale was determined by calculating reliability coefficient on a sample of 200 undergraduate students. The Cronbach's alpha value was found 0.73 which is greater than 0.70. The Cronbach's alpha value proved the acceptability of the overall scale reliability [25].

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6. ANALYSIS AND INTERPRETATION OF DATA

Data analysis and interpretation are important parts of every research activity. In this chapter, the researchers have tried to analyze and interpretation the collected data.

6.1 Descriptive Statistics

Here we present our descriptive data (Table 1) in the form of mean and standard deviation (S.D) for the scores of attitude toward social adjustment among undergraduate students.

Table 1

Dimension	P	Mean	S.D
Male	154	123	12.93
Female	122	120.69	10.67
Rural	91	120.97	10.36
Urban	185	122.80	12.77
Rural Male	39	124.76	12.52
Urban Male	115	122.93	13.09
Rural Female	52	118.13	7.30
Urban Female	70	122.6	12.32

6.2 Inferential statistics

Inferential statistic makes the use of various analytical tools to draw inferences about the population data from sample data. For the present study, we have constructed 't'-value (Table 2) to analyze the mean difference between the pairs.

Table 2

Pair of Composition	N	df	Mean Difference	't'-value
Male	154	274	2.31	0.06
Female	122			
Rural	91	274	1.83	0.23
Urban	185			
Rural Male	39	152	1.93	0.44
Rural Female	115			
Urban Male	52	120	4.47	0.02
Urban Female	70			

7. TESTING OF HYPOTHESES

7.1 Testing of $H_0$1

Table 2 shows the difference (t = 0.06, df= 274) between the male and female undergraduate students regarding their attitude toward social adjustment which is statistically not significant at the 0.01 level of significance. Therefore, the $H_0$1 is accepted. Hence, it may be also interpreted that there are no significant differences exists between male and female undergraduate students of Purulia District regarding their attitude toward social adjustment.

7.2 Testing of $H_0$2

Table 2 shows the difference (t = 0.23, df= 274) between the rural and urban undergraduate students regarding their attitude towards social adjustment which is statistically not significant at 0.01 level of significance. Hence, the $H_0$2 is accepted. And, it may be also said that there are no significant differences exists between male and female undergraduate students of Purulia District regarding their attitude toward social adjustment.

7.3 Testing of $H_0$3

The mean (M) of attitude towards yoga education scores for rural male and urban male undergraduate students are 124.76 (S. D= 12.52) and 122.93 (S. D=13.09) respectively and the calculated value between this pair is 0.44, Where the critical value of df 152 is 1.97 and 2.60 at 0.05 level and 0.01 level of significance respectably. So it is found that the calculated value is less than the critical value at 0.01 and 0.05 levels of significance. Thus it is evident that there is no significant difference exists between rural male and urban male undergraduate students of Purulia District regarding their attitude toward social adjustment.

7.4 Testing of $H_0$4

The mean (M) of attitude towards yoga education scores for rural female and urban female undergraduate students are 118.13 (S. D= 7.30) and 122.6 (S. D=12.32) respectively and the calculated 't'-value between this pair is 0.02, Where the critical

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value of df 120 is 1.98 and 2.62 at 0.05 level and 0.01 level of significance respectably. So it is found that the calculated 't'-value is less than the critical value at 0.01 and 0.05 levels of significance. Thus it is evident that there is no significant difference exists between rural female and urban female undergraduate students of Purulia District regarding their attitude toward social adjustment.

8. DISCUSSION

The overall findings of this study revealed that there is no significant difference exists between male and female undergraduate students regarding their attitude towards social adjustment. This result was supported by Srivastava, P. S. [26] Beri, A. & Bhat, S. A. [27] and opposed by Mondal, C. [1] Rani, T. S. & Jayasree, D. [28]. Rural and urban undergraduate students of Purulia District are also significantly related to each other. This finding was supported by Ghatak, R. [29] D'souza, M. H. & Tripati, N. [30] and opposed by Jayachandran, P. [31]. Another findings of this study also revealed that there is no significant difference exists between rural male and urban male, rural female and urban female undergraduate students of Purulia District regarding their attitude towards social adjustment. But Table-1 showed that the mean scores of male undergraduate students and female undergraduate students are a slight difference. The mean score of male undergraduate students is a little higher (123) than the female undergraduate students (120.69), which proved that the male undergraduate students of Purulia District showed a slightly more favorable attitude toward social adjustment than female undergraduate students of Purulia Districts. The findings of this study also found that the attitude of rural female and urban female undergraduate students of Purulia District towards social adjustment is equal. But the mean score found a slight difference between this two. The Mean score of urban female undergraduate students (122.6) is better than that of rural females (118.13). So, it can also be said that urban female undergraduate students and better social adjusted than rural female undergraduate students.

9. CONCLUSION

Based on the above discussion it can be concluded that the attitude of male and urban female undergraduate students of Purulia District towards social adjustment is better than the female and rural female undergraduate students respectively. Therefore, parents, school teachers and other administrators need to pay more attention to the social adjustment of female and rural female undergraduate students. Since, a healthy social adaptation applies to every person living in a society. This social adaptation determines the future of an individual and its existence. Social adaptation is a process by which a person helps himself to adapt to his locality or environment. If a person fails to adapt to his environment, he would face numerous problems in every step. This type of problem causes the person to wrap himself in a way that will cause various mental problems in him. Gradually, if not treated psychologically, he will soon lose his existence in this society and fade away in this world. Hence, it can be said that proper social adaptation leads to a healthy life, while a healthy life makes a person's behavior useful and developing.

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EPRA International Journal of Research and Development (IJRD)
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REVIEW ON MOISTURE CONTENT: A STABILITY PROBLEM IN PHARMACEUTICALS

Shivam Lad, Dr. Sachin Narkhede, Dr. Shailesh Luhar, Dr. Anuradha Prajapati

Article DOI: https://doi.org/10.36713/epra11911
DOI No: 10.36713/epra11911

ABSTRACT

Liquid water is associate in many different manufacturing processes including pharmaceutical processes. Moisture can affect the thixotropy of semi-solid dosage forms as well as the chemical stability, crystal structure, powder flow, compaction lubricity, dissolution rate, and polymer film permeability of solid dosage forms. While water content measures how much water is in a sample, moisture analysis tells us how wet or dry a sample is. It's crucial to measure this because substances other than water can make a sample moist. Additionally, it has an impact on unit operations that naturally depend on the quantity and quality of water present.

As a result, it is crucial to understand how moisture affects each component's unique qualities, including those of the active substances and excipients. In this article, the significance of moisture content in pharmaceuticals is highlighted. Moisture is measured using a variety of techniques, and changes caused by moisture are shown for a number of product and process attributes.

KEYWORDS: *Moisture Content, Pharmaceuticals, Determination of Moisture Content, Importance, Moisture Induced Changes.*

INTRODUCTION

In each of the three states, water is present in every natural setting (solid, liquid, and gaseous). Liquid water is participant in many different manufacturing processes including pharmaceutical processes. Water is almost always the base of liquid dosage forms, however it can also be found in semi-solid dosage forms as hydrophilic ointments. It is typically crucial to maintain a low water content in solid dosage forms since a high water content could adversely influence the product's physico-chemical, chemical, and microbiological stability.[1]

However, water is frequently used in manufacturing processes (such as wet granulation, spray-drying, coating processes, etc.), but the majority of them must be eliminated in subsequent manufacturing steps. The tablet is the most popular dosage form, and the majority of its weight is typically made up of various excipients.[1]

Manufacturing pharmaceutical tablets effectively and successfully depends on the characteristics and behaviour of the powder. A powder's water or moisture content is a crucial characteristic. A powder's "hygroscopicity" is a measurement of its capacity to absorb atmospheric water vapour. Different physical states of water can exist in powders:

(1) Monolayers or multilayers of adsorbed material on the particle surfaces,
(2) Water that has condensed on a particle's surface.
(3) The particle physically absorbed water, or
(4) Chemisorbed water.

Numerous aspects of the powder are impacted by the condition and distribution of the water, which are dependent on the powder and the volume of water absorbed via exposure to humid air. The link between the water content of a substance and the humidity of the contacting gas is displayed by moisture adsorption isotherms. Five categories were initially used to classify adsorption isotherms.[2]

There are many ways to analyse moisture, including using an oven or a chemical titration. Ovens can reach high temperatures, but they can also be cumbersome, inaccurate, and easily cause samples to burn. Chemical titration can be challenging with materials

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that have little moisture content to begin with, especially if the moisture is brought on by liquids other than water. A moisture analyzer is portable, evenly heated, and capable of measuring moisture contents precisely.

A pharmaceutical product's physical characteristics, which in turn affect the chemical reactivity and binding properties that determine the shelf-life of the product, can be negatively impacted by an excessive or inadequate moisture content. The moisture level is crucial for the crystallisation, agglomeration, and chemical form of these substances during the manufacture of tablets since pharmaceutical products may also contain substances that are dangerous when in touch with the skin or when inhaled. So, a standard quality check in the pharmaceutical sector involves moisture analysis.[3]

WHY IS THE MOISTURE CONTENT OF PHARMACEUTICALS SO IMPORTANT?

When mixing and granulating raw materials, such as Active Pharmaceutical Ingredients (APIs) and excipients, moisture content is a crucial consideration. The consistency of blended powders and overall flow characteristics are influenced by moisture content. Moisture content is one of the quality criteria for finished tablets and capsules that takes into account mechanical strength, solubility, and overall shelf-life stability.[4]

Numerous pharmaceutical goods' characteristics are impacted by moisture content, which has a direct impact on how tablets are manufactured. These include lubricity, dissolving rate, compaction, powder flow, chemical stability, crystal structure, and polymer film permeability.[3]

The consistency and stability of tablets are impacted by moisture. A tablet will crumble and get agglomerated with powder if there is too much moisture present; the opposite is true if there is not enough moisture. Excipients that are powdered may not flow properly if they are excessively wet, and excessive moisture may cause some active pharmaceutical ingredients (APIs) to crystallise or change their form. Numerous techniques, including as freeze drying, fluid bed drying, compaction, granulation, and extrusion, are used to create solid dosage forms. The quantity and quality of water present affects each of these processes. Individual active components and excipients' chemical and physical characteristics might also be impacted by moisture.[3]

The texture and binding abilities of a chemical are significantly influenced by moisture. For instance, effervescent medication must dissolve in a glass of water rather than between the user's fingers and must remain intact in the packaging. If the product is a powder, it shouldn't bunch up or it won't mix properly. For some people, a tablet may be too sticky or crumble into dust, and a syrup may be too thick to swallow (or too watery, in which case the patient must drink more to achieve the same effect).[5]

Due to the particular nature of the equipment and delivery methods, moisture is also crucial for manufacturing and distribution. For instance, syrup with excessive moisture may leave residue in machinery that may eventually clog it and cost money to repair. A pill with insufficient moisture risked crumbling before packaging.[5]

Every step of the process, including packaging, is tested because moisture analysis is so crucial. Since most people don't consume the entire contents of a bottle or may have a long-term prescription, it's important to ensure that medication will remain stable and resistant to water, dust, or humidity incursion while still packaged.[5]

Hydrophobic medications are frequently manufactured with hydrophilic polymers added to create miscible mixtures known as amorphous solid dispersions. From the standpoints of processing and stability, the interaction of moisture in these blends is a crucial factor. Moisture issues include:

- Due to the moisture content, the flow of the API and excipients was not as anticipated.
- Differences in the weight of batches of finished tablets or raw materials
- Clogging or caking in process equipment
- Moisture-permeable packing materials that maintain the content’s stability
- The undesirable effect of moisture on chemical stability (e.g. antibiotic hydrolysis) and physical stability (e.g. change of dissolution rate)
- Drugs having functional groups such as esters, amides, lactones, or lactams, as well as many polymers, undergo hydrolytic breakdown.
- A powder or granulate's angle of repose is not what is expected. Water can fill voids between particles, altering electrostatic attraction and ultimately affecting the characteristics of how powder flows.

Manufacturers must take into account both the finished product and the effect of moisture in bulk materials. Since moisture content varies from batch to batch, uniformity in formulation demands an accurate method for determining moisture content. Methods for determining moisture must be quick, reproducible, and accurate in order to be useful.[3]

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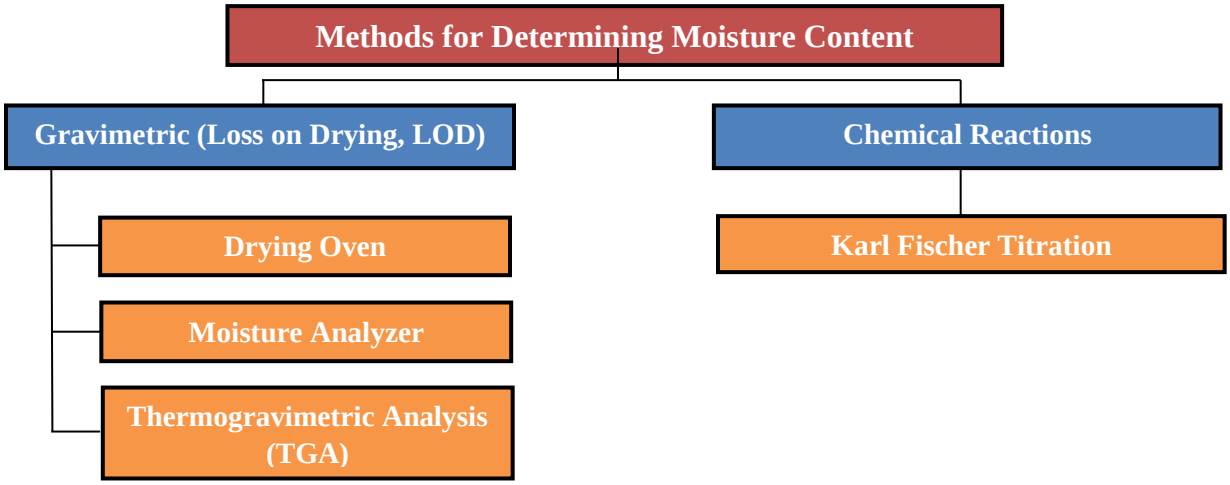
DETERMINATION OF MOISTURE CONTENT



Gravimetric Methods

A sample is weighed before being dried using a suitable temperature programme until the sample mass reaches a "constant" value in a gravimetric method. This measurement approach seems straightforward and trustworthy at first glance. However, the following significant issues surface:[6]

- Release of water and other volatiles can also contribute to mass loss (gravimetric methods are not specific with respect to water). In addition, the material may degrade while drying and emit breakdown byproducts. Therefore, one can only use gravimetric methods to estimate the water content if one can make the assumption that decomposition processes do not occur and that other volatiles are absent. Therefore, only the loss on drying (content of moisture and volatiles) may be assessed using gravimetric methods, and even then, only if the sample doesn't break down while drying.[6]
- The drying process is influenced by the drying conditions, including temperature, ambient pressure, and ambient humidity. In theory, it takes a long time for a substance to dry completely. Therefore, a drying criterion is established in practise (for instance, with the halogen moisture analyzers). This is done by setting a maximum value for the mass loss, Δm_{max} that occurs in a certain time interval, Δt. If the mass loss rate $\Delta m/\Delta t$ is higher than $\Delta m_{max}/\Delta t$ after a certain time, the material is not dry, below this value it is considered to be “dry” (see Figure).[6]

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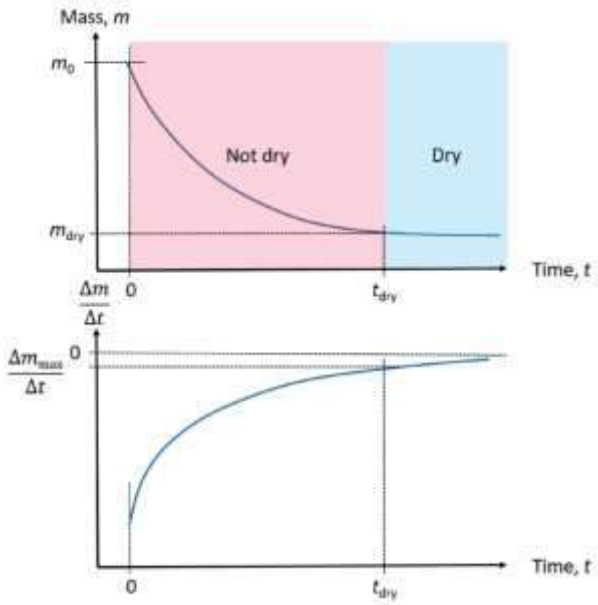

- The amount of moisture or water is often expressed as a percentage of the sample mass. Concerning the reference mass, the following question arises: Does the reference mass relate to the dried product's mass or the mass of the sample before drying? The "dry mass" is referred to as the reference mass in the latter scenario. But after drying, is the sample indeed "dry"? The mass of the sample before drying is frequently chosen as the reference mass due to practical considerations. This is presuming that the sample's moisture content does not alter throughout sample preparation, such as by water evaporation or adsorption, which would have an impact on the sample preparation process.[6]

Drying Oven

Using a drying oven is the traditional method for calculating the moisture content (also known as loss on drying). By using heated (and ideally dry) air in an oven set at a specific temperature, one (or more) samples are dried (sometimes also under reduced pressure). After drying, the difference between the beginning mass and the finished mass is used to compute the moisture content. USP 40 [1] contains a comprehensive description of the process. It takes a lot of time (usually 2 to 3 hours) and effort to determine the moisture content using a drying oven (the weighing process is done manually). However, the most crucial approach for determining moisture content or loss during drying is still the usage of drying ovens.[6]

Moisture Analyzer

The moisture content (also known as loss on drying) of a material can be ascertained in 5 to 15 minutes if halogen moisture analyzers are employed. The sample is heated to the drying temperature (usually 105 °C) using halogen heating technology in a halogen moisture analyzer like the METTLER TOLEDO HX204. The mass of the sample is continually measured throughout the heating phase and the ensuing isothermal phase, and the sample's drying curve is presented. The corresponding moisture content is determined when the drying criterion specified in the measurement method is attained.[6]

In actuality, the sample temperature can vary from the set drying temperature by a few degrees. The samples are heated by the absorption of the radiation generated from the halogen lamp, which is primarily in the IR range. This is owing to the various absorption capabilities of the materials to be studied. The photo of METTLER TOLEDO HX204 Halogen Moisture Analyzer can be seen in Figure.[6]

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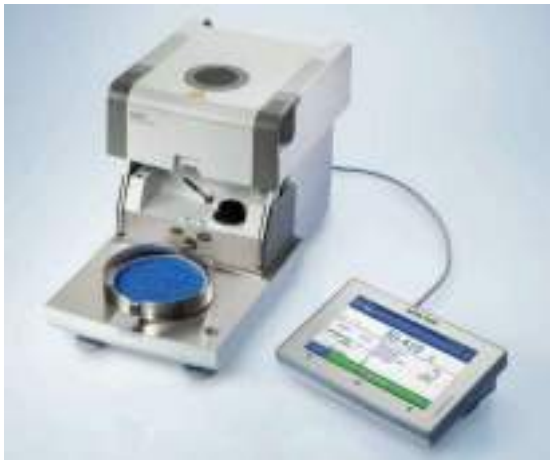

The halogen light is used to heat the sample to the proper drying temperature, and it is subsequently dried for, typically, 10 minutes. There is constant measurement of the sample mass. The drying standard that the user has chosen determines the moisture content.

Thermogravimetric Analysis

Thermogravimetric analysis can also be used to measure moisture contents (TGA). TGA measurements can be made using significantly smaller samples than drying ovens and halogen moisture analyzers. Additionally, it is also possible to take measurements while the pressure is lowered. Water can be discriminated from other volatile chemicals or from decomposition products if the TGA is connected to an evolved gas analysis instrument, such as a mass spectrometer MS or a Micro GC/MS. In this situation, the TGA approach is unique to water. [6]

CHEMICAL REACTIONS

Karl Fischer Titration

Titration is a technique used in analysis to determine the concentration of a certain component in a solution (the sample solution). In a chemical reaction, the substance in question in the sample solution is titrated with a standard solution (the titrant) of known composition. On the basis of the stoichiometry of the reaction with the standard solution, the volume of the standard solution consumed is measured, and the unknown concentration of the chemical in the sample solution is determined. The reaction equation states that water can be found using the so-called Karl Fischer titration (KFT):

$$ROH + SO2 + 3\ RN + I2 + H2O \rightarrow (RNH)\cdot SO4R + 2\ (RNH)I$$

where RN is a base (often imidazole) and ROH is an alcohol (typically methanol)[16]. The Karl Fisher titration can be used as a technique to selectively determine water content if the sample doesn't contain any other compounds besides water that react either directly or indirectly with the Karl Fischer reagent.[6]

HOW DOES MOISTURE AFFECT THE STABILITY OF MEDICINE?

A product could decompose after a week or two on the shelves due to too much moisture. This could be disastrous for medicine delivered to distant places because too much moisture can result in germs or fungus.[5]

Additionally, too much water may result in hydrolysis, a chemical reaction in which water dissolves a substance's bonds. For instance, paediatric penicillin medicines are crucial and must be stocked in children's hospitals, yet they are unstable in water. This means that before administering the solution to patients, doctors and nurses must mix a stable form they have on their shelves with water.[5]

Doctors can better learn how to administer various substances to patients by seeing how they respond to moisture and water. A medicine is not a good fit for something like an IV bag if it degrades more quickly in water.

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Through the magic of chemistry, substances that could be dangerous or toxic alone can be combined to produce advantageous results (for example, common aspirin has compounds that can cause gastric bleeding if not mixed with other chemicals). But that depends on the combination properly keeping together. That link might be broken by insufficient or excessive moisture, which would cause compounds to separate or mix in the wrong amounts and cause undesirable reactions.

Moisture and hydrolysis can slow down the drug's metabolism in addition to preventing the medicine from degrading before it is consumed. Anesthetics typically consider hydrolysis; the less prone a drug is to hydrolysis, the longer it can stay stable. On the other hand, inactive compounds may take longer to degrade and be disposed of if a chemical takes too long to reach hydrolysis.[5]

Chemicals can change in a variety of ways through different reactions, some of which may have unfavourable effects. Pharmaceutical labs offer very detailed instructions regarding the ingredients of their products, including the amount of water and moisture. It appears on a quality control checklist along with many other things. To get quick, accurate, and reproducible results, a good moisture analysis process is necessary, as is the use of the appropriate equipment.[5]

WATER CONTENT LIMIT IN PHARMACEUTICALS

Limits on water and moisture content vary depending on the medication type, delivery method (such as syrup, tablet, or powder), and how it will be combined. Specific guidelines and limitations governing acceptable moisture and water content in their products should be provided to the manufacturer and quality testing laboratories. A generic prescription drug or a comparable product made for children rather than adults may have a slightly different formulation, so it's crucial to double-check everything. Laboratories should establish and maintain their own databases because information on medication stability isn't usually shared or generally accessible.

Formulation is made simpler by the common use of percentages to describe water and moisture contents. Additionally, since the formulation of the same product should be proportional, percentages guarantee that the numbers stay the same regardless of how much is tested.[5]

MOISTURE-INDUCED CHANGES

A research done by Carstensen and Van Scoik has shown that moisture can have a significant impact on a substance's physical characteristics[7]. Lyophilization, which creates an amorphous, highly porous solid cake, was used to create amorphous sucrose spheres. In the first several days of the investigation, its moisture content rises significantly.

However, the moisture absorbed by the porous amorphous sucrose phase eventually led to the collapse of the structure and a corresponding decrease in moisture content because of the dramatically reduced amount of surface that could convert to the crystalline form at a rate that was dependent on relative humidity. In addition to the physical change from a loose to a denser amorphous form, the amorphous sucrose was also demonstrated to be humid. This illustration is in line with the increased focus on solid state changes brought on by sorption.

Dealing with variations in surface area as a continuous variable is one of the challenges posed by a thermodynamic approach of solids. Copeland and Young offered an early thermodynamic solution to this issue in 1961.[8] These authors provided a foundation for understanding the thermodynamic properties of powder systems as continuous functions by interpreting a change in the number of moles of adsorbent as the addition or removal of particles with the same specific surface area.

This method was utilised by Wu and Copeland to characterise barium sulphate. They emphasised that although thermodynamic variables of adsorbents are typically fewer than those for adsorbates, this can be misleading and found convincing evidence to refute the "inert" adsorbent idea.[9] Adsorbents' characteristics are those of the corresponding component on average. This approximation is appropriate if the adsorbed moisture is evenly distributed throughout the solid. The thermodynamic changes would be much increased if the process were adsorption and only the top few layers of the adsorbent were affected. The analysis of the thermodynamic characteristics of the adsorbent, which is a promising field for further study, is almost seldom done in medicinal studies.

Zografi talks about the need to address changes in adsorbent. He notices that water can function as a plasticizer and lower the glass transition temperature when it is incorporated into the bulk structure of a solid. The mobility of molecules or portions of molecules in the system increases above the glass transition point.[10] The collapse and subsequent crystallisation of lyophilized cakes, direct compaction properties, powder caking, permeability of coatings and packaging materials, and solid state chemical stability are just a few physical chemical processes that can be explained by the transition from the "glassy state" to the "rubbery state" and are of interest to the pharmaceutical industry.[9] The single most significant recent development in creating a framework for comprehending and forecasting the impact of moisture is the recognition of this reality.

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Incorporating the degree of crystallinity into the experimentally obtained monolayer capacities of microcrystalline cellulose, Zografi and Kontny discovered values that were largely consistent. This outcome confirmed the theory that water is restricted to the noncrystalline portions of microcrystalline cellulose.[10]

CONCLUSION

It is crucial to describe how moisture affects the unique features of active substances and excipients. Moisture can and does affect these properties. Gravimetric measurements always reveal the entire volatile content (including water) of samples and are LOD techniques. KFT or physical procedures, on the other hand, are unique for water and determine the water content of samples.

The method, as well as the measurement and evaluation criteria, are what determine the moisture content's (or water content's) outcome (temperature program, drying criterion, etc.). In addition, the release of moisture and decomposition frequently coincide, making it more challenging to determine the true moisture level. As a result, Moisture content should be determined at each level in the pharmaceutical industry to obtained a product of predetermined specification.

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SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
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IMPROVING DIGITAL MAPPING FOR LAND MONITORING

Niyazov Q. X.[1] , Turaev R.A.[2] , Abdurakhmanov S. N.[3]
[1] *"Ozdaverloyiha" state scientific design institute independent researcher*
[2] *"Ozdaverloyiha" state scientific design Institute , Director General ,*
[3] *Tashkent Institute of Irrigation and Agricultural Mechanization Engineers (TIIAME)-National Research University*

ABSTRACT
The purpose of the research is to create digital maps for monitoring agricultural land areas and to implement navigation surveying works based on them using a mobile application and to improve the method of summarizing field work through a server. The object of the research: agricultural land in the territory of Fergana region. The subject of the research is the monitoring of cultivated land areas, the analysis of land information by creating and updating electronic digital maps in the ArcGIS program .
KEYWORDS: *land area monitoring, ArcGIS software , mobile application, field work server.*

INTRODUCTION

From the developed countries of the world, the share of agricultural land in Canada, Finland and Sweden is 7.4% of the total land area. This figure is 9.7% in our republic. Therefore, effective use of irrigated agricultural lands and their control through regular monitoring are among the urgent issues of today. Due to the digitization of agricultural land, the need to use modern software, online platforms and mobile gadget applications for monitoring land areas, systematic control of land accounting is emerging. In this regard, it is important to improve the method of creating digital maps for land monitoring.

In the world, the monitoring of agricultural land and the inclusion of information about land in the geodatabase based on innovative methods, the acquisition of land information using online platforms, and the integration of field research into the geodatabase are being carried out. In this regard, special attention is paid to studies aimed at obtaining quick information on agricultural land monitoring and forming a unified geodatabase on land and land users.

Implementation of a number of measures in the fields of land formation, cadastre and land monitoring, in particular, digitalization of all data collected as a result of land monitoring, development of the agricultural land control system, and certain results are being achieved. In particular, the Decree of the President of the Republic of Uzbekistan of January 28, 2022 No. PF-60 "On the development strategy of the new Uzbekistan for the period of 2022-2026 " sets important tasks for " developing an electronic database for inventory and monitoring of their implementation". given In the implementation of these tasks, it is important to carry out scientific research on the formation of a geodatabase by monitoring agricultural land using modern methods and keeping land records.

Decision of the President of the Republic of Uzbekistan dated February 24, 2021 No. PQ-5006 "On additional measures to improve the system of use and protection of agricultural lands", Cabinet of Ministers of the Republic of Uzbekistan dated January 14, 2022 No. 22 "Monitoring of agricultural lands This thesis serves to a certain extent the implementation of the tasks defined in the Decision "On approval of regulatory legal documents regulating the activities of land protection and land creation" and other regulatory legal documents related to this activity.

LITERATURE REVIEW

The level of study of the problem. To the industry belongs to scientific literature analysis that's it shows that the village In addition to foreign scientists, scientific researches were carried out in our republic on land monitoring, land formation, land cadastre, use and control of land resources. Therefore, the theoretical and methodological foundations of the land resources management and land formation aspects of the problem were obtained from foreign scientists - S.Thenkabail, M.Thomas, W.Ralph, W.Jonathan. A study by Lam Dao Nguyen et al. Also, S.N. Volkov, V.V. Vershinin, A.S. Cheshev, A.O. Khomutov, M.V. Maksumova, G.E. Larin, and other scientists of land cadastre and land monitoring researched the theoretical and methodological foundations, while V.A. Evsegneev, N.V. Koryagina, N.Yu. Ulskaya, V.B. Jarnikov, Yu.S. Larionov, G.L.

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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Zemlyakova studied the theoretical and methodological foundations of digitalization of processes , S.A. Lipsky, P.M. Sapojnikov and others developed.

Scientific research on land formation, land cadastre, land monitoring, accounting and geovisualization of land information in the geodatabase in Uzbekistan S.Avezboev, M.I.Rozimetov, R.A.Turaev, A.R.Babajanov, Q.Rakhmonov, M. Scientific works were carried out by M. Bozorov, F.R.Khamidov, A.N.Inamov, S.B.Roziboev and other local scientists. Scientific studies on mapping information in a geodatabase and creating agricultural maps E.Yu. Safarov, I.M. Musaev, O.R. Allanazarov, S.N. Abdurakhmonov, R.Q. Oymatov, A.N. Inamov and other scientists those who conducted their research and achieved positive results.

Today, researches are carried out on modern methods of land monitoring in different regions of our country, connecting field work to a geodatabase, increasing work productivity based on the type of navigational survey, monitoring field work using online platforms, and integrating information about arable land directly into the server based on mobile applications. not sufficiently studied. Therefore, there was a need to improve the method of creating digital maps for agricultural land monitoring.

METHODOLOGY

Tasks of the research: improvement of the method of updating digital cards of agriculture ; improvement of the method of integration of monitoring field research works into the geodatabase through the server ; development of a type of navigation camera for monitoring agricultural land areas ; Development of a method of monitoring agricultural land areas using the " Land Surveying " mobile application .

Research methods. In the research process , methods such as land monitoring , geospatial linking of vector layers , geovisualization of thematic layers based on cartographic methods , remote sensing of agricultural lands , coding using JavaScript programming language, and digitalization of information were used.

The scientific novelty of the study:the method of updating existing electronic digital maps of agricultural lands on a scale of 1:10,000 based on decoding has been improved; in order to improve the effectiveness of field research work, the method of integrating the monitoring work carried out on the ground with the help of the GSM network into the geodatabase has been improved; taking into account the format unit of the thematic layers, a method of navigational photography in the area of land users has been developed; Land Surveying " mobile application was developed for monitoring agricultural land based on JavaScript programming language.

Practical results of the study: available electronic digital maps of agricultural land at a scale of 1:10,000 improved decryption update ; Monitoring of land areas using the GSM network was integrated into the geodatabase ; in order to improve the efficiency of field research in the area of land users, the method of navigational surveying was improved ; " Land Surveying " mobile application was developed for monitoring agricultural land areas by regional experts based on modern technologies.

Reliability of research results. The conducted scientific researches were conducted using the geoinformation system, research was conducted on improving the accuracy of agricultural maps by using geodetic- cartographic methods, field work was carried out based on systematic analysis , the scientific basis of the obtained results, the created mobile application was used in practice, it was carried out on the basis of methodological manuals, the Republic and it is explained by the fact that scientific innovations were discussed at international scientific-practical conferences , scientific articles were published in foreign and local journals recommended by OAK, and the results were applied to production organizations.

Research of the results scientific and practical importance . Research of the results scientific importance village modern farm land areas improving the method of monitoring based on techniques and technologies, navigational surveying method legal and organizational based on documents i methodology work exit and of them use with explained. Research of the results practical significance , carried out Server-based integration of field research into a geodatabase and village economy him by monitoring his land control digitized method to implement directed state programs work on the way out use for service does _

RESULTS

In order to ensure the stability of relations related to agricultural land, to fundamentally improve the system of state monitoring, use and protection of agricultural land, and to widely introduce information and communication technologies in the field, the President of the Republic of Uzbekistan dated September 7, 2020 "Fundamentally improving the system of land accounting and state cadastre management" Decree No. PF-6061 on measures" was signed. This decree organizes work on monitoring agricultural land and crops, placing agricultural crops, ensuring the protection of agricultural land, determining the standard value and quality indicators of agricultural land, conducting soil inspection, increasing soil fertility, conducting research on soil science and geobotany. issues have been put forward. At the same time, the foundation for full digitization of agricultural lands has been created by establishing the Department of Development of Digital Technologies in the Agricultural Sector and the Department of Development of Geo-Information Technologies. In order to expand the scope of use of digital maps of agriculture, the independent researcher has conducted large-scale scientific research on creating agricultural maps and systematizing them into a format unit.

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To date, agricultural maps have been created using decoding, correction and decoding methods. These processes created problems related to manpower, costs and duration of work. If we take the example of a specific research object, the total land area of Fergana district of Fergana region is 620 sq. km. In addition, there are enclave and exclave regions (Fig. 1).

Figure 1. Statistical data on regions and the scheme of administrative-territorial division in the section of districts of Fergana region

**Source:* https://fergana.uz/

Based on these conditions, 10 experts are required to conduct field research within 30 days to create an agricultural map of this district. 30 million on average for bed and food for 10 specialists for 30 days. soum is required. In addition, a total of 10 million for transport costs. soum should be allocated. After the fieldwork decoding process, it takes 10 personnel to digitize the fieldwork in camera conditions for 15 days. 10 specialists were paid an average of 30 million for their work during 15 days. Soum funds should be allocated. Therefore, it is required to conduct field work within 6 days for the correction of digitized maps by experts who conducted field work above. For this, a total of 6 mln. Soum funds are required. These economic calculations were determined by the researcher using the timing method (Table 1).

Table 1.Economic indicators for carrying out field research in decoding, correction and decryption methods (available)

T/r	Research method	Number of specialists, people	Required time, day	Funds for expenses, soums	Salary for employees, soum
1	Decoding and correction	10	36	30,000,000	50,000,000
2	Digitization	10	15		30,000,000
3	Transportation costs			10,000,000	
4	Electricity costs			5,000,000	
5	Total	10	51	51,000,000	80,000,000
		General		**131,000,000**	

**Developed by researcher*

131 mln. was spent on the field and camera work carried out using these methods to create agricultural maps in electronic form. Soum funds are required. In addition, on average, 10 specialists will have to work for 51 days to digitize the land area of 620 square kilometers.

In order to expand the scope of creation and use of agricultural maps by an independent researcher, he developed a method with high economic efficiency, unlike the above methods, and introduced it to production organizations.

The proposed method is based on the creation of high-resolution electronic maps by surveying, surveying and digitizing agricultural land based on remote sensing material. Using space photographs of the researched area, orthophotoplanes are created

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and entered into the coordinate system by performing geospatial mapping in the ArcGIS program. In the implementation of this process, it is required to carry out field research in the section of the orthophoto plane area using the GNSS (Global Navigation Satellite Systems) geodetic device (Fig. 2).

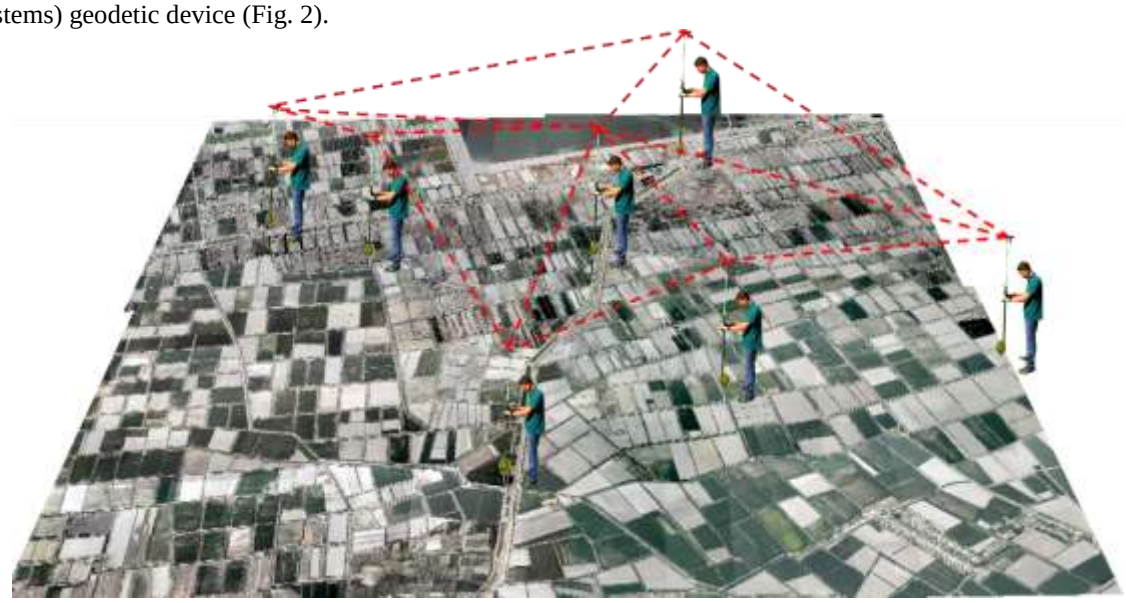

Figure 2. Field survey work carried out using the GNSS geodetic device

**Developed by the author*

Using the GNSS geodetic device, the coordinate values of the characteristic points were determined based on the geographic coordinate system (Table 2).

Table 2. The catalog of coordinates of fixed points determined according to the results of field research

id	*Layer type*	*Wide*	*Go away*
0	Tochka	71° 27' 16.082" E	40° 35' 51.103"N
1	Tochka	71° 31' 25.018" E	40° 36' 41.246"N
2	Tochka	71° 33' 43.221" E	40° 34' 10.202"N
3	Tochka	71° 31' 20.381" E	40° 33' 56.791"N
4	Tochka	71° 29' 33.426" E	40° 33' 18.450"N
5	Tochka	71° 28' 17.319" E	40° 35' 25.477"N
6	Tochka	71° 30' 23.707" E	40° 35' 21.712"N

**Identified by the author*

Examples of characteristic points are duikers, aqueducts, buildings and structures (fixed objects) (Fig. 3).

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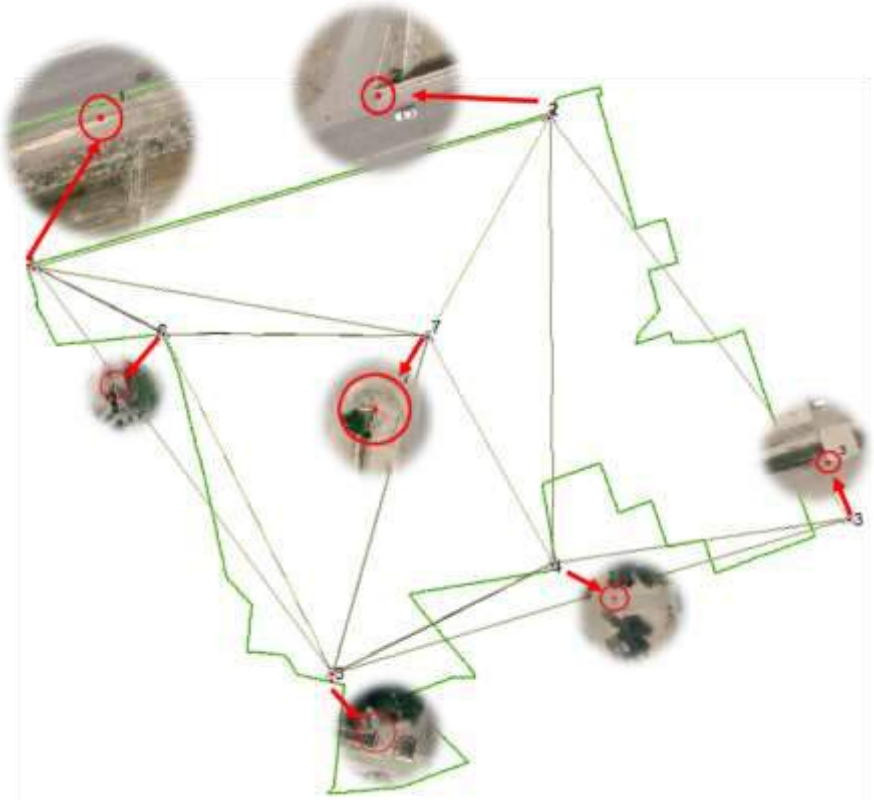

Figure 3. Characteristic points whose coordinates are determined using the GNSS geodetic device
**Developed by the author*

After the fieldwork was completed, software alignment was carried out. Reduction and centering errors in a total of 7 control points were identified and eliminated. The identified 7 control points were found from the orthophoto plane and transformed by geospatial linking. During the transformation, the orthophoto plane was stored in the computer memory, and when using the software belonging to the family of the geoinformation system, it was ensured that it fell into the coordinate system. Therefore, one of the important tasks is to include orthophotoplanes in the coordinate system (Fig. 4).

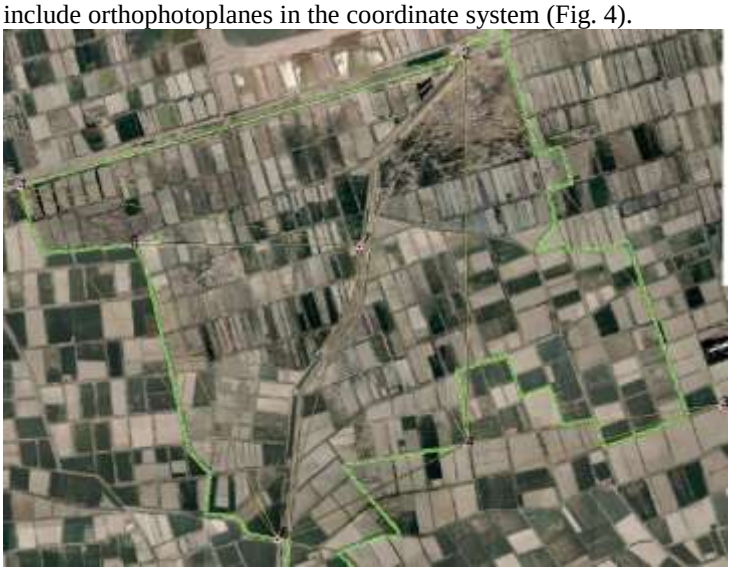

Figure 4. The process of geospatial linking of orthophotoplanes based on the coordinate system
**Developed by the author*

Geospatially linked orthophotoplanes were first subjected to the decoding process in camera conditions. Then the field work was carried out and the decoding work was completed in camera conditions. The decoded study area was decoded in ArcGIS software

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and the location details were digitized. When entering location details, highways, field roads, irrigation and irrigation networks, hydrotechnical structures, residential areas, and land types were included in the geodatabase. At the end of the work, experts introduced changes in the recommendations of the place by the method of correction. Correction As a result, an electronic digital map of the research area was created (Fig. 5).

Figure 5. Electronic digital agricultural map of Dostlik massif, Argona district, Fergana region.

**Developed by the author*

Land contours, land users, land types and crop types were included in the created electronic digital map of agriculture. At the same time, point, area and line layers were used to create the agricultural map. The names of agricultural objects were entered into the attributive data table of the used vector layers. Based on the names of agricultural objects, a database of conditional characters was created, and the appearance of agricultural objects was geovisualized according to the requirements of the state standard on semantics. This created database of conditional symbols is being used in production organizations for geovisualization of agricultural maps of our republic. In this way, the agricultural map of the research object was created in digital form on a scale of 1:10,000 (Fig. 6).

Figure 6. Digital digital map of agriculture on a scale of 1:10,000.

**Developed by the author*

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The recommended method for creating electronic digital maps created on the basis of these orthophotoplans differs from the existing method in terms of time efficiency and economic efficiency.

According to the economic analysis, 10 specialists conducted field research for 20 days to create an agricultural map of 620 square km. soum is required. A total of 8 million for transportation costs. 10 employees were involved in digitalization of field work for 10 days. 10 specialists were paid 20 mln. for their work during 10 days. 100000 soums of funds are allocated, and at the same time, it is required to carry out field work for 10 days to correct the digitized maps by the experts who carried out field work above. A total of 10 mln. soum funds should be allocated (Table 3).

Table 3. Economic indicators for carrying out field research in decoding, correction and decoding methods (proposal)

T/r	Research method	Number of specialists, people	Required time, day	Funds for expenses, soums	Salary for employees, soum
1	Decoding and correction	10	30	30,000,000	50,000,000
2	Digitization	10	10		20,000,000
3	Transportation costs			8,000,000	
4	Electricity costs			3,000,000	
5	Total	10	40	41,000,000	70,000,000
		General		**111,000,000**	

**Developed by researcher*

As a result of the comparison of the existing method and the traditional methods, it was found that the cost and time efficiency of digitizing the land area of 620 sq. km.

Table 4. Comparative table on conducting field research in decoding, correction and decoding methods

T/r	Research method	Number of specialists, people		Required time, day		Funds for expenses, soums		Salary for employees, soum	
		Available	**Offer**	**Available**	**Offer**	**Available**	**Offer**	**Available**	**Offer**
1	Decoding and correction	10	10	36	30	30 mln	30 mln	50 mln	30 mln
2	Digitization	10	10	15	10			30 mln	
3	Transportation costs					10 mln	8 mln		8 mln
4	Electricity costs					5 million	3 mln		3 mln
5	Total	10	10	51	40	51 mln	41 mln	80 mln	41 mln
	Available					131 mln			
	Offer					111 mln			

**Developed by researcher*

According to the results of the analysis, the proposed scientific research is based on modern techniques and technologies, while the decoding and correction work is carried out using the modern " Land Surveying " mobile application, and the decoding work is carried out in the ArcGIS software. As a basis, field research was carried out using space photographs and aerial photographs.

CONCLUSIONS

In order to standardize the results of the research and expand the scope of use, a server memory cabinet was created for the mobile application " Land Surveying ". Thematic layers of electronic digital maps have been brought into a single format unit for common use in the memory server. This format unit is KMZ, which made it possible to use thematic layers not only with software belonging to the family of geoinformation systems, but also with the help of mobile applications. Authorized users, specialists and

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scientific researchers will be able to obtain relevant information and conduct analytical research from the data warehouse in this server's storage cabinet. Based on the information in this server cabinet , scientific research was conducted by an independent researcher and reliable results were obtained.

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SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 7 | Issue: 12 | December 2022 - Peer Reviewed Journal

CYBERSECURITY AND CYBER ATTACK

Rakshit Kapoor[1], Kuldeep[2], Rohan Shokeen[3]
[1]*Enrolment No 01914004421*
[2]*Enrolment No 02114004421*
[3]*Enrolment No 02314004421*

ABSTRACT
With the advancing time, the world is getting advanced and digital. And with this advancement comes the risk of attackers. This is why cyberspace needs security. The term used for this term is ***CYBERSECURITY****. With the advancing world, especially during this time of thepandemic, nearly every work is done online. The internet is filled with valuable data starting from somebody's personal information to even their bank account. The attackers try to steal these data for personal or professional gain. There are plenty of ways of attacking any system for instance the most popular and used way of attacking,* ***MALWARE****. It is software that is solely developed to damage and destroy a computer system in other words it is "malicious software". This malware is developed to tackle every known defense mechanism resulting in the desperate need for the continued improvement in the defense mechanism. This paper intends to give little understandingof the need for cybersecurity. [i]*

KEYWORDS: *Cyber security, Cyber-attacks, Security Techniques, Prevention*

I. INTRODUCTION

Our world today is greatly dependent on technology. Cyber-attacks have become pretty common and as much disastrous due to the dependence on technology. Due to the pandemic, the transition from physical to digital workbench has resulted in a dramatic increase in both criminal attacks as well as ransom attacks. According to the research, India was the most affected country in the world. All the countries across the globe are increasing the budget sanctioned to the cybersecurity sector due to the recent increase. Today, the world is getting more aware of the vulnerability that has developed due to the increase in dependence on technology. The attackers are getting more and more advanced along with the technology, we also need to step up to protect our data as much as we could. One of the main questions that arise due to the recent events is, **Why has cybercrime starting to surface?** The reason is simple. Committing cybercrime is less risky and cheaper when compared to physical attacks. The need for **CYBERSECURITY** has never been higher. [iii]World Wide web (WWW) was created in 1990s by Sir Tim Berners, after which began the demand for public access of it due to its ease of solving many problems. But with every great thingcomes the worst part of it as well, Cybercrimes. Cybercrimes have many forms like cyberbullying, Identity theft, Phising and many more. But most of it is commited by the unethical hackers for some personal or professional gains. The amount of harm that these tactics may cause is unfathomable. One can virtually assume anyone's identity and access from personal data to professional which can eventually end up affecting victim's life in a bad way. There are countless cases of cyberbullying resulting in victim developing depression as well so these attacks are far worse than physical attacks as it affects a person's mental health. [iv] Cyberattacks are getting more and more deadly with the evolving world. With passing time worldis getting bent towards the technology making the world more and more exposed towards the danger of getting attacked virtually. For example, the **TESLA** car that is capable of driving itself on its own or now-a-days a lot of house assistants are developed with smart artificial intelligence like alexa or google home. Every mobile device already has adapted some sort of AI to ease its work like apple uses SIRI and android Google. These adaptions does ease our works but also makes it vulnerable to attacks which is why the manufacturers already spend a hefty amount of their budget in order to make them as secure as possible. But still there are always some who come up with some sort of algorithm turning it into codes and eventually a software which is popular as **MALWARE**. These malwares are made with the target in mind and have the capability to harm the same. Then there comes **PHISHING,** a reputed and trusted name is used to send a malicious link of some sort via message

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EPRA International Journal of Research and Development (IJRD)
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or emails, upon clicking it makes the system vulnerable and could be used to steal sensetive data. There are also methods of hacking a website if it seems impenetrable from outside, like finding the server one is using and then attack some other website which happensto be less secure and operates on the same server and through that reaching the target gets easier. [v]

Whatever is done the attackers would always find their ways in. So, What's the answer to this dilemma? **Evolution in cybersecurity** is the only current solution and may would be only solution.

II. STUDY OF CYBERSECURITY AND CYBER ATTACKS

Cybersecurity is often mistaken as a way to protect themselves from hackers only, but this is only a part of the complete picture. Cybersecurity is not a term that indicates making one's devicecompletely impenetrable but its more like an insurance that it won't be harmed that easily. In todays world every organisations be it government or private use computer networks and the technologiesand this has resulted in the security with utmost importance. And now cybersecurity is being moreimportant with the passing time since everything be it car or metro, a house or even an entire city is becoming smart by adapting technologies to operate themselves. With the growing world, we are able to operate everything from lightbulb in our room to our vehicles with nothing but a digitalnetwork connected to our device. **What is the definition of smart city?** A city which uses everything starting from AI to colud computing and what not. In short, a smart cities are vast systems that are closely interdependent. But can we truly call any city so heavily reliant on technology a smart city? It won't be much of a smart city if it is that easy to damage. We can deducethat transitioning a city from connected to smart is complex and time-consuming as it involves a high level of reliance and connectivity across its levels, it is a security-conscious procedure. This section covers the most serious security concerns and violations that might ariseat any stage of a city's smartening.

Cyber-physical infrastructure utilised in city smartening has a number of weaknesses andhazards. Despite the widespread usage of modern cyber-physical infrastructure systems, there is no satisfactory understanding of their vulnerabilities and dangers. We'll go through the most common infrastructure security risks and problems.

- **Cameras:** Cities are littered with private and public cameras, all of which are secured in various ways by encryption and username/password security. Accessing private or publiccameras and having access to them violates people's privacy while also spying on government interests.
- **Building Management Systems:** Designers and developers of such systems typically focus on the service offered while ignoring cyber security concerns. As a result, manufacturers of such systems do not provide notification options for users to be notifiedabout security violations.
- **Eavesdropping:** Install eavesdropping tools on a network segment to monitor communication channels, record network behaviours, and generate a network map. Itcan result into a huge personal or professional loss.
- **Theft:** It has an impact on urban infrastructure by stealing both intangible items like sensitive data, information, credentials, software, and cryptographic keys, but alsogadgets and technical equipment. It compromises the availability and confidentiality of systems, resulting in financial losses and a tarnished image.
- **Denial of Services DoS:** This process is to overburden connections until services andgadgets that rely on them become unavailable. Attacks on systems or connections via denial of service (DoS) have a negative impact on their availability.
- Other dangers include device failure, software crashes, environmental and natural behaviors, and vendor and manufacturer support termination. Such attacks compromise the availability and integrity of infrastructure systems, resulting in production and servicedelivery failures.

Smart Cities deal with massive amounts of real-time data and associated data-driven technologies that act on, create, analyse, execute, and produce data. Many resources in smart cities produce many sorts of data.

III. CYBER SECURITY TECHNIQUES

1. Strong Password Security: Increasing the security of your system is made simple by usinga strong, complex password. For instance, a password with letters, numbers, and special characters It can be prevented from being cracked by brute force by routine update.
2. Authentication of knowledge: Regular updates and use with prudence are important for knowledge authentication since hackers and programmers can take advantage of email andthe web in many different ways. System updates and routine backups are fantastic ways topreserve your data, ensure that it can be retrieved, and fix any faults or flaws in the system.

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3. Malware scanners: Programs that examine all files on the device for malicious code and viruses. Malicious software is referred to as malware and includes worms, Trojan horses,and viruses as examples.
4. Firewalls are pieces of hardware or software that help identify hackers, viruses, and worms that try to access your device through the internet. Every message entering orleaving the web is examined by the firewall, which prevents any that don't meet the minimum security requirements.

IV. CASE STUDY ON CYBER ATTACKS

i. Andhra Pradesh Tax Case [iv]

In Andhra Pradesh, the owner of a plastic company was taken into custody. Twenty-two crores incash were retrieved by the Vigilance Department from his residence. They demanded information and explanation from the individual regarding the undeclared money. 6,000 vouchers were deposited by the defendant to confirm the legitimacy of the company. But it turned out that all of the vouchers were created after the raids were carried out after a careful review of the data and vouchers on his PCs. In order to present sales records and avoid paying taxes, it was discovered that five enterprises were operating in the same space as a single company. As the department authorities seized the accused's computers, the Andhra Pradesh chief businessman's interrogation techniques became apparent.

ii. The Bank NSP Case [v]

The Bank NSP case involved a bank management trainee who was both engaged and getting married. The couple utilised the business's PC and sent and received numerous emails and messages. The young lady created false email accounts with the name "Indian Bar Associations"and sent emails to the man's international clients when the two eventually split up. She completed this on the bank's computer. The man's business lost a lot of clients, and it sued the bank in court to recover those losses. The emails sent via the bank's system or PC belonged to the bank, and the bank was accountable for them.

iii. State of Tamil Nadu vs. SuhasKatti [vi]

This case is related to the publishing of an offensive, hurtful, and graphic message about a divorced woman in a Yahoo texting group. Additionally, emails were sent to the victim seeking proof by the suspect through an incorrect email account he opened in the victim's name. Due to the lady's posting of the message, she received bothersome calls from people who mistakenly thought she was soliciting. In response to a report the victim filed in February 2004, the police tracked the suspect down to Mumbai and apprehended him within a short period of time. The offender was apparently interested in marrying the victim since he was a well-known family friend of hers. She married someone else, though. The accused began contacting her again after this marriage ended in divorce. The accused began harassing her online because to her hesitationto marry him. Twelve witnesses were questioned by the prosecution, and complete papers were designated as exhibits. The court determined that the offence was conclusively proven and foundthe accused guilty based on the expert witnesses and other evidence presented to it, including witnesses for the owners of the Cyber Cafe. This is thought to be the first instance in Tamil Naduwhere the criminal was found guilty under section 67 of the Indian IT Act.

iv. Online Credit Card Fraud on e-Bay [vii]

Police in Rourkela break a scam that included a $12.5 million online fraud. The accused's "modus operandi" was to hack into the eBay India website and make purchases using other people's credit cards. Two people—including the BCA student suspected of being the plot's mastermind, Debasis Pandit— were apprehended and brought before the Rourkela court of the subdistrict judicial magistrate. Rabi Narayan Sahu is the other person who has been taken prisoner. Under Sections 420 and 34 of the Indian Penal Code and Section 66 of the IT Act, a case has been filed against the accused. Approximately 700 credit cardholders' personal information was allegedly collected by DebasisPandit after hacking into the eBay India website.At that time, he used their passwords to make purchases. When it was discovered that just a small number of purchases were made from Rourkela while the clients were located in locationslike Bangalore, Baroda, Jaipur, and even London, the fraud was brought to the attention of eBayofficials. After some customers complained, the business brought the problem to Rourkela police's attention.

V. CYBER ETHICS AND PRACTICES FOR PREVENTION OF CYBER ATTACK

1. Do communicate and engage with others online. Keeping in touch with family, friends, and coworkers is made easier through email and texting. sharing fresh ideas, knowledge, and understanding with others locally or globally.

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2. Never exchange or transfer personal information over an unencrypted network, including unencrypted mail, such as your bank account number, password, ATM pin, and so forth.
3. Never join up for a social networking site or platform until you are sure that it is legitimate andreal.
4. Never neglect to update and renew the operating system. One should install and regularlyupdate software like firewalls, anti-virus, and anti-spyware programmes on their PCs.
5. Never go to, follow, or respond to a spam website or link.
6. Avoid being a bully or a harasser online. Avoid using insulting words or phrases. Don't insult individuals, call them names, send them obscene or embarrassing photographs, or try to injurethem.
7. The internet is regarded as the world's largest library, offering data on every subject and field of study. Therefore, use this information ethically and legally.
8. Never divulge your password to anyone, and never use someone else's password to accessyour account.
9. Never give out your personal information to anyone since there is a chance that someone elsewill misuse it and you will be held responsible.

CONCLUSION

So atleast in every organisations be it government or private or even NGOs that uses computer network must give their employees atleast the basic knowledge of cybersecurity to prevent any tragedy from happening. Cyber security in smart cities is a critical problem that requires consideration of a number of security risks related to technology, applications, infrastructure, and data. The growing integration of technologies, as well as the resulting intensive communication, high complexity, and high interdependency, has a significant impact on cyber security, resulting in an unbounded attack surface and cryptography-related difficulties. Smart city cyber security is a critical issue that necessitates worldwide collaboration with specialists from all around the world. India, a nation of 1.3 billion, has the lowest data rates worldwide. The advancement of the network has increased the importance of data and information security. This study makes it quiteevident that as cyberspace and technology advance, so will the range of cyberthreats. To protect data, one must take precautions such as installing antivirus software, employing firewalls, creating strong passwords, and practising hacker avoidance. India needs to switch from its current reactive strategy of merely protecting its cyber system when cyber security incidents occur to a proactive one. Because it is very necessary. To sustain the rule of law, awareness campaigns, firm modifications, criminal laws, and cyber security regulations are required to defend rights and privacy.

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EPRA International Journal of Research and Development (IJRD)
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CHALLENGES OF USING DRONES FOR HEALTHCARE DURING FLOOD

Jomol John
International Centre of Technological Innovations

ABSTRACT
An unmanned aerial vehicle, commonly known as a drone, is an aerial vehicle without a pilot, crew, or passengers. The application of drones has expanded to agriculture, patrolling, emergency response, infrastructure inspection, etc. Its application has expanded to Healthcare and Disaster management. This paper investigates the challenges of drones for healthcare during floods in Kuttanad.
KEYWORDS: *Drone, Telemedicine, Flood, Kuttanad*

INTRODUCTION

An unmanned aerial vehicle or drone is an aircraft, and it operates without a pilot. UAVs are now performing a much greater role in many areas such as agriculture, military operations, Delivery, wildlife conservation, disasters, and so on. Healthcare applications are the important application of drones Telemedicine is one of the important applications of drones. It can supply medicine and other devices, and transport blood, organs, etc.

Kuttand, a taluk in Kerala. It is the lowest altitude in India. This region lies about 4 to 10 feet below sea level. (Suchitra, M 2003) Most of the area in Kuttanad is covered with water. Flooding is a recurring issue in Kuttanad during the monsoon season because of the area's four main rivers, the Pampa, the Achankovil, the Meenachil, and the Manimala. People in Kuttanad struggle during floods. People may even lose their lives due to a lack of better treatment.

In many areas, people implemented telemedicine during disasters. Telemedicine is a good choice to communicate with doctors and patients during a disaster and get medications Apart from these there are some challenges while using a drone for healthcare during a disaster. This paper focuses on the drawbacks of using a Healthcare drone in Kuttanad during a flood.

CURRENT TRENDS IN APPLICATIONS OF DRONES IN HEALTHCARE

eHealth(2022) MGM healthcare and drone company in Chennai has introduced a drone that can transport organs within the city. This drone can fly about 15km-20km at 300ft. This will help to deliver organs on time without affecting any traffic. (2022) Aihik.S (2022) Aster healthcare and Skye Air Mobility have conducted trials of delivering medicines from Kozhikode to Malappuram districts. Skye Air mobility planning to undertake around 50 flights that can carry blood samples and medicines. Their specialist will keep medicines and other samples in a temperature-controlled payload box.

LITERATURE REVIEW

P. L. Nedelea, T.O. Popa, and Catalin,(2022), this paper studied the possibilities of Drones and they developed drones that can carry medical devices and supply emergency aids.

Anna.M, Christopher.J Evan Arnold, Wayne.D, and Jessica K (2021) this paper describes the application of drone technology and its challenges and future scopes. drones have been able to bring such emergency medical care and relief to people during the 2010 and 2016 earthquakes.

Amritanand.S, Sruthy.A, Amritesh.A (2020) this paper investigates the challenges during emergency response. One of the main challenges that they described was the Lack of power and network connectivity during the flood people were stuck in their houses for many days without electricity and network connection.

Sooryalekshmi.S (2019) This paper studied the impact of floods in Kerala. According to the National Centre for Earth Science Studies, more than 50% of Alappuzha is categorized as a flood-prone area. Most of the areas in Alappuzha district experienced flooding as a result of the South West Monsoon, particularly in Kuttanad Taluk, where numerous roads, bunds, etc. were damaged and transportation was prohibited. The worst-affected locations in the Alappuzha district were the Chengannur and Kuttanad Taluks, where hundreds of people became stranded in flood waters that quickly reached densely populated neighborhoods. Due to heavy monsoon rains and high tides in the sea, Kuttanad Taluk began to flood

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HEALTHCARE NEEDS OF A DISPLACED POPULATION DURING THE DISASTER.

A better healthcare system is essential during a disaster. Many people are suffering from numerous diseases. And there will be more chances to spread contagious diseases if they are in a refugee camp. Some people are facing a lack of medicines. Medical camps are established in refugee camps. But another challenge is the lack of proper medicine.

HEALTHCARE IN KUTTANAD – A PERSPECTIVE OF A NATIVE.

A paddy farmer in Vezhapra village of Kuttanad was interviewed in November 2022. This farmer is a survivor of the 2018 flood in Kerala which, seriously impacted people in Kuttanad. The following conclusions have been drawn based on the interview.

Kuttanad is a low-lying area so the area remains submerged for months. Even though, during the flood Kuttanad people suffered from contagious diseases and lack of proper medication and treatment. Many people lost their lives only because of these reasons. If the health department or any other volunteers supply medicine and Kuttanad people can consult a doctor during a flood through drone-telemedicine technology. it will make Kuttanad people's life better. During heavy rainfall and flood, electricity connections will be disrupted as well as mobile network connections.

Table-1

Using google maps, the distance of all the hospitals located near the Vezhapra village was identified. Most of the hospitals are situated more than ten kilometers away from the location.

Hospitals	The district from the village Vezhapra
Mahajubilee Memorial Hospital	10.0 km
Tiruvalla Medical Mission hospital	18.7 km
General Hospital	12.9 km
Believer's Church Medical College Hospital	19.4 km
St. Jude Hospital	14.7 km
St. Gregorious Medical Mission Multi-Speciality Hospital	23.9 km
T.D. Medical College Hospital, Vandanam	28.2 Km

Can drones be used in Kuttanad for healthcare?

The Perspective of a Doctor

A doctor was interviewed in November 2022. The following conclusions have been drawn based on the interview.

Telemedicine is widely used in the context of disasters such as natural calamities and pandemics. During the pandemic, people are restricted from health consultations and treatments to reduce the number of outpatients in hospitals. So, most of healthcare facilities used this technology widely. In Kuttanad unpredictable climate change and catastrophes are common. The local administration usually considered health emergencies. Apart from it, there are high prevalence of non-communicable diseases and mental deprivation in the society. In most cases, they would not get enough care, treatment, and medicines. Telemedicine is very effective in those cases that also face a shortage of healthcare workers and facilities. However, it has several disadvantages.

- There is a high probability of clinical errors due to the lack of improper interaction and physical examination.
- Management of orthopedic and such clinical emergencies is limited with the virtual treatment methods.
-Any technical problems or regulation inconvenience occurring amidst treatment could affect the treatment.

The Perspective of a Drone Engineer.

An aerospace graduate was interviewed in November 2022. The following conclusions have been drawn based on the interview.

Drone in the field of telemedicine is something uncommon. This is because the use of drones during harsh weather conditions is unsuitable. Drones have been used in many sectors of the country to improve lifestyle. During the flood of Kerala, it was seen that a large group of people needed medicines. They were either stuck or at places where they cannot be reached either by foot or road. In situations like this air, transportation was used. There are a lot of parameters to be followed, which include the temperature of storage when using drones for storage and transport of medicine, and the efficiency of these medicines gets compromised. Drones have been used in many different areas of telemedicine such as blood and rescue medicine transportation. But there are many challenges for this; for instance, stability of flight, weight, flight time, flight range, and emergency landing procedures. Another major drawback during calamities such as floods is that during heavy rain operating a drone is not feasible.

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CONCLUSION AND DISCUSSION

In this study, the challenges identified for using a drone for healthcare during floods are – electric power failure, network connectivity issues, bad weather conditions, and flight range

- lack of electrical power and network connection will disrupt the communication between patient and doctor.
- During heavy rainfall and wind, it will be riskier to fly a drone due to atmospheric turbulence.
- It is necessary to develop a drone that can fly in any weather condition.
- It is important to develop an efficient drone that can fly long distances and operate under any conditions.

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EPRA International Journal of Research and Development (IJRD)
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CHALLENGES AND SOLUTIONS IN TEACHING ENGLISH TO YOUNG LEARNERS

Otaboyeva Hurshida Saidali kizi
An English Teacher of NamSU

ABSTARCT
This article focuses on the challenges faced by teachers of English to young learners against the backdrop of the global rise of English. A number of challenges emerged as affecting large numbers of teachers in different educational contexts, namely, teaching speaking, motivation, differentiating learning, teaching large classes, discipline, teaching writing, and teaching grammar. Teaching a language has many different features. Furthermore, teachers have to understand what students learn, how and why such learning influences them, how lessons could be beneficial for them in the future. Hence, language teaching requires teachers to teach students to develop both academic and personal abilities.

KEYWORDS: *game, to communicate, learning , method, situation, teaching, primary, ability, development, teaching, motivation, challenges, problems, methods, suggests*

1. INTRODUCTION

Currently, there is a huge interest in the early development of children. Like many other subjects taught in school, the subject of the English language is one of the most relevant and demanded. The relevance of learning English is dictated by the needs of the modern world. Nowadays, the English language has become an international language of communication. The President of our country Shavkat Mirziyoyev pays special attention to this sphere, which has an important place in ensuring the future of the country and its development. This is not surprising, since the formation of the child's personality takes place in primary school, the identification and development of his abilities, the formation of the ability and desire to learn, the mastery of elements of the culture of speech and behavior [1, p. 154]. As expressed by Brown “learning a second language is a long and complex undertaking” that includes different variables such as learner, learning atmosphere, learning materials, environmental factors, and teachers.[2,p.1] Cameron suggests that starting to learn foreign language at the earlier age results benefits to some areas of language skills, i.e. listening comprehension and pronunciation.[3.] The task of the teacher is to choose such teaching methods that would allow each student to show their individuality, activity, creativity, but teaching a foreign language in elementary school meets many difficulties on its way. When teaching English, we, foreign language teachers, face a number of problems. Students’ challenges namely cognitive development, lack of motivation, discipline problems, speaking problems, and writing. Nunan explains that cognitive development, motivation, attention, multi-level groups, and assessment are the challenges in TEYL.[4, p.7-12].

2. LITERATURE REVIEW AND METHODOLOGY

The first problem in teaching younger schoolchildren a foreign language was motivation and understanding what a foreign language is needed for in later life. Students' lack of motivation may be caused by a lack of support from their parents. The following problem follows from it — this is inattention and restlessness in the classroom. Memory Songbatumis spoke in detail about her experience when she once caught a student who did not bring any books to school due to forgetfulness. In contrast, other students intentionally left their books on the classroom table. Memory Songbatumis believes that such things would not have happened if the parents of students controlled the education of their children at home [5, p. 65]. The students will be highly motivated once they know what they are expected to be able to do after learning certain materials as well as the things they could relate to the material are. According to L. A.Tsyban, primary school students are inattentive due to their period of development, so children are distracted, cannot concentrate on the educational material and stop listening to the teacher[6,p.507] At the same time, new, unexpected and vivid material is remembered faster and easier. Many teachers take advantage of this and use more visual material in their work. At the same time, it can be beautiful, colorful and interesting, and students may miss significant and serious details of the submitted material.

The next problem- Shyness. The first obstacle to learning a foreign language is shyness. Students who are just starting to learn a foreign language will be afraid: "I won't be able to speak this language correctly, I won't be able to learn this language."

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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For this reason, students develop insecurity and shyness. For example, there may be some shy students who, despite completing homework, do not feel comfortable talking to their classmates.

3. DISCUSSION

One of the main obstacles to learning English is the lack of time. No matter how well organized and effective the lesson is, if the student does not apply what he has learned in practice, he will quickly forget what he learned during the lesson. Therefore, it is right to have enough time to develop the student's English language skills. According to A. O. Pirozhkova, younger schoolchildren perceive symbolic and schematic images worse, and visual material is better[7,pp. 199–207]. Many trainers in the field of education know that in the process of learning, children need a frequent change of events and activities, otherwise they get tired pretty quickly. Based on my experience, the best way to solve this problem is first to find out their own needs and weaknesses. Gaming technologies help teachers switch their attention and senses during the lesson. The concept of "game pedagogical technologies" includes a group of methods and techniques for organizing the pedagogical process in the form of various pedagogical games. In particular, L.S. Vygotsky believes that the game is a space of "internal socialization" of the child, a means of assimilation of social attitudes. In this regard, a new problem appears — the effective introduction of gaming activities into the educational process[8,p.480]. Many teachers note the following problems when introducing gaming technologies in foreign language lessons:

-distraction from the educational material (concentration on the conditions of the game, not on the content);
-uneven inclusion in the game (some children do not want to play, others get involved in the process late, others do not associate entertaining forms of activity with the lesson);
-maintaining discipline in the lesson (explaining the rules of the game takes a lot of time from the lesson);
-games take a lot of time;

In developing games - this is their main feature - it was possible ***unite*** one of the basic principles of education ***from simple to complex*** *from* very important principle of creative activity ***independently according to ability,*** when the child can rise ***to the "ceiling"*** their possibilities. This union allowed us to solve several developmental problems in the game at once. Despite the description of modern problems, many teachers note that during the junior school period, students show a vivid interest in foreign languages, they have a need to express their thoughts in a different way, a desire to play "foreigners", which, in turn, gives a motivational charge in studying this school subject. By the 3rd grade, students become more diligent and able to withstand 45-minute classes. By this age, there is a desire to feel like a person, as well as a need for praise for every small, but successful step. In this regard, students are more diligent and do not get distracted by game moments, but focus on the content of the material. A teacher who has mastered the methods of teaching the language perfectly, despite the difficulties, easily overcomes obstacles.

The next challenge is to gain the students' attention. Getting the students attention is the first thing that the teachers should be able to do as children's attention period is limited. Sustaining the learners' attention during the instruction is very important that they are learning in order to perform it. In this case, teachers have to vary the activities in order to maintain the students' attention. Thus, including a variety of learning style into the activities are likely to be a wise decision.

4. RESULT

Currently, English language teachers use the world's best practices, new technologies and methods in language teaching to improve the quality of teaching English . Educational games can give "writing" for the development of creative abilities with *earliest* age;

Their task-steps always create conditions, *leading* ability development;

Rising up every time *independently to its "ceiling"*, the child develops most successfully;

Educational games can be very *varied in content* and besides, like any games, they do not tolerate *coercion* and create an atmosphere *free* and joyful creativity.

5. CONCLUSION

In conclusion, I would like to note that these problems arise for every foreign language teacher to a greater or lesser extent. There are many difficulties in learning English, which has become a world language. Nevertheless, any teacher who finds the key to these problems thinks about the best ways to learn a foreign language and can eliminate any obstacles using effective, advanced technologies. Liton, a scientist from Europe, noted in his research that both teachers and students face problems in mastering English. Teaching a foreign language at school requires a high level of professional skill, love for children, as well as efforts and ability to present the material so that students successfully assimilate it and show interest in the subject. This, of course, can be achieved with some effort, and, as practice shows, success depends not so much on experience as on the enthusiasm, energy and interest of the teacher. In addition, the use of ICT in teaching foreign languages plays an important role. Shyness of the student, lack of time, textbooks with difficult tasks, etc. – it was found that such problems have a negative impact on the level of mastery

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of the English language of the student. In general, in order to overcome the obstacles that students face when teaching them English, the teacher must constantly improve their professional skills.

In addition, it should be noted that the content of the textbook tasks and the form of their presentation help students develop speaking skills, overcome fear of speech and learn about different aspects of their "I". For example, the context of practical work on the topic "Family Tree" for the 3rd grade students provides an opportunity to individually analyze their lineage with the use of research and partial search methods by creating a genealogical scheme going as deep as the third or fourth generation.

Moreover, as we have seen, it is the teacher who must overcome the negative habits inherent in any student when learning a language. In solving these problems, it was found that barriers are eliminated only when language teaching methods gain the interest of students, when using effective new technologies in language teaching. And the main task of the teacher is communication, which opens the way for students to interact, giving them creative freedom. Other solutions are also proposed such as learning from/consulting with teacher advisors, using teaching aids/medias, using gestures/mimes, etc. Involve students in the lessons as much as possible! Talk to all of the students and use their names when talking to them. Give them a physical task and change the pace of the lesson to get their attention back. You could ask them to show you something that's in the room where they are - ask them to tell you about it. Tell them to hold up something of a certain colour or to 'clap if…'. This is a good way to involve students without them having to talk, to check their understanding of something or to share their answers to a task. As well as helping to keep students' attention, it's also a break away from focusing on something which is on screen. Another way of ensuring students are talking more and you less, is to demonstrate an activity but then encourage students to lead the activity. The results of this article will be of great help to English teachers in all secondary schools.

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EPRA International Journal of Research and Development (IJRD)
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FROM THE HISTORY OF PUSHKINIA OF UZBEKISTAN

Rasulova M.Kh.,
KSPI,
Republic of Uzbekistan

ANNOTATION
The article discusses the history of Pushkiniana in Uzbekistan, studies its origins and traces the stages of its formation.
KEYWORDS: *Pushkiniana, cultural ties, historical homeland, folk reading circles, Pushkin Society, Pushkin Chest*

The history of Pushkiniana in Uzbekistan begins at the end of the 19th century with events in the Turkestan region dedicated to the 100th anniversary of the birth of the great Russian poet. In particular, in commemoration of this year in Tashkent, the former Lagernaya Street, at the request of the townspeople, was renamed Pushkinskaya Street. Russian settlers who came to Central Asia for various reasons sought to maintain and develop their spiritual and cultural ties with their ethnic homeland.

There were few books in the Turkestan region, so at the end of the 19th century in Tashkent, educational "folk reading circles" organized public readings of works of art for the townspeople. In 1901, the "Committee for the Encouragement of Public Reading and Public Education in the Turkestan Territory", later known as the "Pushkin Society", was formed.

On Sundays there were public readings, mostly of Russian classics. In the period 1902-1905. in the Turkestan region, 143 public hearings were held, at which the works of A.S. Pushkin, N.V. Gogol, L.N. Tolstoy and other writers. A bookstore "Pushkin's Lary" was opened in the central bazaar, where books were sold at low prices.

Some of Pushkin's works in the Turkestan region got acquainted mainly during training in educational institutions. Directions were outlined, which were further developed in the pedagogical practice of schools in Uzbekistan. It has become traditional to study Pushkin's works in gymnasiums and schools with Russian as the language of instruction, in which the program for studying Russian literature met the requirements of the Russian school.

In pre-revolutionary gymnasiums and schools, KD Ushinsky's textbooks "Native Word", "Children's World" and "Anthology" were used. From the richest Pushkin's heritage, the "Native Word" included 15 poems and excerpts from poems, such as "Echo", "Gold and Bulat", the prologue to "Ruslan and Lyudmila", "The Tale of the Fisherman and the Fish", poems about nature. The "Chrestomathy" published the "Chronicler" ("Another last tale ..."), "The first news of the impostor" (Boris Godunov's dialogue with Tsarevich Fedor and Shuisky's story about the appearance of False Dmitry), "The Song of the Prophetic Oleg", "Caucasus" , an introduction to The Bronze Horseman, a description of the battle from the poem Poltava.

Methodist S.M. Gramenetsky prepared and published several textbooks, according to which for many years they studied the Russian language in pre-revolutionary Russian-native schools. In the "First Book for Reading" only one Pushkin's poem was published under the conditional title "In Winter" ("Here is a boy running in the snow ..."). In the "Second Reading Book" the poems "Winter Road" and "Horse" ("What are you laughing, my zealous horse ...") were printed. The "Third Book for Reading" included "The Tale of the Fisherman and the Fish", "Foundation of Petersburg" ("On the Shore of Desert Waves ..."), "Spring" ("Driven by Spring Rays ..."), "The Coming of Spring" ("Already the snow is melting ..."), "Autumn and Winter" ("Already the sky was breathing in autumn ..."), "Winter Evening", "Winter Morning" ("Evening, do you remember, the blizzard was angry ..."), "Anchar".

More than a century has passed since the Uzbek reader first got acquainted with the works of A.S. Pushkin in their native language. On March 14, 1899, in connection with the 100th anniversary of the birth of the poet, a prose translation of Pushkin's Tale of the Fisherman and the Fish was published in Turkiston Viloyatning Gazette. In the same newspaper, prose translations of Pushkin's poems "The Poet" and "To the Poet" were given, combined into one work. It was a retelling of the content of Pushkin's poems, close to the original source, without taking into account the poetic features of Russian verse.

The Uzbek educators tried to include the fairy tales of A. Pushkin and the stories of L. Tolstoy into the programs of the new-method Uzbek schools.

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This tradition of familiarizing students of non-Russian schools with the basics of Russian artistic culture through the study of the poetic works of A.S. Pushkin was further developed in the pedagogical practice of subsequent years.

In modern Uzbekistan, a positive attitude towards the poetry of A.S. Pushkin has been preserved, and the study of his creative heritage is included in the compulsory school curriculum in literature.

In modern schools with the Uzbek language of instruction, the poetry of A.S. Pushkin helps students to "discover" Russia, which is far away for them, to feel the peculiarities of its nature and climate, to get acquainted with Russian life, rituals and customs that differ from local, national ones.

Textbooks on the Russian language for schools with the Uzbek language of instruction, published in sovereign Uzbekistan, mainly feature landscape lyrics by A.S. Pushkin. The biography and work of A.S. Pushkin in schools with the Uzbek language of instruction is studied in the course "Literature". Pupils read the recommended Pushkin works in their native language.

The poems and poems of A.S. Pushkin began to be studied in educational institutions in which the teaching of academic subjects was conducted in the native Uzbek, Karakalpak or other language. In the 60s, a two-volume edition of "Selected Works of A.S. Pushkin" was published in the Uzbek language, which included new translations of the works of the Russian classic. Among the translators were well-known writers and poets of the republic Mirtemir, Zulfiya, Askad Mukhtar, Mirmukhsin, Ramz Babadzhan, Hamid Gulyam, Erkin Vakhidov, Abdulla Aripov, Jamal Kamal, Suleiman Rahman, Abdulla Sher and others.

In 1999, the Publishing House of Literature and Art named after Gafur Gulyam prepared and published a jubilee one-volume "Selected Works of A.S. Pushkin", compiled by the People's Poet of the Republic Abdulla Aripov.

The work of A.S. Pushkin attracted the attention of Uzbek researchers when studying the history of modern Uzbek literature, when describing the mutual influence and mutual enrichment of Russian and Uzbek literature, when revealing the theme of the East in the works of the Russian poet. Gradually, the transition from newspaper publications about the work of A.S. Pushkin characteristic of the pre-war Pushkinian of Uzbekistan, to serious scientific generalizations and research.

In the article by Izzat Sultan "Pushkin and Uzbek Literature" (1949), the work of Uzbek philologists in studying the poet's work in the republic was analyzed for the first time. "Pushkin's direct influence on the formation of Uzbek literature goes in two ways," the Uzbek critic concluded, "through the study by our writers of the positive aspects of the realistic method of the "natural school", the founder of which in Russian literature is Pushkin. The second way is the study of our writers from Pushkin with his rich poetic and literary techniques ...".

The 70-80s of the last century became a peculiar peak of public interest in A.S. Pushkin in Uzbekistan. In 1974, the 175th anniversary of the birth of A.S. Pushkin was widely celebrated in Uzbekistan. By the anniversary date in Tashkent on June 6, 1974, a monument to the great Russian poet was opened by the Russian sculptor M.K. Mirtemir, Mirmukhsin, H. Gulom, V. Zakhidov, E. Vakhidov, G. Salomova, O. Sharafutdinov, Zh. "Pushkin translated into Uzbek".

In 1977, a Decree on the "Traditional Pushkin Readings" was adopted in Uzbekistan, which began to be held annually on the second Sunday of June. The first Pushkin Readings took place on June 6, 1977. The readings opened with a meeting of prominent Uzbek poets and guests of the capital on Pushkin Square with numerous admirers of Pushkin's poetry. Folk poets Zulfiya and Mirtemir, poets Ramz Babajan, Lev Oshanin, Erkin Vakhidov, Evgeny Antoshkin and others read poems by Pushkin and Navoi in Russian and Uzbek

Since 1974, special Pushkin scientific sessions began to be held regularly at the Pushkin Institute of Language and Literature of the Academy of Sciences of Uzbekistan.

The people of Uzbekistan showed their love for the poet not only in the mass publication of his works in the Uzbek language, but also in naming villages, collective farms, schools, libraries, institutes, streets and squares after Pushkin. At the end of the 20th century, the name of A.S. Pushkin survived and remained in the names of streets, squares, metro stations of the capital, city schools, libraries. The monument to A.S. Pushkin on the square named after him attracts attention as a symbol of the long-term connection between Russian and Uzbek cultures and literatures.

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SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 7 | Issue: 12 | December 2022 - Peer Reviewed Journal

PHRASEOLOGICAL ANTONYMY IN THE RUSSIAN LANGUAGE

Rasulov I.I.
Kokand State Pedagogical Institute,The Republic of Uzbekistan

RESUME
The article deals with the peculiarities of the component structure of antonymic phraseological units, the basis of which is often lexical antonymy.
KEY WORDS: *phraseological units-antonyms, lexical antonymy, paradigmatics, compatibility principle, synonymic-antonymic paradigms, structure of phraseological semantics*

The structure of a phraseological unit, depending on the use of lexical antonyms, obeys the laws of paradigmatics [1, 505]. Often antonymous meaning to phraseological units is given by antonyms that are in their composition: look from top to bottom - look from bottom to top; sleeveless - rolled up sleeves; come to a dead end - get out of a dead end; put on a mask - take off the mask; white bone - black bone, etc.

Lexical antonymy often becomes the basis of phraseological antonymy in Russian. For example: cold blood - hot blood, good genius - evil genius, strong side - weak side, get smart - get out of your mind, anchor - weigh anchor, gain strength - lose strength, lose your temper - pull yourself together , time does not wait - time endures [2, 237].

Such a structure of phraseological units in the Russian language corresponds to such paradigmatic properties of commonly used antonyms as the symmetry of meaning, stylistic and emotional, the similarity of lexical compatibility and the presence of contextual relations [3, 7].

Antonymic words as part of phraseological units, as well as lexical units with opposite meanings, retain the principle of compatibility with the same word. The lexical composition of phraseological units may coincide with traditional free phrases. This phenomenon is typical for phraseology, since one pair of antonyms can be the basis for the antonymy of several pairs of phraseological units: get into a rut - get out of a rut, gain your mind - lose your mind, turn your back - turn your face, put you in a dead end - get out of a dead end and etc.

Opposite components of phraseological units are sometimes subjected to a synonymic replacement, then the synonymic-antonymic paradigms of words come into play [4, 24]. Here are examples: to stand on the (bad) bad path - to stand on the right (good) path, a stuffed (tight, thick, full) pocket - an empty (skinny, thin) pocket, etc.

The opposite components of phraseological units are similar to free phrases and their paradigms, which determine the meaning of the components of phraseological units using opposition and the structure of phraseological semantics.

A comparative study of phraseological units and words similar in lexical meanings can be used to distinguish phraseological units by the degree of semantic integrity, since it corresponds to the number of oppositions of the associative plan that are preserved in the constituent parts of the phraseological unit.

Such an analysis of phraseological units, taking into account the lexical meanings of words, will help determine the structure of the meaning of a phraseological unit. When comparing phraseological antonyms with words similar in meaning to them, one can see that antonymic features in the meaning of phraseological units are explained by the antonymy of the semantics of lexical units. For example, the distinguishing features in the semantics of antonymous phraseological units strong side - weak side, full pocket - empty pocket are identical to those that stand out in similar verbs - metaphors.

When opposing phraseological units, words are also opposed, that is, in this case, we can talk about relations of symmetrical motivation. At the same time, each of the opposed phraseological units corresponds to the meaning of the motivating basis. It should be noted that phraseological units include the figurative meaning of words almost unchanged: rolled up sleeves - sleeveless, cold blood - hot blood, etc. In some cases, the meanings of antonyms vary equally: it doesn't come out of the head - it doesn't come out of the head; trample in the mud - trample in the mud; get a hat - get a hat.

With a different meaning for antonym words in a phraseological unit, an assimilation of the meaning of opposite

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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words can occur. In antonymous phraseological units, sometimes thematically close words are used: no end - a small fraction, for a sweet soul - reluctantly, you can't see a single light - as bright as day, in the blink of an eye - in an hour a teaspoon, plug your throat - pull your tongue, you won't take it in your mouth, you will swallow your tongue, etc. As a result of such a lexical composition, common features of the meanings of phraseological units are revealed, which can be the basis for opposing phraseological units.

The similarity of the lexical composition of phraseological units that are close in meaning indicates the importance of thematically related parts of different phraseological units. Such related words-components can act as semantically supporting words for phraseological units [5, 212]. They are associatively close to the symbolic meanings of close-sounding words and their characteristic types of meaning transfer. Such constancy in the use of the same type of transfer of meaning in a whole group of thematically related words also determines the correspondence in the structure of phraseological units.

But the lexical opposition of the majority of antonyms does not always play any role in the emergence of opposition in phraseological units. Therefore, thematic links between parts of phraseological units with opposite meanings cannot be sufficient to be the basis for determining their decomposability or indecomposability into semantic elements. Usually, a comparative analysis of the words that make up a phraseological unit with the meaning of a similar lexeme, as well as comparison with other phraseological units, is required.

But at the same time, antonymous phraseological units that use the words of one thematic group: lift up to heaven - trample into the mud, a money bag - not a penny for a soul, a beaten hour - a matter of minutes, a jack of all trades - a master breaker, a tongue without bones - as if swallowed the language, etc., differ from antonymous phraseological units with a lexical composition characteristic only of them, such as: the devil in the middle of nowhere is within easy reach, the Kolomna verst is two inches from the pot, manna from heaven is like a dead poultice with its strict organization and imagery, which is motivated by figurative the meanings of words.

Thus, a comparative analysis of the words that make up a phraseological unit with the meaning of a similar lexeme, as well as comparison with other phraseological units, helps to determine the motivation of the meanings of phraseological units of the Russian language. Based on lexical antonymy, one can study the interaction of phraseological units with words, the role of lexical antonymy in the emergence of phraseological antonymy.

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SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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A REVIEW ON NANO/MICROPARTICLES FORMULATION OF VACCINE DELIVERY FOR UNIVERSAL INFLUENZA

Vivek Patel, Dr. Kantilal Narkhede, Dr. Anuradha Prajapati, Dr. Sachin Narkhede

Article DOI: https://doi.org/10.36713/epra11997
DOI No: 10.36713/epra11997

ABSTRACT

Worldwide, influenza affects millions of individuals and has the potential to cause serious illness or even death. The most effective approach of prophylaxis is vaccination, but due to strain and viral mutation changes, the seasonal influenza vaccine frequently has limited efficiency and needs to be administered annually. Although they have been employed clinically, more conserved universal influenza antigens like the M2 ectodomain (M2e) and the hemagglutinin stalk region (HA stalk) frequently have poor antigenicity. Universal antigens have been created employing nano/microparticles as influenza vaccine carriers to boost their antigenicity. Indicators of immunity and protection against influenza have been demonstrated in mouse, pig, ferret, and chicken models using polymers, liposomes, metal, and protein-based particles. This review focuses on the physiochemical characteristics, production, characterization, and biologic responses in vivo of the formulations of the seasonal and universal influenza vaccines made from these materials. The assessment concludes with future perspectives for nano/microparticles as carrier systems and other factors to take into account within the perspective of the landscape for the administration of the universal influenza vaccine.

KEYWORDS: *Influenza; Polymeric Nanoparticles; Liposomes; Gold Nanoparticles; Protein Nanoparticles*

INTRODUCTION

The World Health Organization (WHO) estimates that influenza causes up to 5 million serious cases and 500,000 fatalities annually. The entire annual economic cost of influenza in the USA alone is $87.1 billion, which includes hospital admissions, outpatient care, lost wages, and fatalities as a result of this pandemic (1). Elderly people, children, pregnant women, and those living in low-income nations are some of those who are most susceptible to contracting severe and fatal influenza infections (2). The use of NPs as a vaccine carrier system can shield vaccine components from early protease degradation, increase stability, induce sustained release, and help with targeted delivery of an immunogen to antigen-presenting cells (APCs). Due to these characteristics, nanoparticles can frequently serve as a vaccination adjuvant (3,4)

INFLUENZA

Flu (influenza) is a highly contagious illness that enters through the respiratory system and causes illness. The influenza viruses can infect both people and animals and have a negative-sense RNA (ssRNA) genome. Influenza complications can result in severe morbidity and mortality. According to recent data from the Center for Disease Control and Prevention (CDC), between 2010 and 2020, there are expected to be 41 million illnesses, 140,000 to 710,000 hospitalizations, and 12,000 to 52,000 fatalities (5,6).

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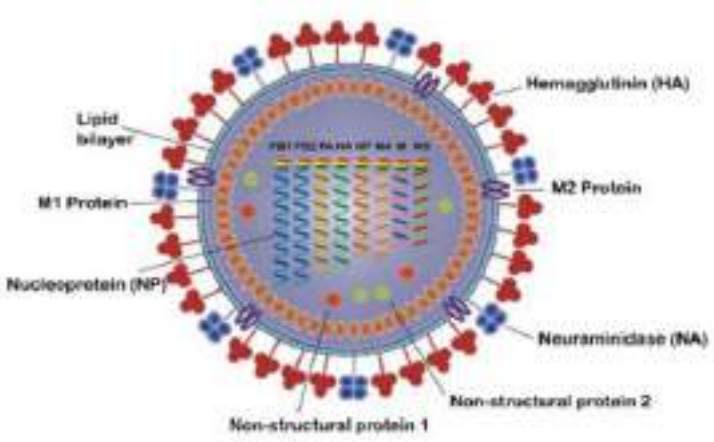
STRUCTURE OF INFLUENZA



The shape of influenza viruses can be filamentous or spherical. Hemagglutinin (HA) and neuraminidase (NA), two surface lipid membrane glycosylated proteins, are present in the influenza virus. Depending on the antigenicity, various influenza varieties may have a variable number of protein units (7, 8). The nonstructural protein 2 (NS 2), RNA segments coated with nucleoprotein (NP), and lipid envelope membrane proteins are all present in the influenza virus. Based on the surface HA and NA glycoproteins, influenza viruses are classified; there have been reported to be 18 HA subtypes and 11 NA subtypes (9).

TYPES OF INFLUENZA

They have so far identified 4 different influenza virus subtypes (A, B, C, and D) based on changes in the antigens that are present on nucleoprotein and matrix proteins. There are various subtypes of influenza based on the influenza genome. influenza strains of 8 types (A, B) or 7 types (C, D). Out of all of these strains, Type A strain is the one that consistently causes serious respiratory infections that can be fatal. A new influenza pandemic or outbreak is a potential. According to reports, humans can become infected with the influenza B strain. Because B/Victoria and B/Yamagata are influenza B lineages that circulate each year and cause seasonal flu infections, they are employed in the creation of vaccines. Typically, mild symptoms are brought on by influenza C viruses. Small farm animals such as sheep, pigs, and cattle can contract influenza D. On how it infects humans, there is limited data (10,11).

INFLUENZA VACCINE

The use of vaccinations to prevent infections like the flu and other viruses is an effective and cost-effective method of limiting epidemics. Antigenic drift or shift causes annual influenza vaccine efficacy to vary. Vaccine strains need to be updated annually because influenza viruses go through genetic alterations and evade the immune system. The antigenic similarity between the vaccine strains and viruses affects how protective the currently approved vaccines are each year. The host immune system can alter the vaccine's efficacy as well. Young people and the elderly, for instance, are more susceptible to influenza illness (12-14).
The antigen affinity between the vaccine strain and the strains that are currently spreading determines how well the annual flu vaccines work. The virus poses a number of challenges, including the potential for new strains of old endemic viruses and the need for potent, cross-protective influenza vaccines. Targeting the conserved sections of the virus could help with the goal in developing a new formulation that successfully produces the neutralising antibodies and offers cross protection (15,16).

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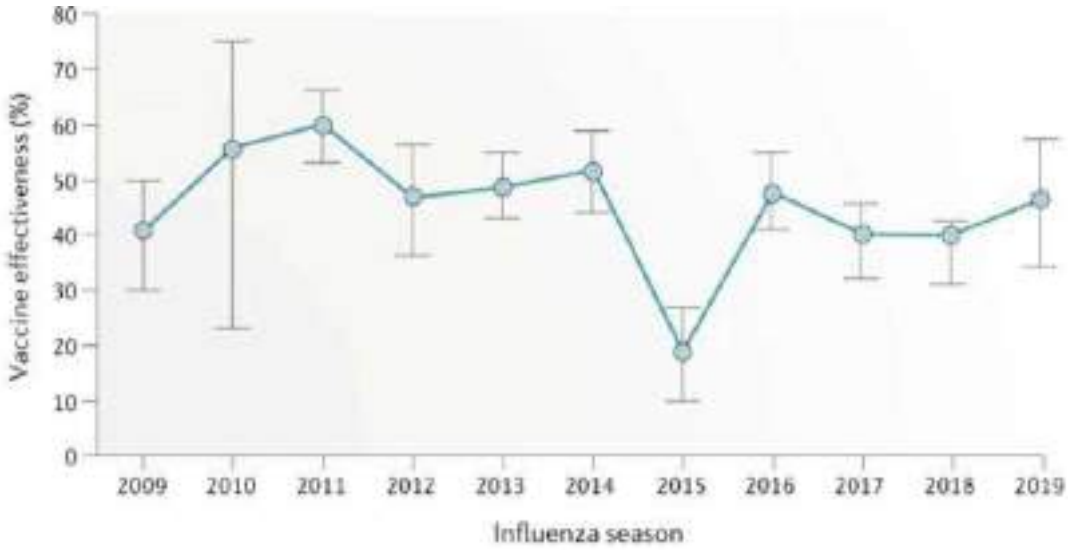

Seasonal influenza vaccine effectiveness from 2009 to 2019

LICENSED VACCINES

Vaccine technology/platform	Vaccine type	Vaccine name (manufacturer)	Target/ MOA	Adjuvant used
Inactivated virus	Split virus	Afluria (Seqirus)	HAI	None
		Fluarix (GSK)	HAI	None
		FluLavel (GSK)	HAI	None
		Fluzone, Fluzone HD (Sanofi Pasteur)	HAI	None
		Fluvirin (CLS Limited)	HAI	None
	Subunit	Flucelvax (Novartis)	HAI	None
Live-attenuated	Live, cold-adapted	FluMist (AstraZeneca)	HAI	None
Recombinant protein	Non-purified HA	FluBlok (Sanofi Pasteur)	HAI	None
Inactivated virus	Split virus	Influvac, Imuvac (Abbot)	HAI	None
		Fluarix, Alpharix, Influsplit (GSK)	HAI	None
		3Fluart (Omninvest)	HAI	None
		Afluria, Enzira (Pfizer/CSL)	HAI	None
		Vaxigrip, Vaxigrip Tetra (Sanofi Pasteur)	HAI	None
	Subunit	Agrippal (Seqirus)	HAI	None

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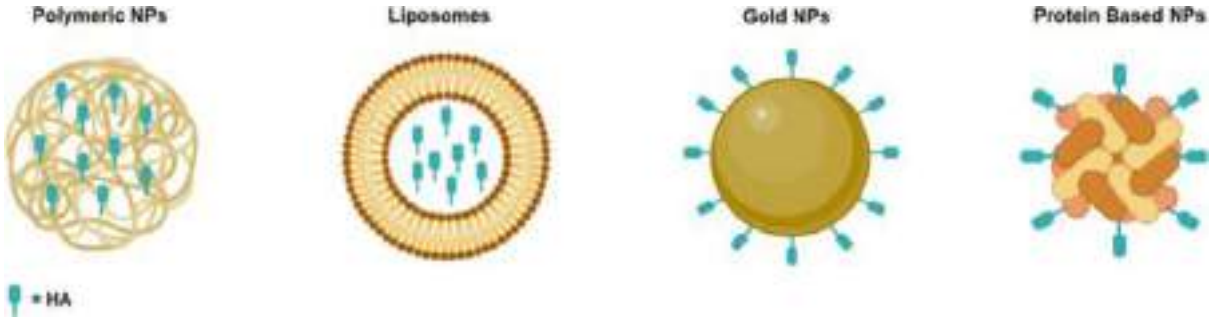
NANOPARTICLES AS A VACCINE CARRIER SYSTEM

An effective immunological reaction against the encapsulated antigen has been induced by the nanoparticle (NPs) based vaccine delivery systems. The antigen must be internalised and digested by APCs as the initial step in any successful vaccination. The APCs effectively phagocytose the particulate NPs carrying the antigen because they are particle. NPs can be used as a vaccine carrier system to help transport an immunogen to antigen-presenting cells with precision, prevent vaccine components from being prematurely degraded by proteases, increase stability, and elicit sustainable release (APCs). Nanoparticles can frequently function as a vaccine adjuvant because of these qualities. Protein-, metal-, polymer-, and liposome-containing NPs will be separated out (17).



For influenza vaccinations, various nanoparticle formulations using HA as the model antigen are used. Antigen can also be conjugated to the outside of polymeric nanoparticles, as is the case with the antigen-encapsulated polymer nanoparticles that are shown. Antigens can also be coated on the outside of liposomes, as is the case in the aqueous phase, where liposomes are also seen with encapsulated antigen. Surface conjugation is used to show protein-based nanoparticles (ferritin) and gold nanoparticles (18).

CHARACTERIZATION OF NANOPARTICLES

When comparing NPs, there are a number of physiochemical properties that can vary different platform but also affect how the NPs interact with APCs and other immune cells (19).

- surface charge
- particle size
- loading capacity of the particles
- drug release

VACCINE EFFICACY IN VIVO

In vivo testing is necessary to determine the vaccine's efficacy after the particles have been created and optimised with the antigen and/or adjuvant. Pigs, ferrets, and chickens have also been used to test NP universal influenza vaccines, with ferrets being the most effective larger animal model for influenza. Mouse models are the most frequently used in influenza vaccine testing. Because they are considered to be the most effective for that peptide, BALB/c mice models are the most commonly used for testing NPs with M2e (20).

POLYMERS

In NPs, vaccine components have been encapsulated in a variety of polymers, and the formulation's primary benefit is the controlled release of the antigen and/or adjuvant. The encapsulates are distributed throughout the polymer, including at the polymer surface, in the bulk of matrix devices made of polymeric formulations. Single or double emulsions with solvent evaporation are the most common method for fabricating polymeric nanoparticles. Vaccine NPs are made of the different polymers(21):

- chitosan
- PLGA
- acetalated dextran (Ace-DEX)

CHITOSAN NANOPARTICLES

Chitosan is a cationic, naturally occurring mucoadhesive biopolymer made of glucosamine residues. Chitin, a material found in shells of crustaceans, is partially deacetylated to create this biopolymer. Chitosan has been used as a needle-free vaccine

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to mucosal sites including IN, oral, and ocular because of its special mucoadhesive characteristics. Ionic gelation is a common technique for creating chitosan nanoparticles. Chitosan that is positively charged is ionically crosslinked with a salt that is negatively charged (e.g., sodium tripolyphosphate, sodium citrate, sodium sulfate). This is commonly achieved by dripping the chitosan mixture into the salt solution, however microfluidics and simple mixing are other viable options. This method is similar for making NPs from charged polymers like alginate (22).

PLGA PARTICLES

PLGA is one of the most commonly used and explored polymers in vaccine and medicines release due to its biocompatibility and biodegradability. The FDA and European Medicines Agency have currently approved PLGA for controlled drug release. Although PLGA is frequently used as a vaccine carrier in pre-clinical settings, limited research has been done on it in relation to influenza vaccines. Solvent evaporation methods using single and double emulsions are commonly used to make PLGA particles. The antigen or water soluble adjuvant is dissolved in an aqueous phase while the polymer is dissolved in an organic phase in a double emulsion solvent evaporation technique. The polymer and an organic soluble adjuvant may dissolve together in the solvent phase. Typically, an emulsion requires an emulsifying agent or stabilizer, most commonly polyvinyl alcohol (PVA). In the presence of the stabilizer, one phase is suspended in the other and mixed rapidly through homogenization or sonication. A double emulsion is made by mixing the phases twice, each time with the help of a stabilizer. After the second mixing, the emulsion is stirred on a stir plate for a duration of time until the solvent has completely evaporated, at which point the particles are washed and collected via centrifugation in preparation for lyophilization and storage. The methods are the same for a single emulsion, with the exception that the encapsulates would need to be solubilized in the organic phase with the polymer and would only need to be mixed once, in the presence of the stabilizer. This method can be used to a wide range of hydrophobic polymers, and solvent exposure as well as fast mixing can denaturate protein antigens (24,25).

ACE-DEX MICROPARTICLES

Ace-DEX is a biopolymer synthesized from dextran where the pendant hydroxyl groups are converted into acetal groups. It is acid-sensitive. Once phagocytosed, the polymer's acid sensitivity causes fast intracellular release of cargo in the acidic phagolysosome environment (27). Additionally, Ace-DEX particles have shown to be stable at extremely high temperatures. Ace-DEX has been used in various preclinical applications, such as the delivery of adjuvants to enhance vaccine efficacy, therapies for Salmonella enterica infection, and scaffold-based interstitial delivery of chemotherapeutics for glioblastoma. Similar to other biomaterials like PLGA and poly-lactic acid, particulate Ace-DEX has similar cell toxicity and viability (PLA). Ace-DEX can be processed using a variety of techniques, including sonication, homogenization, and electrospray, to make polymeric particles for vaccines. A continuous method that provides simple scalability and better encapsulation efficiencies is electrospray (28).

LIPOSOMES

One of the most common NP formulations for therapeutic delivery is the liposome; however, their use in vaccines was not very common. Inflexal V, a liposomal-based influenza vaccine recognised, comprises an inactivated influenza virus encapsulated in a liposome. This mixture is commonly referred to as a virosome. The virosome formulation of Inflexal V can be delivered to a wider range of ages than some of the influenza vaccines that are currently clinically approved when compared to other influenza vaccines in terms of efficacy. At the laboratory scale, thin-film hydration is commonly used for the production of liposomes. With the use of water-soluble agents present in the solution, a lipid cake is formed for this method and then rehydrated. Then, this solution is mixed through stirring or even more effective methods like sonication. After that, extrusion is used to size and form multilaminar liposomes into unilamellar liposomes. Microfluidics and electrospray can also help this process. At the industrial level, ethanol injection usually involves the introduction of ethanol with suspended lipids into a stirred tank with the encapsulate in an aqueous phase (30-31).

METALS

Chemistry that covalently attaches the antigen or adjuvant to the surface can be used to add antigen and/or adjuvant to metal-based nanoparticle carriers. The use of simple adsorption is also another approach, however it is a dynamic process in which proteins in particular can adsorb to and diffuse off the surface over time. Metal-based particle systems have the advantage of presenting antigen on their surfaces, and gold nanoparticles have been used to study how surface-bound antigen contributes to the development of universal influenza vaccines (32).

GOLD NANOPARTICLES

Gold NPs have been used in a variety of applications due to their small dimensional size, biocompatibility, and good stability. Furthermore, the material offers simple synthesis routes for attaching a wide variety of compounds to the surface. Although they can be synthesized through the reduction of chloroauric acid, gold NPs are most commonly bought commercially.

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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Whereas polymers and liposomes, which can encapsulate antigen and adjuvant inside their matrix, gold nanoparticles require these components to be functionalized, usually through thiol chemistry (33).

One utilization of gold nanoparticles was for a universal influenza vaccine. An IN M2e vaccine was developed by Tao et al. using CpG as a soluble adjuvant attached to gold nanoparticles. The M2e was covalently connected to the 12 nm gold NPs, however for the vaccination, M2e that was both soluble and covalently attached was used. A dose-response in serum IgG, IgG1, and IgG2a was observed in mice who were vaccinated IN on days 0 and 21 with M2e conjugated NPs and CpG. When mice were challenged with PR8 at day 42, a dose-response was also seen, and 100% of the mice survived the challenge. The authors report titers and survival after the challenge at least 8 months after the initial vaccination to evaluate the vaccination's longevity. In a study that is very similar to this one, the researches indicate that when CpG was included to the vaccination, a stronger immune response was seen. They used the same formulation in a subsequent paper to show survival after challenge from the H1N1 pandemic strains A/California/04/2009, A/Victoria/3/75, and A/Vietnam/1203/2004 (34).

PROTEIN-BASED NANOPARTICLES

To treat influenza, protein-based NPs have been used. These protein carriers have the capacity to come together to form nanoscale structures, including particles. A ferritin-based protein-based nanoparticle is an example of a nanoparticle used for universal influenza applications (32).

FERRITIN NANOPARTICLES

Most living organisms contain ferritin, a protein that binds to and stores iron. It has been shown that the ferritin that can be isolated from Helicobacter pylori self-assembles into an octahedron with 24 subunits and a hollow interior. Specific amino acid residues can be used to link proteins in an equivalent manner to the surface of ferritin particles (i.e., aspartic acid). These residues are arranged in groups of three, spaced 28 apart, with eight of the groups outside the NP. The trimeric HA spacing is identical to this spacing (35).

Using ferritin nanoparticles (NPs), Corbett et al. conjugated H3 and H7 HA stalk trimers. Based on electron microscopy imaging, it was determined that the stalk ligated NPs had a diameter of approximately 20 nm. By characterising the stalk regions through antibodies binding, it was determined that the epitopes were conserved when added to the ferritin NPs. Only H3 NPs showed some cross-protective and neutralizing antibodies against H7, however mice vaccinated with H3 or H7 stalk NPs at 0, 4, and 8 weeks in combination with the Ribi adjuvant showed high levels of serum antibody titers against their respective subtypes. Additionally, when challenged with homosubtypic strains 4 to 8 weeks after the final boost, the NP-vaccinated mice had a 100% survival rate. This platform is currently in clinical trials for the evaluation of unadjuvanted H1 stabilized stalk ferritin nanoparticles as an influenza vaccine(35).

CONCLUSIONS AND FUTURE WORK

Both seasonal and universal influenza vaccines have been developed using a wide range of nanoparticle platforms. In comparison to other, more traditional formulations, the platforms increase overall vaccine efficacy in the animal models in which they have been tested. As these platforms advance, it will be important to test them against a variety of heterosubtypic strains to evaluate their real universality. As the field develops, many of the new platforms that have been developed to vaccinate against SARS-CoV-2 will probably also be used to vaccinate against influenza and universal influenza antigens. These include the FDA-approved mRNA-based lipid nanoparticles from Pfizer and Moderna for use in an emergency COVID-19 infection vaccination (36).

Some vaccines for the flu based on NP have entered clinical trials in recent years. For example, NP universal influenza vaccine ACAM-FLU-A conducted a phase I clinical study at Acambis Inc. (now Sanofi Pasteur). The M2e peptide, which creates virus-like particles (VLPs), is fused to the hepatitis B virus's (HBc) capsid protein in the vaccine. 90% of the participants experienced M2e seroconversion after receiving the vaccine, although this protection was short-lived and dropped over the period of ten months (37).

In comparison to non-formulated controls, it has been demonstrated that using nanoparticles in the formulation of universal influenza vaccines increases vaccine efficacy. NP-formulated vaccines provide a number of potential advantages versus non-formulated vaccines. For example, many NP formulations can target immune cells, shield cargo against degradation and clearance, and provide a prolonged release of their cargo. The effectiveness of these formulations might also be increased by new universal antigens and adjuvants. These vaccine formulations have the potential to lessen the financial burden and mortality linked to seasonal influenza outbreaks, while more study is needed to further explore the universality of these vaccines as well as long-term protection.

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EPRA International Journal of Research and Development (IJRD)
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EVALUATION OF THE EFFICACY OF IMMUNOMODULATING THERAPY FOR ACUTE OBSTRUCTIVE BRONCHITIS IN CHILDREN

Sh.M. Ibatova, A.Kh. Ergashev, D. Kh. Mamatkulova
Samarkand State Medical University, Republic of Uzbekistan

ABSTRACT

Among respiratory diseases, acute obstructive bronchitis (AOB) is common and leads to frequent relapses and severe complications. In young children, under the influence of infectious and other factors, various immunological changes are observed, therefore, the search and implementation of methods that have a corrective effect on the immune system in children with acute obstructive bronchitis is relevant. The aim of the study was to substantiate the use of immunomodulatory therapy in children with acute obstructive bronchitis. 65 children with AOB, 35 patients with acute simple bronchitis and 20 healthy children were examined. Children with acute obstructive bronchitis were aged from 6 months. up to 3 years, of which 39 (60%) were boys, 26 (40%) were girls. The number of T-lymphocytes (SD3), T-helpers (SD4), T-suppressors (SD8), as well as B-lymphocytes (SD19) was determined by a modified method (Yu.F. Garib, 1995). Immunological examination was carried out taking into account the nature of therapy: the 1st group of patients received traditional treatment with the inclusion of T-activin, and the 2nd group of children received only traditional treatment. In order to correct immunological parameters, patients with AOB were prescribed T-activin subcutaneously at the rate of 2 μg/kg of body weight daily for 5 days and the sixth injection a week after the injections. The use of T-activin against the background of traditional therapy has a pronounced positive effect, contributes to a more rapid reduction in the symptoms of intoxication and relief of various complications of the disease. Comparative analysis of the immune response indicators against the background of traditional treatment and with the addition of T-activin revealed a significant increase in B-lymphocytes (DM19) 12.9±0.76%, an increase in FAN 57.9±1.34% and normalization of immunoglobulins A, M, G. The use of T-activin in the complex therapy of children with acute obstructive bronchitis increases the effectiveness of treatment, contributes to the normalization of the immune status and prevents the development of relapses of the disease.

KEYWORDS: *acute obstructive bronchitis, children, immune status indicators,immunomodulatory therapy.*

INTRODUCTION

Among respiratory diseases, acute obstructive bronchitis (AOB) is widespread, leading to frequent relapses and severe complications. Under the influence of an infectious factor and other agents, various immunological changes are observed in children, and the ability to develop full-fledged post-infection immunity also sharply decreases [1,4,5,7,9]. Therefore, a promising area of research is the search and implementation of methods that have a corrective effect on the immune system in children with acute obstructive bronchitis [2,3, 6,8,10].

PURPOSE OF THE STUDY

To substantiate the use of immunomodulatory therapy in children with acute obstructive bronchitis.

MATERIALS AND METHODS

65 children with AOB, 35 patients with acute simple bronchitis and 20 healthy children were examined. Children with acute obstructive bronchitis were aged from 6 months. up to 3 years, of which 39 (60%) were boys, 26 (40%) were girls. The diagnosis of AOB was established according to the classification adopted in 1996 at the Russian Symposium of Pediatric Pulmonologists.

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The immunological study was carried out in the clinical laboratory of the SamMI clinic. The number of T-lymphocytes (SD3), T-helpers (SD4), T-suppressors (SD8), as well as B-lymphocytes (SD19) was determined by a modified method (Yu.F. Garib, 1995). The concentration of serum immunoglobulins A, M, G in peripheral blood was determined by the method of Mancini et al (1965). The phagocytic activity of neutrophils was studied using latex particles (Petrov R.V., 1988).

Immunological examination was carried out taking into account the nature of therapy: the 1st group of patients received traditional treatment with the inclusion of T-activin, and the 2nd group of children received only traditional treatment.

RESEARCH RESULTS

It has been established that in most children the disease occurs at the age of 3 months to 1 year. An analysis of family and hereditary history showed that 32% of sick children were born from related marriages, in 46.5% of children, relatives suffered from allergic diseases. An analysis of the initial premorbid background showed that in children with AOB, allergic diathesis was observed in 54.9%, anemia in 81.9%, rickets in 51.0%, paratrophy in 12.5% and malnutrition of I-II degrees – at 48.7%. It was revealed that the average body weight at birth in children with AOB significantly exceeded (more than 3.5 kg) those in children with acute simple bronchitis and the control group.

The main changes in cellular immunity were expressed in a decrease in the number of T-lymphocytes (DM3) 45.2±0.8 compared to children in the control group 57.3±0.9% ($p<0.01$). More often there was an increase in the content of B-lymphocytes (DM19) in patients with OOB 18.1±0.3 ($p<0.01$), which is significantly higher than data with acute bronchitis 16.1±0.7% ($p<0.01$) and in the control group ($p<0.01$). There was a trend towards a decrease in T-suppressors (DM8) in relative and absolute terms in AOB in children.

The phagocytic activity of neutrophils in the acute period of the disease is significantly inhibited in children with AR 45.1±0 ($p<0.01$). A particularly pronounced decrease in the increase in the phagocytic activity of neutrophils (FAN) was observed in children with relapses (3-4 times a year) of acute obstructive bronchitis. There was also a significant decrease in the phagocytosis index and the indicator of completed phagocytosis. Changes in the humoral link of immunity were accompanied by a decrease in the concentration of IgA ($p<0.01$) and IgG ($p<0.01$). An increase in the concentration of IgM ($p<0.01$) in children with AOB indicates that during the peak of the disease, the immune response is provided mainly by antibodies of the IgM class.

In children with AOB who were on the traditional method of treatment, the improvement in clinical symptoms and immunological parameters was less pronounced. Thus, the level of T-lymphocytes ($p<0.01$) remained low, the levels of B-lymphocytes ($p<0.01$) were high. The content of immunoglobulins did not reach the levels of healthy children.

In order to correct immunological parameters, patients with AOB were prescribed T-activin subcutaneously at the rate of 2 μg/kg of body weight daily for 5 days and the sixth injection a week after the injections. The use of T-activin against the background of traditional therapy has a pronounced positive effect, contributes to a more rapid reduction in the symptoms of intoxication and relief of various complications of the disease. Comparative analysis of the immune response indicators against the background of traditional treatment and with the addition of T-activin revealed a significant increase in B-lymphocytes (DM19) 12.9±0.76%, an increase in FAN 57.9±1.34% and normalization of immunoglobulins A, M, G.

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CONCLUSION

Thus, the use of T-activin in the complex therapy of children with acute obstructive bronchitis increases the effectiveness of treatment, contributes to the normalization of the immune status and prevents the development of relapses of the disease.

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EPRA International Journal of Research and Development (IJRD)
Volume: 7 | Issue: 12 | December 2022 - Peer Reviewed Journal

CAD, CAE, CAM СИСТЕМА И ЕЕ ВОЗМОЖНОСТИ

Р.М. Мамбетов, Р.А.Танжарова,
Алмалыкский филиал Ташкентского государственного технического университета
Р.Р.Умирзаков.
Национальный институт искусства и дизайна Камолиддина Беҳзода

Аннотация
В этой статье рассматриваются CAD, CAE, CAM системы и их возможности. Исследуется, как эти системы сегодня используются в сетях.
Ключевые слова: *CAD/CAE/CAM, система, CATIA, Solid Works, AutoCAD, Pro/Engineer, Solid Edge*

Известно, что при производстве товара к нему предъявляются основные требования, такие как короткие сроки выпуска товара на рынок, низкая себестоимость товара, высокое качество. Выполнение этих требований невозможно без масштабного использования технологий CAD/CAE/CAM.

В области машиностроения концепция системы автоматического проектирования (ALT) обычно применяется к системам CAD/CAE/CAM, в которых она относится к набору программ, реализующих задачи автоматизированного проектирования, производства и управления инженерными данными.

К настоящему времени практически все крупные предприятия мира широко используют в своей работе возможности вычислительной техники, то есть с помощью CAD, CAE, CAM систем. Данная система решает следующие задачи:

- Применение современных методов проектирования, т.е. методов многовариантного проектирования и поиска эффективных вариантов и оптимизации принятия решений;
- Повышение вклада творческого труда инженера-конструктора;
- Повышение качества проектной документации;
- Модернизация управления процессом разработки проектов;
- Проводить испытания с помощью электронных калькуляторов качественно и в короткие сроки.
- Сократить количество проверок и повысить проектное решение до уровня, достаточного для получения идеального образца, при этом сократив затрачиваемое время,
- Сегодня состояние технической системы в рамках системы автоматического проектирования усложнилось.

Первые САПР появились в 60-х годах. Именно в это время General Motors создала интерактивную графическую систему для подготовки продукции к производству.

В настоящее время существует ряд популярных CAD/CAE/CAM систем, а именно CATIA, Solid Works, AutoCAD, Pro/Engineer, Solid Edge и др. к.

Среди таких CAD/CAE/CAM комплексов Solid Edge ST представляет собой набор программ, состоящий из функциональных модулей, предназначенных для процессов проектирования и производства механических деталей и конструкций.

Программный комплекс Solid Edge ST6 обладает рядом удобств, в частности:

Единая электронная модель может использоваться на разных этапах процесса проектирования.

Вариационная технология может быть использована при моделировании твердых тел

В процессе проектирования можно проводить расчеты и анализ с использованием метода конечных элементов.

Возможен обмен моделями с другими типами ALT.

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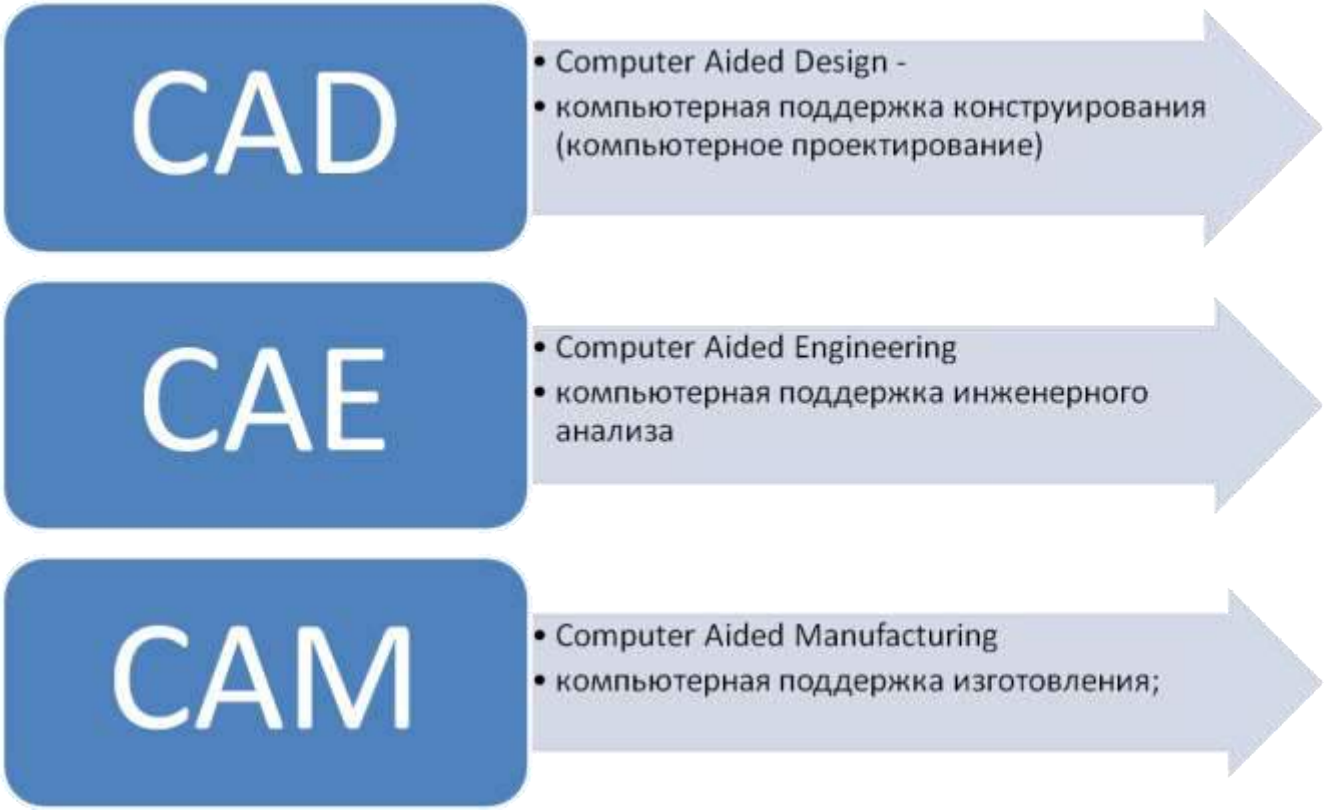
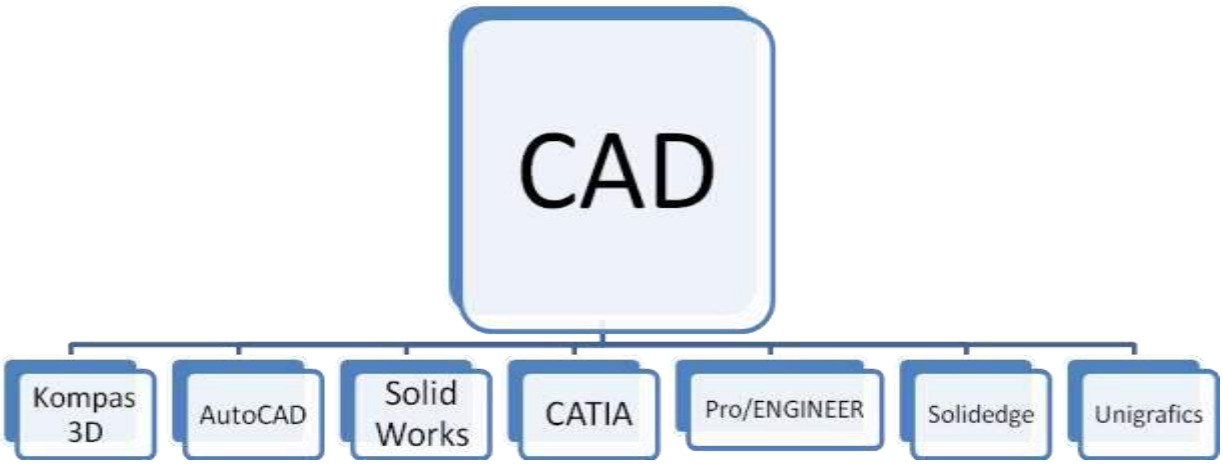
Системы CAD, CAE, CAM используются для комплексной автоматизации проектирования изделий, разработки конструкций и производства. По сути, три системы, используемые для разных целей, объединены, то есть разработаны на единой основе. Они описываются следующим образом:

Основой производства САПР является двумерное (2D) и трехмерное (3D) проектирование. 2D в основном предназначен для оформления конструкторской документации и чертежей.





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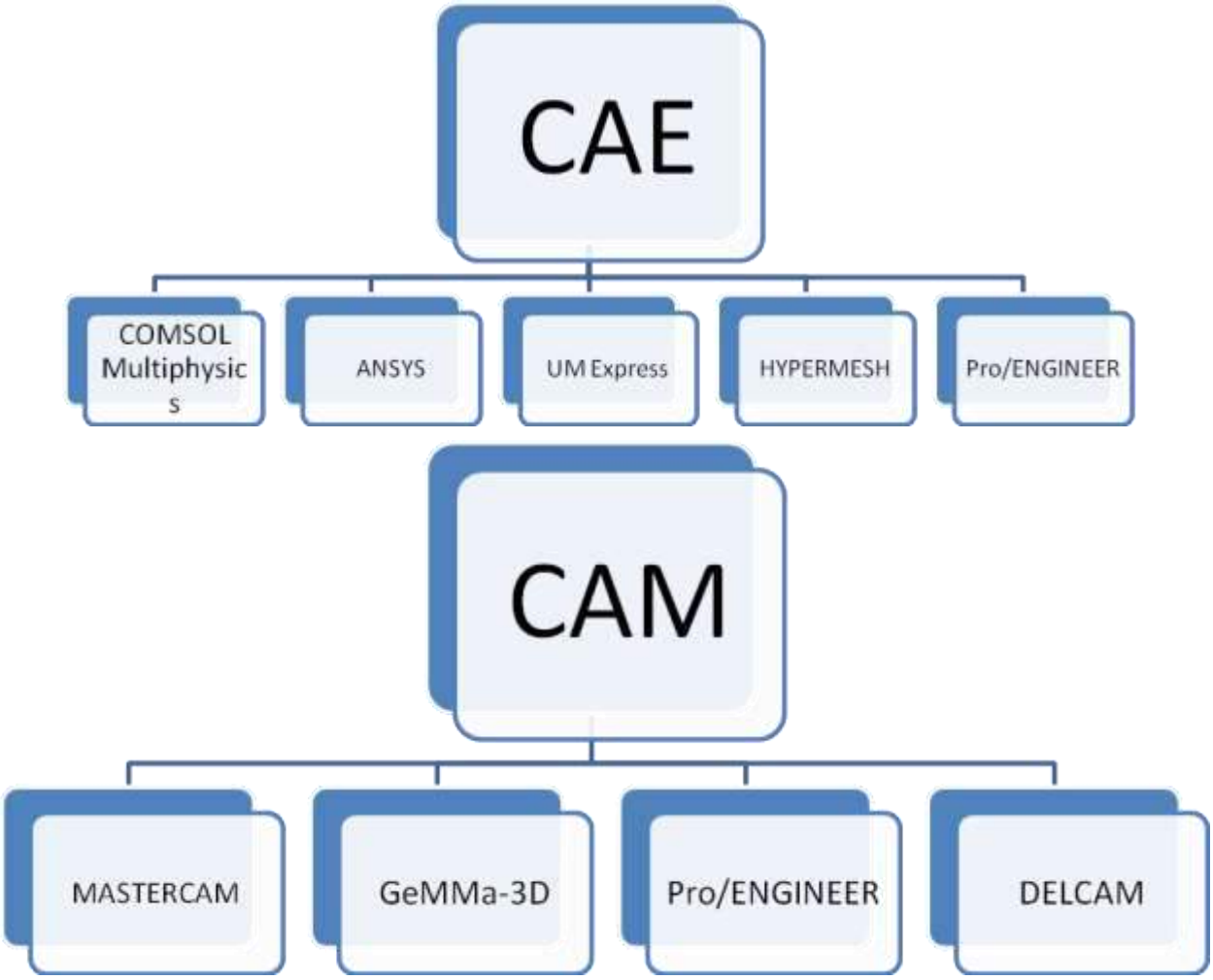

Основой производства САПР является двумерное (2D) и трехмерное (3D) проектирование. 2D в основном предназначен для оформления конструкторской документации и чертежей. А 3D позволяет создавать трехмерные геометрические модели, метрические расчеты и реальные виды.

Компас-3D является продуктом российской компании «Аскон» и предназначен для создания 2D и 3D моделей деталей и оформления конструкторской документации и чертежей.

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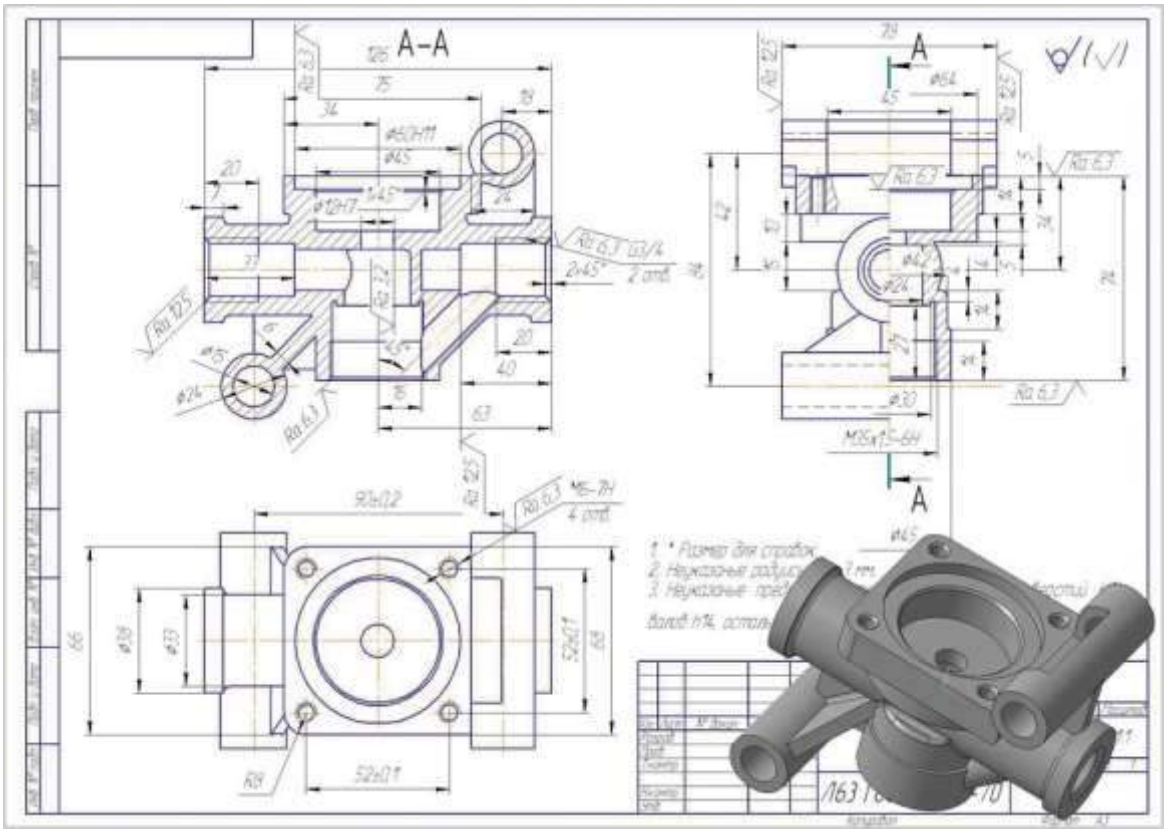

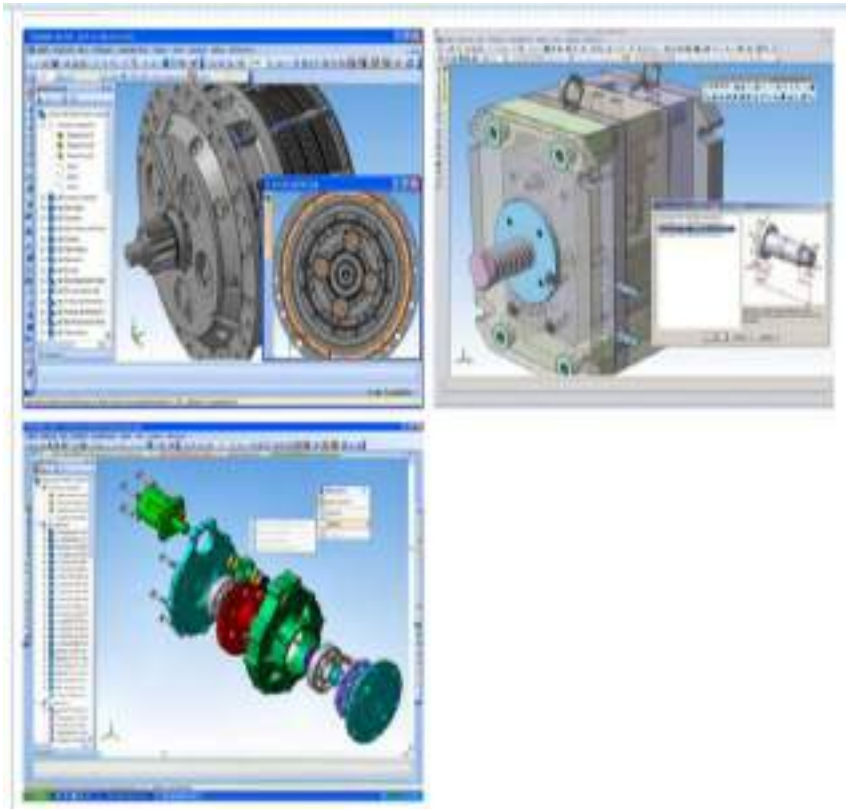

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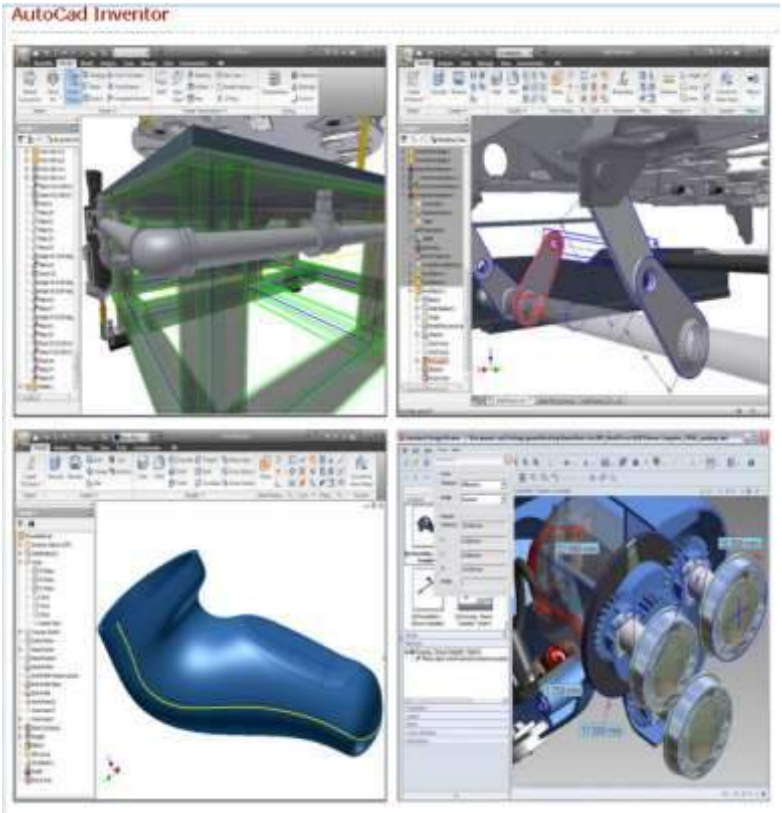
AutoCAD — продукт американской компании Autodesk, предназначенный для создания 2D и 3D моделей в области машиностроения, архитектурного строительства, оформления конструкторской документации и чертежей.



Программа Solid Works является продуктом американской корпорации Solid Works и является одной из самых удобных программ для гибкого проектирования параметров.

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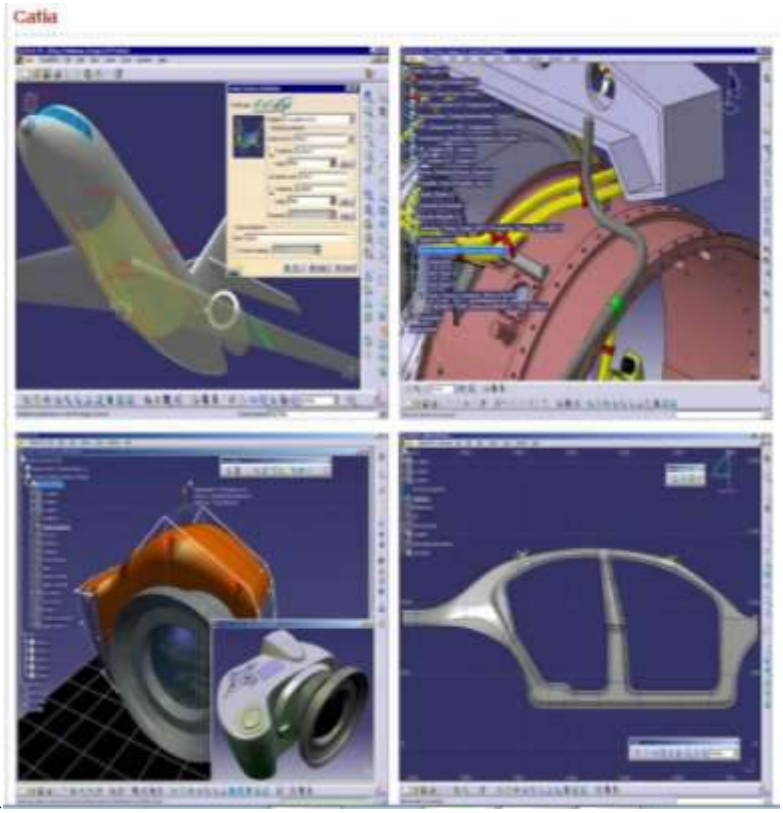
Программа Catia является продуктом французской компании Dassault Systemes и широко используется при проектировании авиационной техники, машиностроения, гидротехники и других подобных



областях.

CAE-система достаточно разнообразна и предназначена для оптимизации последовательности анализа проекта, моделирования и принятия проектных решений. Программы в этой системе в основном работают на основе метода конечных элементов, то есть анализируют процесс разделения объекта на большое количество частей с помощью метода распределения влияния.

Программа ANSYS является продуктом американской компании Ansys Inc. Это универсальная программа, работающая в системе конечно-элементного анализа в CAE-системе. Эта программа используется для выполнения анализов, связанных с прочностью, теплотой, электромагнетизмом, гидродинамикой и другими подобными областями. Кроме того, он широко используется в мире при решении линейных и нелинейных, стационарных и нестационарных задач механики и конструкции деформирования твердого тела, механики газа и жидкости, теплообмена и теплообмена и

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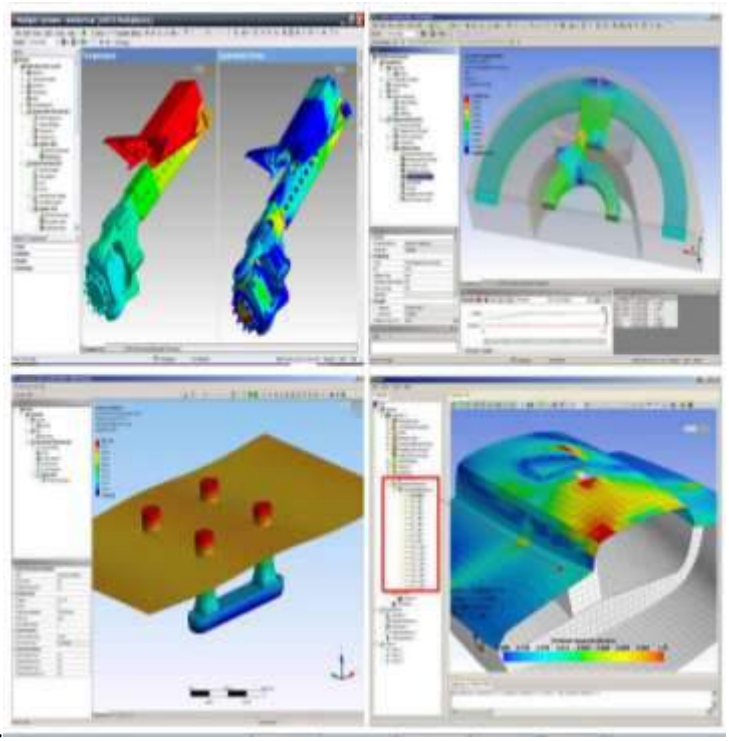
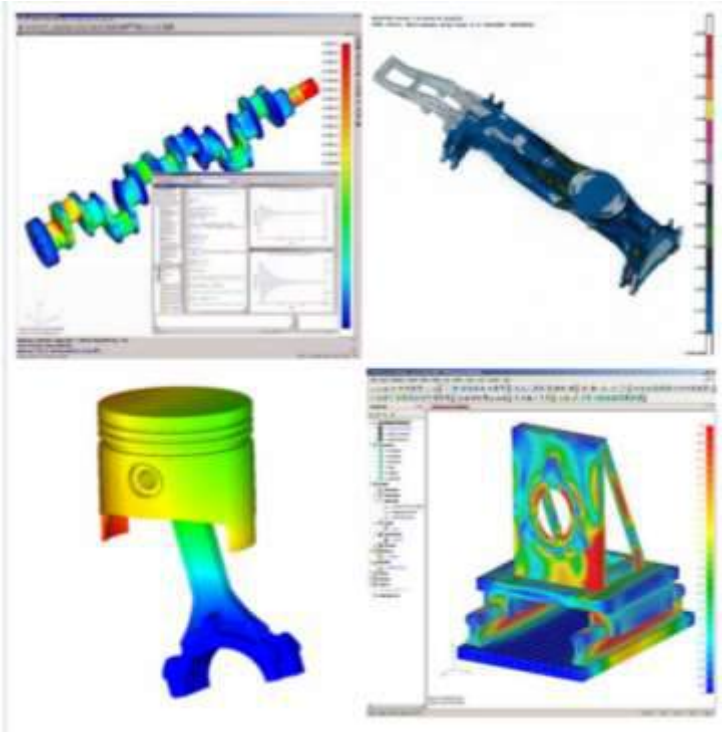


подобных задач.



Основная задача АСУП - разработать технологический процесс, синтезировать программу управления технологическим устройством, управляемым числовой программой, смоделировать процесс обработки и одновременно построить траекторию движения режущего инструмента и фрезы в процессе обработки. процесса, рассчитать расписание процесса обработки и т.д.

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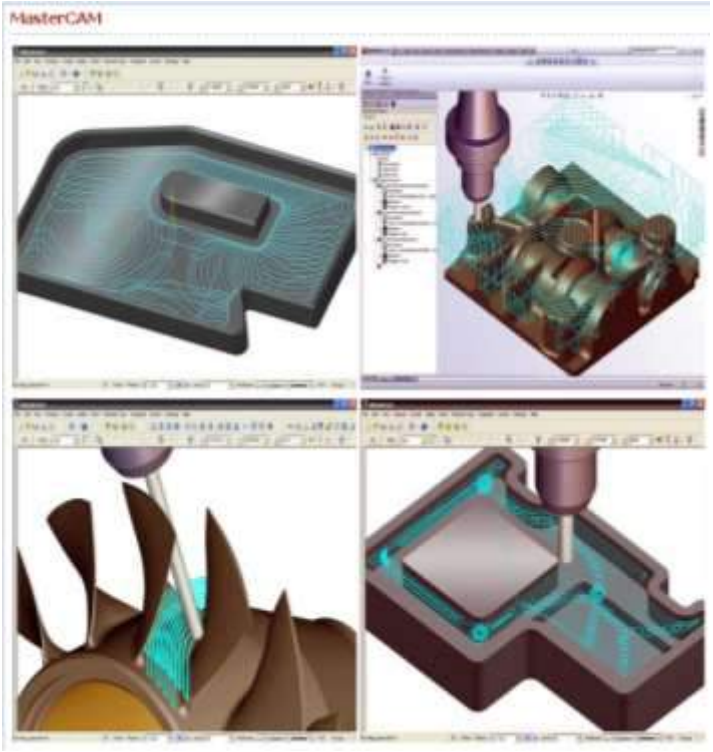
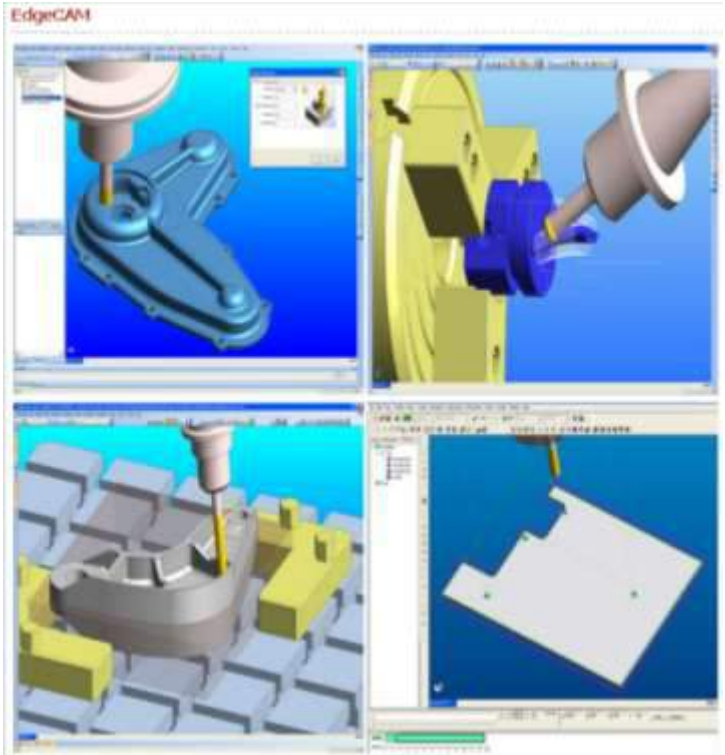
Из модели, созданной в CAD-системе, программы в CAM-системе разрабатывают технологический процесс для станков, управляемый программным обеспечением.

MasterCAM является продуктом американской компании CNC Software Inc., который представляет собой программное обеспечение для деревообрабатывающих, токарных и фрезерных станков с числовым программным управлением.





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Короче говоря, в сегодняшнюю быстро меняющуюся эпоху использование вышеупомянутых структур получило широкое распространение. Не будет преувеличением сказать, что не осталось ни одной области, которая бы не использовала возможности этого устройства. Поэтому в сегодняшнюю стремительно развивающуюся эпоху долг и обязанность каждого представителя отрасли усердно изучать цели и задачи этого устройства.

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THE IMPORTANCE OF DEVELOPING BOOK SKILLS IN PREPARING CHILDREN FOR SCHOOL EDUCATION

Ismailova Nilufar Isroidzhanovna[1], Sobiraliyeva Mushtari Nazirjan's Daughter[2]
[1]*Teacher of the Department of Preschool Education Methodology*
[2]*Preschool Education, 3rd Year Student,Namangan State University*

ANNOTATION
In this article, the development of book skills in preparing children for schooling, increasing their interest in reading, the ways of teachers and parents to be a role model for their children, the mental competence and spiritual maturity of children through books, highlights in detail the prospects for educating creative abilities, creativity thinking, mental maturity, competence-based approach to the personality of the child.
KEY WORDS: *Preparation for school education, childhood's golden library, travel to the world of books, working with books, book core, children's circle, listening, asking questions, children's library, enjoying books, making friends with books.*

The main task of developing preschool children's skills in working with books is to cultivate interest and love for books, the ability to communicate with them, listen to and understand literary texts, that is, the basis and foundation for educating a talented adult student and a literate person in the future. All these things. If 6-7-year-old children learn to read, they can perceive the book historically and critically, get absorbed in the author's intentions, and sometimes even argue with the writer. he can pour as much on the table as he can give.

When a child steps on the threshold of school, he should know his new social position, that is, the position of a school student, which has certain rights and obligations. This situation is expressed in the child's attitude towards school, educational activities, teachers, books and himself.

Research at the global level shows that in preparing children for school education, their physical, mental, and spiritual development, health protection; sets the task of creating conditions for the development of children's creativity, independence, and free thinking abilities.

Considering the pre-school period as a period of development of the skill of working with books, the first step in future literary development is the stage of formation of "Big, talented" student.

Comprehensive development of a child during preschool education and upbringing is the basis for significant achievements in general education. Therefore, one of the most important tasks of the preschool education organization is to prepare children for school education.

Preparing children for school education is not an easy process, each child must go through the entire preparatory process consisting of certain stages, only after that the school preparation will be successful.

Attempts to determine the specific content of the development of book skills in preschool children began in the 30s. released V. G. Belinsky, K. D. Ushinsky, V. A. Sukhomlinsky L. S. Vygotsky, A.V. Zaporozhets, D. B. Elkonin, B. M. Teplov, A. M. Leushina, N. A. Karpinskaya, R. I. Zhukovskaya, E. A. Flerina and others made theoretical and practical works in this regard.

F. Odoevsky wrote: "A child cannot learn everything he needs to know only from books. When reading a book, he always needs the explanations and comments of a skilled guide to learn the meaning of what he reads and thereby help him understand." That is why it is not enough to want the child to study well at school, but it is necessary to prepare the child to study well at school.

The knowledge, skills, skills and values that a 6-7-year-old child should acquire can be thoroughly taught with the help of books. One of the main factors in the development of logical memory and interest in knowledge of a six-year-old child is a book.

A person receives 20% of information with his eyes, 70% of which is through reading. By 1980, the amount of data was doubling every 5-7 years, and by 1990, it was doubling every year. By 2013, the amount of information will increase 4 times compared to 1990, and by 2040, it will increase 32 times. It is suggested that our contemporary should read in one year what he has read in his whole life in order to be aware of the news of science.

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When a child works with a book, he should have a lively, emotional relationship, see the described events, feel them with enthusiasm. The child draws any plot in his imagination, cries and laughs, imagines what he has read so vividly (sees, hears, smells and feels with his emotions) that he feels like a participant in the events. The book introduces the child to the world of the most difficult thing in life - human feelings, joys and sorrows, relationships, motives, thoughts, actions, characters. The book teaches how to "look" at a person, see and understand him, and educates human qualities. A book read as a child leaves a stronger impression than a book read by an adult. Children of preschool age get acquainted with various genres of Uzbek and world literature - fairy tales, rhymes, riddles, proverbs, stories and epics, narratives, parables, and continue to develop their feelings, hearing, and listening skills. special attention is paid to the development of an emotional attitude to literature, education of reading literacy and culture. Books serve to expand the child's understanding of the world, introduce him to things, nature, everything that surrounds him.

Modern children spend more time playing computer games and watching TV. Sociological research carried out in our country and abroad revealed negative trends: interest in reading books among children and teenagers of small preschool age has decreased significantly; the share of reading in children's free time has sharply decreased. Today, the urgency of solving this problem is clear. In order to raise a reader in a child, adults themselves must show interest in books, understand its role in human life, know recommended books for preschool children, be able to have an interesting conversation with children, and help in analyzing the work. The book is not a textbook, it does not give ready-made recipes on how to teach a child to love literature, which is one of the most important tasks of educators and parents, because it is very difficult to teach the complex art of reading and understanding.

"There is no enjoyment of the book," said S. Soloveitchik, "there is no reading, there is no reader." Flipping through the pages indifferently, coldly observing what is happening in the book is not reading. Admiring the art of the writer and poet, enjoying words and phrases, delighting in successful expression, marveling at the skill of image and description, excitement arising from the depth of thought - this is the pleasure of reading.

In preparing 6-7-year-old children for school, to continue developing the child's feelings, hearing, and listening skills through artistic works, to encourage the child to watch the book with interest; It is an important process to encourage people to pay attention not only to the pictures but also to the letters in the book, and to cultivate the passion for learning. Explaining to the child that the book is the most necessary source for gathering the necessary information; they are taught to recite some excerpts from a literary work, to read a memorized poem expressively.

Attention is paid to the development of the child's emotional relationship to fiction, the education of reading literacy and culture. To educate the child in the national spirit, we constantly use the examples of folk oral creativity: seasonal songs, funny songs, expressive songs. on the basis of reading, memorization, organization of fun games, interest in folk art and national melody is increasing. Cultivating a sense of respect for folk proverbs, achieving understanding of the deep meanings expressed in them. Teaching to answer riddles by thinking and thinking, introducing dates and quick sayings on a regular basis.

Getting interested in folk epics, reading small fragments, continuing to expand their understanding of epics. To continue to educate the child's interest in the life of our ancestors, to be proud of them. To strengthen the child's love for his native country through poetic works, to continue forming feelings of pride and pride in his heart. Expanding the child's scope of imagination, thinking, observation, developing artistic and aesthetic taste. To enjoy the figurative expressions, cheerful spirit, cheerful tone reflected in the poem; teaching to compare the scenes described in poems about nature with the real ones. To help adults, to learn a profession, to love and respect school and teachers, and to instill a desire to be an exemplary student. It is necessary to teach the ways of expressive poetry more thoroughly, to make people interested in the fact that there is a hidden treasure in books, to search for it and to find it.

It is difficult to overestimate the role of books in modern human life. The book offers great opportunities for understanding the human experience in the field of feelings, in the field of desires, in the field of thoughts and observations: in the field of feelings, in the field of desires, in the field of thoughts and observations. United with the feelings and thoughts of the author and his characters, we are in their place, we look at the world through their eyes, we experience what they went through, we evaluate the world with their own values. In recent times, society has turned its face to the book, which prompts us to understand and analyze the consequences of neglecting reading for years.

Why should a child work with a book, try to read?

The book evokes emotions. I.P. Pavlov emphasized that emotions are a unique and very powerful source of energy for a person. When reading a book, a child is happy, worried, surprised, sympathized, and all these emotions are necessary to make children happy.

Preparing children to study at school should first of all be focused on training the skills of working with books. Books build self-education skills. It is wisest for a child to know that no matter what question arises, the answer can be found in a wizard's book. Taking into account children's interest in books, the following tasks are set before pedagogues:

- to continue forming children's interest in books;
- creation of conditions for attentive listening and retelling of works of art;

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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- see the actions of the heroes and give them the correct assessment;
- development of imagination, the ability to mentally imagine the events and characters of the work;
- maintaining children's attention and interest in the words in the literary work;
- to support children's sympathy for the heroes of the work and to form a personal relationship with what they read.

We see the active development and improvement of the ability to perceive literary works, the formation of interest and love for books, that is, the successful formation of a child as a student. This situation forces us, teachers, to think carefully about the issues related to reading books to preschool children, first of all, choosing children's literature works for each age stage.

What is the task of adults around to ensure independence in effective work with books in preparing children for school education?

First, adults should remember that a lot depends on the child's attitude towards learning. Be sure to talk about what you read. Show interest, be surprised by some bright idea, be happy that you have learned something that was not available to you before.

Second, children need to see their parents reading books regularly. Their natural ability to imitate is important for the outcome of such a situation. If the child does not see the book in the hands of the parents, then it is inappropriate to ask the child to be interested in the book.

Thirdly, educate children in reading culture. If you start, read to the end. The book should be read sequentially, without jumping from page to page, without searching to the end. Try to explain to the child the importance of understanding everything that is read, and if something is unclear, ask. Pay attention to the expressiveness of the letter, vivid figurative language.

Fourth, there should be a children's library at home, which is periodically replenished with new ones. According to the results of the mentioned survey, 43% of schoolchildren read books from the home library. Children, like adults, cannot postpone their unmet needs for the future, they simply switch to other means of communication and recreation, that is, they are given to telephone, television, computer games. The home library should not only focus on the child's interests, but it should be diverse. The child may not yet understand the need for encyclopedias, dictionaries, reference books. But they should find a place on home shelves.

And finally, the effectiveness of increasing the place of the book in the child's life is effective in the cooperation of parents and preschool education organization.

Educators, parents, do not forget how important it is for your child to enter the wonderful world of reading. After all, the book teaches goodness and justice, reveals the beauty of the surrounding world, instills love for life, and gives the pleasure of knowledge.

There probably isn't a child who doesn't want to be read aloud to, and most parents are happy to read to their children, but few people believe that family reading is good for a baby's early development. they say: reading develops hearing, memory, strengthens reading. a parent-child connection that can encourage a child to study independently or inspire creativity. A child's imagination is always at work: often reading a book inspires a child to invent a continuation of his favorite story. You yourself listen with interest from the child to his options for the development of the next events in the book. Reading for the youngest is, first of all, communication with parents, in the terminology of the famous American psychologist J. Campbell, a period of "close attention" that is urgently needed for any child. The child appreciates the time when the father or mother leaves everything behind, puts the baby on his lap and reads a favorite book together. You can cling to your mother, hear her voice, empathize with your favorite characters, laugh at their adventures.

It is desirable to familiarize the child with children's literature every day in a free form, at least 30 minutes a day. After all, the book unintentionally explains the life of society and nature, the world of human relations. The book develops the child's thinking and imagination, enriches the child's feelings, helps to understand the beautiful images of the national and world literary language.

A child should be taught from a young age to look at a book as the greatest value, to hold it in his hand correctly, to read it correctly, to know its place on the bookshelf, to remember its name. When working with children of preschool age, we give a special place to pictures in understanding the text. They help the child to understand the read text. When listening to fairy tales, children first of all make connections when the events clearly follow each other and the next one follows logically from the previous one. This construction of the plot is typical of many fairy tales that are read and told to children of preschool age. To understand the work, the child no longer needs a picture for every turn of the plot. Describing the characters, children often express correct judgments about their behavior, while relying on their ideas about the norms of behavior and enriched personal experiences. At the same time, when perceiving literary works, the child does not set himself the task of evaluating the hero and events. Children's attitude to literary facts is active and vital. A 6-7-year-old child is primarily an active participant in the described events; experiences them along with the characters.

Activities dedicated to introducing children to literary works require advance preparation from the teacher. Conditionally, the following stages can be distinguished:

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- preparation of the educator to read the artistic work;
- determining reading (story) tasks depending on the nature of the literary work;
- choosing methods of working with the book. Preparing children for comprehension, the teacher reads the text expressively. This part of the training is very important and responsible - here the first meeting of the child with the work of art takes place. The next stage is a conversation about what was read. Children easily join in such a conversation with pleasure, because it satisfies their need to talk about what they have read, share their impressions, and express their feelings.

The teacher's questions about the work allow children to determine how they emotionally react to events, events, and characters. These questions, as a rule, are asked at the beginning of the conversation, they enliven and enrich the first, immediate impressions that children have when listening to the work.

The second questions focus on revealing the main idea of the work, its problem. Asking such questions helps the teacher to see how well the children understand the content of the work. It is useful to read individual parts of the work during the conversation. This type of repeated reading helps children understand what they missed when they read the text the first time.

The third questions are problematic and investigative in nature, focusing children's attention on the reasons for the characters' actions. Problematic questions force the child to think about the causes and consequences of the actions of the characters, to determine the inner motives of the characters, to notice the logical pattern of events.

The fourth questions focus children's attention on means of language expression. These questions attract the child to observe the language of fiction, its figurative emotional structure. The following questions focus on content reproduction. Answering these questions, the child remembers individual episodes and facts and builds them logically. The use of questions depends on the age of the children. And the last questions encourage children to elementary generalizations and conclusions. They usually end the conversation. The purpose of such questions is to awaken in the child the need to remember and understand the work once again, to emphasize the most important, main thing. Why did the writer tell us this story? What would you call this story (fairy tale)? Why did the writer name the work like that? Thus, the questions asked to children during the conversation after reading encourage them not only to remember the literary material, but also to think about it, implement it, and express in words the thoughts and impressions that arose during listening.

Let's find out how to effectively choose books for children, what to pay attention to first.

1. In terms of hygiene and safety, the book must be of excellent quality. High quality paper, flawlessly printed text, very large font. Do not deface or erase the text.

2. External attractiveness. Images should be clear and realistically convey the appearance of the image. “Pictures” are a continuation or confirmation of the verbal sequence and should help the toddler to manage what is written.

3. Make sure the book is age-appropriate for your child.

4. Modern translations of works familiar to us from childhood. For example, Little Red Riding Hood brings a “funny drink” to her grandmother, and the pigs sing very obscene songs ... Read the book carefully before buying.

A permanent negative attitude to reading and to books in general can appear when a child is taught to read, but books are almost never read to him. And this, unfortunately, is the current situation. How to teach a child to read? Let's try to catch up.

1. Personal example. If a child always sees his mother with a glossy magazine in her hand, and his father is buried in a computer monitor, it is unlikely that he will like to read. And if you like to read, know many authors and works, you can quote some lines, the child will be attracted to the same thing.

2. The right to choose. Don't force your child to read a book he doesn't want to. Parents are often afraid that their children will choose a “bad” book, so they insist on literature that they like. In this case, you can try to compromise: the child chooses one book according to his taste and reads another one on the advice of his parents.

3. Electronic books. As a rule, modern children are not indifferent to various technical innovations. Try to instill a love of reading with the help of e-books, called reading gadgets, where you can download any work. Of course, they do not have the charm of ordinary books - the rustling of pages, colorful pictures. However, our children are different, so let them choose comfortable books.

4. Success of “Stars”. There is another way to teach a child to read - to refer to a hero who is not indifferent to your child. Many actors and famous musicians, athletes, businessmen in their interviews recall with pleasure their impressions of the books they read, the moments taken from the works that inspired them or helped them achieve success. Sometimes just one mention of the reasons for the success of their favorite characters is enough for a child to pick up a book.

5. Discuss the book you read together. This will help your child not only to cope with impressions, but also to express thoughts and feelings. If you are interested in the child's personal opinion, this will also increase the interest in reading.

6. A surprise in the book. Suggest a book you read as a child. Add a cute bookmark, postcard or book with a note of how much you love your child. Thus, in preschool childhood, it is important not to teach children the technique of reading, but to form the need to read books in them. Then, at the age of primary school, the child learns the ability to read easily and quickly.

Thus, a positive attitude towards the book and the reading process brought up in preschool age is the basis for a child's successful education at school. And the book becomes a good friend, adviser and helper of the child throughout his life.

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SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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Volume: 7 | Issue: 12 | December 2022 - Peer Reviewed Journal

EXPERIENCES OF SPOUSAL BEREAVEMENT: A QUALITATIVE STUDY FROM KASHMIR

Faheema Aziz[1], Humera Shafi
[1]*Research Scholar, Department of Psychology, University of Kashmir*
[2]*Associate Professor, Department of Psychology, University of Kashmir*

ABSTRACT

The death of a spouse at an earlier-than-expected stage of life has the potential to overburden the lives of women with multiple stressors. The Off-time conjugal bereavement brings the crisis-based disruption of one's identity as changes in relationships and once-established roles need to be re-evaluated. For women in Indian societies, it is more difficult. The prevailing culture, traditions, and customs in Indian societies present multiple problems for widows in their social lives. Majority of young widows spend their lives in the upbringing of their children. Therefore, broader understanding of bereavement among such women needs to have an insight into its impact on all the facets of their lives; their personal lives; their family lives and their social lives. The present study aims to understand the experiences of spousal bereavement while they are making adjustments to their lives in their personal and social dimensions.

The paradigm of constructivism was followed to answer the research questions of the present study. In-depth interviews were conducted with eleven participants who had experienced the death of spouses in their families. The time since the death of a family member was in the range of 2 to 5 years with a mean of M= 3.1 years. The data from participants was analyzed using thematic analysis (Clarke & Braun, 2013).

Reflecting on the experience of spousal bereavement, three super-ordinate themes; loss from an Individual Perspective, Loss from a Family Perspective and Loss from Social perspective, with following sub-themes: Depression, Devastation, Physical Impact, Deprivation in family, Uncertainty for future of children, Recurrence of Grief in Family, Negative Social Attitude, Excessive and Unwanted Intrusion in Families were identified in the research.

The findings reveal that spousal bereavement has significant consequences for the young women in their personal, familial and social lives. The deep psychological and physical impact of loss in their lives has implications for grief counselors and therapists. The deprivation and uncertainties such women feel in their families needs to be taken into account while providing support services to such women. The implications of loss in their social lives indicate that there is a need to provide social education about the rights of such women and inequalities faced by them in society.

KEYWORDS: *young, women, conjugal bereavement, constructivism, interviews, themes, sub-themes, thematic analysis*

BACKGROUND

In Indian families, the spouse has immense significance in the lives of women. The death of a spouse at an earlier-than-expected stage of life has the potential to overburden the lives of women with stressors they would never have envisioned for their future. For young Indian women, it is more difficult as they have to experience persistent abuse, discrimination, disinheritance, and destitution in their lives (Dasgupta, 2017; Owen, 2001).

The grief outcomes that have been observed among young widows in the previous studies include anxiety, depression, emptiness, hopelessness, fear, insomnia and a continuous state of exhaustion (Charlton et al., 2001; Kowalski & Bondmass, 2008; Stroebe et al., 2007). The previous studies observe that stressors in the lives of young women are greater than men whenever either lose their spouse and such problems are mostly linked to parenting, managing finance, other legalities, and problems related to changes in their social identities (Chami & Pooley, 2021; Gass-Sternas, 1994; Sevak et al., 2003).

Young widows have to handle stressors in a variety of domains including parenting, work, and in social contexts. They have to manage stressors like raising children, managing finances, and handling unfamiliar life pressures alone and such tasks they never envisioned dealing with them alone (Lowe & McClement, 2011; Worden & Silverman, 1993). The women who are unable to marry

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after losing their spouse have to carry out all the activities of their life alone that were previously shared with their spouses. Off-time conjugal bereavement becomes a crisis-based disruption of one's identity as changes in relationships and once-established roles need to be re-evaluated (Moos & Schaefer, 1986). There are usually few similar-aged exemplars surrounding them that provide them with the script to move on in their lives and the necessary support they need to move on in their lives. As such, psychological problems loom large in the lives of such women (Lopata, 2017; Worden & Silverman, 1993).

The additional stressor that has been observed to be associated with widowhood in Indian societies is the negative social attitude towards them. The prevailing culture, traditions, and customs in Indian societies present multiple problems for widows in their social lives. The problems that have been observed to be associated with widowhood among young women include abuse, disinheritance, financial difficulties, social isolation, social shame and being denied legal rights (Dasgupta, 2017; Owen, 2001).

It has been investigated in previous studies that once individuals have adjusted to death, the re-emergence of grief occurs throughout the lifespan of the deceased (Parkes, 1987). The grief responses are triggered at various points in life while making adjustments to new events in life as the individual is unable to share such experiences with the person (Parkes & Prigerson, 2013). Such a subsequent impact of bereavement on psychological health has least been investigated among bereaved women, especially in the Kashmiri context.

In the Kashmiri context, women are mostly economically dependent on their spouses and have to deal with huge economic problems after the death of their spouses. It has been observed that such women do not go for re-marriage and spent their lives mostly in the upbringing of their children(Dabla, 2010).

The broader understanding of bereavement among such women needs to have an insight into its impact on all the facets of their lives; their personal lives; their family lives and their social lives. The present study aims to understand the experiences of spousal bereavement while they are making adjustments to their lives in their personal and social dimensions.

CURRENT STUDY

The research on young widows is far less common than studies on widowhood at old ages. There remains the dearth of bereavement literature targeting the experiences of grief among young widows. It aims at extending the current knowledge on experiences of young widows in the social context of Kashmir. The purpose of the present study is to gain an insight into the stories of loss in the lives of young women experiencing spousal bereavement so that pertinent help can be provided to such individuals. The study needs to answer the following research questions: how do young women experience the loss of their spouse? What are the challenges experienced by them at the personal level, the familial level and the social level?

METHODOLOGY

A qualitative approach using semi-structured interviews was used to enable a deep exploration into the experience of bereavement. Phenomenology was used as a method of enquiry to elicit and interpret the experiences of individual participants (Creswell & Poth, 2016).

The participants were selected through convenience sampling procedures (through social media posts) and a snowballing strategy. A total of 11 participants participated in the interviews. The age of participants was in the range of 30 to 50 years with mean M=41.6 years. Time since the death of spouse was in the range of 2 to 5 years with mean M=3.1 years.

The interviews were audio-taped and then transcribed. Field notes and observations were also taken. Huge amount of time was taken to build rapport with participants while taking consent from them and during interview sessions. Confidentiality was maintained in handling information from participants. The names of the participants mentioned in the study are pseudonyms.

The technique of thematic analysis (Clarke & Braun, 2013) was used to identify themes in the data. The steps of analysis included: Familiarization with the data involving transcribing, reading and noting down main ideas in the transcript; Generating codes and collecting data relevant to each code; Generating themes after clustering codes with similar meanings; Reviewing themes and finally Producing the report.

FINDINGS

The feelings of loss and disruption in lives of bereaved individuals are portrayed under the following themes: *Loss from an Individual Perspective, Loss from a Family Perspective, and Loss from social perspective*.

Theme 1: Loss from an Individual Perspective:

Each participant experienced emotional journey after the death of their spouse. They described the emotions of depression, devastation, anxiety and guilt in their lives. They also described the physical impact of loss in their lives. Physical illness was the common physical response among the most participants.

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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Depression

After experiencing the death of spouse, the participants described that they experience sadness and included both general sadness and clinical depression.

"My life changed a lot after his death. I go along with my social life and carry on all the activities of daily life but there is always a deep sadness, a pain inside of me."

(Tasleema, 45 years, 3 years since loss)

"His presence in my life was a kind of privilege. I spent a lot and enjoyed everything I wanted. My life returned back to normal but the happiness is lost somewhere.. there is a sadness that prevails throughout".

(Tehmeena, 35 years, 5 years since loss)

"His illness and all the disruptions in life after his death drove me to depression.. I am taking medicines for my mental health"

(Rafiqa, 42 years, 4 years since loss)

"After his death, my mental health got deteriorated. I was taking anti-depressants for almost a year."

(Shabnum, 40 years, 5 years since loss)

Devastation

The participants described that their lives were devastated following the death of their spouse. Many believed that they never had expected that they would have to face the death of their spouse. It was so early for them to face the death of spouse in their lives.

"I got married to him only after I had passed my 12th grade. My friends who are of my age are enjoying their married lives.. I feel like a huge storm struck me and ended everything in my life."

(Hina, 35 years, 2 years since loss)

"We lived together for two years only. It was the time of life when I had many dreams and plans for the future life… his death brought devastation in my life… everything ended with him."

(Tehmeena, 35 years, 5 years since loss)

"He remained ill for a year. I tried everything to make sure that I could spend some more time of my life with him. This tragedy was something which I never thought would happen to me so early in my life."

(Rafiqa, 42 years, 4 years since loss)

Physical impact

Participants described the deterioration in their physical health after experiencing death of their spouse. They described that it was mainly due to the daily stress of managing tasks that were previously shared with their spouse and other stressor in life that befell them after losing their spouses. Some experienced physical illnesses too.

"Earlier, I managed so much of the daily activities in my life without feeling a bit of tiredness but now my health has reduced a lot. The problems and burdens of my daily life made me old."

(Tasleema, 45 years, 3 years since loss)

"I witnessed a lot after his death. I have to manage my job and take care of my children alone. I have to manage all the responsibilities alone and all such stresses of my daily life has taken toll on my health. The friends of my age look quite younger than me."

(Tehmeena, 35 years, 5 years since loss)

"A woman who loses her husband at a young age has to face many problems in her life. After his death I don't feel like I am the same person. Many physical ailments have affected me. I am getting treatments for my heart problems and high blood pressure."

(Shabnum, 40 years, 5 years since loss)

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Theme 2: Loss from a family perspective

Each participant described the perceptions of loss they had towards their families. They described the deprivation and uncertainty they felt for their families. The recurrence of grief in families is also evident in expressions of most of the participants.

Deprivation in family

There were the feelings of deprivation they felt in the lives of their children in the family. The deprivation was felt despite receiving support from well-wishers and relatives. Some expressed that death brought a loss of protection for their families.

"Everyone cares about us a lot.. my children are loved by their uncles more than they love their own children but the void and deprivation will always remain in our family. No one can take place of a father in the lives of children."

(Tasleema, 45 years, 3 years since loss)

"Living alone with my children gives a feeling of being protection less. It feels like a shelter less family."

(Tehmeena, 35 years, 5 years since loss)

"I fulfill all the needs of my children. I provide them with everything they need in their lives. My children still feel the need of father's support in their lives."

(Shabnum, 40 years, 5 years since loss)

"After his death, our family became vulnerable to many problems in our lives. It was as if we lost the protective support in our lives."

(Rafiqa, 42 years, 4 years since loss)

Uncertainty for future of children

There were anxieties and uncertainties for the future of their families. Some expressed feelings of inadequacy in upbringing of their children and dealing with stressors in their lives. Some were concerned about the financial security of their children.

"My children are very young to care for themselves. I have to manage the work at office and care for them at home. Had their father been alive, my concerns for their future would have been less. My concerns have increased for them. At times it gets very frustrating for me."

(Shabnum, 40 years, 5 years since loss)

"It becomes very difficult for a woman to manage all the parenting tasks after the death of her husband. Managing all the parenting jobs alone gets very difficult at times."

(Tehmeena, 35 years, 5 years since loss)

"My son is still in high school and the elder one passed his high school recently. The financial condition of the family is very low and we are left without the source of income. I am not able to decide whether I should allow my elder son to go for further studies. I am very concerned as they have a lot to achieve yet in their lives without the support of their father."

(Rafiqa, 42 years, 4 years since loss)

Recurrence of grief in family

There were moments in their families when they felt the absence of deceased in their lives. The events in their lives like attaining milestones or achievements in life triggered grief in the families. The absence was also felt at periods of festivities in their life.

"When my daughter passed her matriculate exam, both of us could not resist our tears even though it was the happiest moments of our lives. If he would have been with us, the day would have been different for both of us."

(Shabnum, 40 years, 5 years since loss)

"The day I celebrated the ear-piercing ceremony of my daughter, both of us were in tears and we hugged each other and cried. Those around us could not hold their tears too."

(Tasleema, 45 years, 3 years since loss)

"Celebrating the festival of Eid without him takes away the taste of celebration. The celebrations used to be different when he was with us. Both my children and me greatly feel his absence on those days."

(Hina, 35 years, 2 years since loss)

"Children love to celebrate festivals and important occasions in their lives with their parents. Their behavior has changed a lot since their father's death which gives me the feeling that they are missing him on such occasions."

(Tasleema, 45 years, 3 years since loss)

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Theme 3: Loss from Social Perspective

Each participant described the experience of loss as they view it from the perspective of society. The participants described the negative attitude they face in their societies. The excessive and unwanted intrusion in their family lives was also described by the participants.

Negative social attitude

They expressed the inequalities they face at the hands of their relatives. Some expressed the restrictions they face in their surroundings about the ways they dress and other activities.

"I was exploited by those whom I trusted a lot. I was given shelter by my close relatives after I left my in-laws house but they drained me of the financial savings without caring about the secure future of my children."

(Tehmeena, 35 years, 5 years since loss)

"My in-laws conspired against me and I had to leave my in-laws house. My children were denied the inheritance of their father and made us struggle for our sustenance."

(Tasleema, 45 years, 3 years since loss)

"A woman who is young and faces the death of her husband has to face many problems in the society. Every kind of behavior is questioned in the society. I have to be quite careful the ways I get dressed while coming out of the home."

(Hina, 35 years, 2 years since loss)

"Even if I have to go to a small distance, I come out wearing a burqa so that no one is able to recognize me. I do not want people to say anything wrong about my character."

(Shabnum, 40 years, 5 years since loss)

Excessive and unwanted intrusion in families

The participants expressed that intrusion of relatives in their families increased since they suffered the loss. They described that support came from some relatives in the negative way.

"After the death of my husband, I try to keep good relations with all my relatives but I always end up with too much intrusion in my family life."

(Rafiqa, 42 years, 4 years since loss)

"One has to face two kinds of relatives in life, those who really feel your pain and those who are in your relation but never feel the real pain you are suffering from. My in-laws come to visit my family to show their solidarity with us but at the end of the day, they question most of activities and leave no stone unturned to criticize us wrongly."

(Tasleema, 45 years, 3 years since loss)

"I live with my daughters since the death of their father and we never left each other. Whenever, I have to make important decisions for my children, many relatives come to me with their commands and advise. I have seen them many times making gossips about my family. Without a protective father figure, all the family secrets can come to the street."

(Shabnum, 40 years, 5 years since loss)

DISCUSSION

Reflecting on the experience of spousal bereavement, three super-ordinate themes; *loss from an Individual Perspective, Loss from a Family Perspective and Loss from Social perspective,* with following sub-themes: *Depression, Devastation, Physical Impact, Deprivation in family, Uncertainty for future of children, Recurrence of Grief in Family, Negative Social Attitude, Excessive and Unwanted Intrusion in Families* were identified in the research.

The participants experienced sadness that prevailed in their lives and some were diagnosed with clinical depression. Such a symptom is often cited in literature as the grief outcome (Charlton et al., 2001; Shuchter & Zisook, 1993; Stroebe et al., 2007) and the current study supports the evidence of such an outcome of grief.

Women at a young age have many dreams and expectations for their future lives. Such women have least envisioned the loss of a spouse and such an event deeply affects their identity. The participants expressed the death of their spouses as bringing devastation into their lives. Such findings are in line with the observations in previous studies on spousal bereavement(Lopata, 2017; Lowe & McClement, 2011).

Women usually experience more stressors than men after losing their spouse. At the young age such stressors are huge as there are increased burdens than losing spouse in the old age. The participants reported physical illnesses and reduced health and such a symptom can be related to the additional stressors alongside their grief that befell them. Such a physical impact of grief is often cited

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in the literature (Ball, 1977; Shuchter & Zisook, 1993; Stroebe et al., 2007). This adds to the literature on other age groups where an impact on health is observed.

The loss from the family perspective extends the literature emphasizing the individual perspective of loss. The perceptions of loss that participants had for their families give an insight into the collective feeling or an empathic feeling towards those related to the bereaved. It gives an idea of how and what such women wish for their families. The feeling of deprivation was felt despite receiving the love and care from close ones. The feelings of being protection less and shelter less gives an insight into the fact that women look upon their spouses as protective figures for their families. The finding supports the evidence from the previous studies that observe the protective role played by men in the lives of women in Indian societies. Loss of protection and fear in lives of women losing their spouses has been observed in the previous literature (Dasgupta, 2017; Gill & Singh, 1991; Owen, 2001).

The young women have very little opportunity to prepare for such a loss and there are little exemplars available for them to deal with such a loss in their lives. The feelings of uncertainty in their lives and having anxiety for the future of their children are indicative of such a fact. The concern about the financial security of their children gives an idea that women are still financially dependent upon their spouses in their families. It again the supports the evidence that women are vulnerable to financial change and insecurity after the death of their spouses in Indian societies(Mohindra et al., 2012; Sahoo, 2014; Trivedi et al., 2009).

The recurrence or re-emergence of grief in families is indicative of the fact that grief is a continuous process rather than in linear stages. Such a finding extends the literature beyond the linear stages of grief. Such findings on re-grief has been observed in the previous studies(Lowe & McClement, 2011)

The social perspective of loss gives an idea into how such bereaved women are viewed in the society. the findings on the social inequalities and facing restrictions and negative attitude in the society is indicative of the fact that negative social attitude towards women still prevail in our society. it supports the evidence from the previous studies that observe such inequalities in the lives of Indian women(Gill & Singh, 1991; Owen, 2001). The excessive and unwanted intrusion in the lives of such women give an insight into the fact that women are mostly considered inadequate to handle the responsibilities and other social roles. It highlights the negative face of collectivism in the lives of bereaved women. The findings support the evidence from previous studies observing such an attitude towards widows in Indian societies(Chen, 1998; Gill & Singh, 1991; Jensen, 2005).

CONCLUSIONS

The findings reveal that spousal bereavement has significant consequences for the young women in their personal, familial and social lives. There are limited studies that observe the bereavement in young women from all the three dimensions of their lives. The findings on the psychological and physical impact of loss in their lives have implications for grief counselors and therapists. The deprivation and uncertainties such women feel in the lives of their children needs to be taken into account while providing support and services to such bereaved women. There is a need to understand the impact on their social lives and provide the social education about the rights and inequalities faced by such women.

In kashmiri society where the deaths are more traumatic and in increased numbers among young people, there is a death of services for the bereaved individuals. There is a need to have a separate service for bereaved individuals so that appropriate treatment and counseling is provided to them.

The study was based on the limited number of bereaved women. In order to generalize the findings on the grief outcomes in such women, a large sample of such bereaved population needs to be considered for the future studies.

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EPRA International Journal of Research and Development (IJRD)
Volume: 7 | Issue: 12 | December 2022 - Peer Reviewed Journal

DIRECTIONS FOR USING COMPUTER TECHNOLOGIES IN TEACHING THE SCIENCE OF "DRAWING GEOMETRY"

M.A. Karimov[1], B.B. Yuldashov[2], Q.O. Fayzullaev[3]
[1]*Senior Teacher, Yangier branch of the Tashkent Chemical-Technological Institute*
[2]*Senior Teacher, Yangier branch of the Tashkent Chemical-Technological Institute*
[3]*Assistant, Yangier branch of the Tashkent Chemical-Technological Institute*

ABSTRACT
This article discusses the main directions of the use of information technology in teaching the subject "Drawing geometry". During the course, the efficiency of using Photoshop and Corel Draw programs was analyzed.
KEYWORDS: *drawing geometry, information technology, Photoshop, Corel Draw, drawings, drawings*

Currently, the development of working conditions in economic sectors is also dramatically changing the qualification requirements for specialists. Therefore, the issue of introducing effective teaching methods in the training of specialists who meet the demands of the times is extremely urgent. The role of information technologies in the training of highly qualified, competitive personnel with modern knowledge is extremely important. The use of information technologies in the teaching process is considered to be one of the most effective methods used throughout the world.

"Drawing geometry" is one of the main subjects in the training of future designers, artists or graphic specialists. Since this subject is directly related to graphics, the use of computer technology in teaching it can lead to good results. The structure and capabilities of a computer are naturally a convenient tool for working with graphics. Especially in modern computer technologies, such opportunities are organized at a high level. This article examines and analyzes the directions of using information technologies in the teaching of the science of "Drawing geometry".

Information technologies can be widely used in the teaching process, in particular, in the teaching of "Diagram geometry", including in the following areas:

(1) improving the quality of educational materials;
(2) individualization of the teaching process;
(3) rapid monitoring and objective evaluation of the acquisition;
(4) learner-centered learning management;
(5) creation of opportunities for independent study, introduction of distance education.

We will consider these directions separately.

(1) Computer technologies serve to increase the quality of educational materials, to enhance their visualization and presentation. First of all, various software tools related to computer graphics are used. Among such programs, Adobe Photoshop and Corel Draw programs can be used effectively.

Since the Adobe Photoshop program is designed to process "raster" graphics, it is used for the purpose of graphic processing of educational materials, filling them with the necessary visual elements. Graphical elements are processed on the basis of a raster or grid of points. Also, this program is used in the processing and improvement of previous materials.

With the help of Corel Draw computer graphics program, it is possible to prepare various drawings and pictures related to drawing geometry. In particular, creating a perspective drawing apparatus based on the Corel Draw program when passing the topic "Projection" or "Perspective image making" increases the visibility and comprehensibility of educational materials.

(2) Computer technology can be highly effective in individualizing the learning process. As an example, let's consider the use of computer networks in the educational process. By using a local educational computer network, it is possible to quickly monitor the learning levels of students, along with the transfer of various educational materials to them individually.

For example, when teaching point perspective, each student can be given several different exercises over a computer network.

An example. Point A is in the plane, and point V is in space at a height of d units above the plane. Make a perspective of points A and V (Figure 1).

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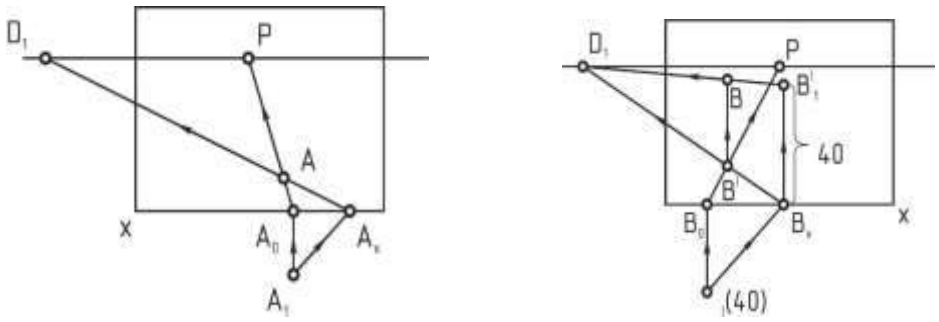

Figure 1. Making point perspective.

In this example, the height d given to each student will be different. The student will use computer graphics software to complete the example. The teacher monitors the process of the exercise and gives the necessary advice.

Practical exercise (Laboratory exercise). Determine the true length of the straight line section AV in the general situation given in perspective (Fig. 2). In this exercise, each student will have a different task. For example, the distance from a given cross-section to the image may vary. Also, the angle between the straight line on which the cross-section is located and the picture, or the length of the cross-section in perspective, is different.

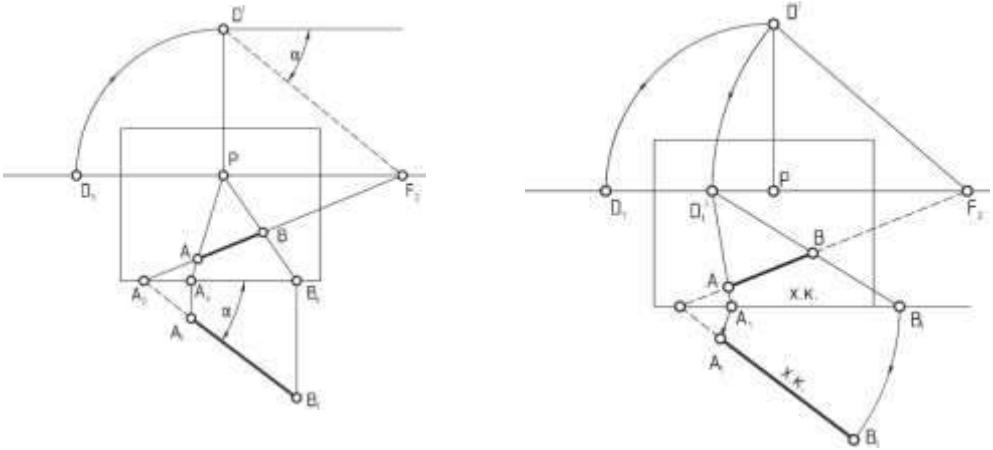

Fig. 2. Finding the true length of the straight line section AV in the general situation given in perspective.

Assignments are given to students in electronic form using a computer. The student uses computer graphics programs to perform the exercise and presents the result to the teacher in electronic form. The student performs the exercise independently. The teacher gives the necessary advice on how to do the exercise.

(3) In carrying out the above examples, the teacher will have the opportunity not only to observe, but also to quickly monitor and objectively evaluate the mastery. According to the training course, students perform a total of 6 practical exercises, and each exercise is evaluated on a 15-point rating system (one of the 6 exercises is evaluated with 10 points). The evaluation criteria are listed in the table below.

The table of criteria for evaluating practical exercises on a given topic in perspective science

№	Identification marks	In the 15-point system for intermediate and current assessment	Against a total of 15 points in %
1	Correct understanding of the task	3	25
2	Correct placement of the drawing in the row	2	20
3	Compliance with line types	5	25
4	Quality performance of the task	5	30
5	Total :	15	100

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The use of computer technologies in the organization of current and intermediate rating controls and processing of results helps to automate the rating process and increase its objectivity. In this matter, there are many interactive test computer programs that have been developed today. For example, such a test program is available in the electronic guide to teaching perspective created by the authors [1]. With the help of this program, it is possible to quickly and interactively determine the level of mastery of topics related to perspective. In addition, the student's scores from all controls are stored in the assessment database and combined with the final assessment to form a total score.

(4) Computer technologies make it possible to control the teaching process according to the student. In the e-learning manual for perspective learning mentioned above [1], it can be approached by the student himself or by the teacher depending on the level of mastery of the learner. In this case, the sequence of study of educational materials, the criterion of transition from one subject to the next, the parameters of the adjustment of the control test program are selected individually and the flexibility of the study process is ensured.

(5) Computer technologies in the teaching of the science of "drawing geometry" create opportunities for independent learning, and become the basis for the introduction of distance education. The electronic guide created by the authors [1] can fully provide such opportunities.

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EPRA International Journal of Research and Development (IJRD)
Volume: 7 | Issue: 12 | December 2022 - Peer Reviewed Journal

DIAGNOSTIC TERRITORIAL DE LA GOUVERNANCE LOCALE DES RESSOURCES EN EAU DANS LA COMMUNE DE TCHAOUROU

YETONGNON Judith Eric Georges ; KOUMASSI Dègla Hervé, GBENOU Victorin Vidjannagni
Laboratoire Pierre Pagney, Climat, Eau, Ecosystèmes et Développement (LACEEDE)
Université d'Abomey Calavi (UAC), République du Bénin

Article DOI: https://doi.org/10.36713/epra11984
DOI No: 10.36713/epra11984

RESUME

L'eau fait partir des ressources irremplaçables de ce monde. La gouvernance des ressources en eau est un domaine complexe à maîtriser en raison de la multiplication des usages. L'objectif de la présente recherche est de faire le diagnostic de la gouvernance locale des ressources en eau dans la Commune de Tchaourou.

L'approche méthodologique utilisée a consisté en la collecte des données, le traitement et l'analyse des résultats. Au total, 65 personnes ont été enquêtées par la méthode de choix raisonné. Cela s'ajoute 16 personnes ressources identifiées parmi les responsables et acteurs de gouvernance des ressources en eau. Ces données ont été collectées avec les questionnaires et les guides d'entretien. Les données collectées ont été traitées avec les méthodes de statistiques descriptives.

De l'analyse des données, il ressort qu'il y a une inégale répartition des points d'eau sur le dans la Commune: au total, 278 forages, 43 puits modernes, 5 adductions d'eau villageoises et 1 branchement de la SONEB (578 abonnés). Divers modes de gestion sont adoptés en fonction des types d'ouvrage installés. En termes de force favorables à la gouvernance locale, figure les conditions naturels favorables à la disponibilité des ressources en eau ; l'existence des textes et loi qui régissent la gestion du secteur de l'eau. L'existence d'ONG assurant l'intermédiation sociale (PASGOL, SIA N'SON et SOCIAL WATCH), la mise en œuvre progressive de la professionnalisation de la gestion des ouvrages d'eau potable par la commune et l'existence d'un Budget Programme par Objectif dans le secteur de l'eau constituent un atout pour la commune. Les faiblesses liées à la gouvernance sont à la mauvaise gestion des ouvrages hydrauliques; au coût élevé d'accès à l'eau; à la non-effectivité de la maîtrise d'ouvrage communale en matière d'eau; au déficit de communication et de mobilisation des populations autour des projets de développement. Les avantages liés à la disponibilité en eau dans la Commune de Tchaourou et ceux liés à la gestion de l'eau sont autant d'opportunités de gestion des ouvrages hydrauliques mais les inconvénients de la mauvaise gestion et de la répartition des ouvrages dans la Commune de Tchaourou ainsi que la non implication des populations à la base sont autant de menaces de la gouvernance locale des ressources en eau.

Mots clés : *Diagnostic, territorial ; gouvernance, locale ; Commune, Tchaourou*

ABSTRACT

Water is one of the irreplaceable resources of this world. The governance of water resources is a complex area to master due to the multiplication of uses. The objective of this research is to diagnose the local governance of water resources in the Commune of Tchaourou.

The methodological approach used consisted of data collection, processing and analysis of the results. A total of 65 people were surveyed using the reasoned choice method. This is in addition to 16 resource persons identified among those responsible for and actors in the governance of water resources. These data were collected with the questionnaires and the interview guides. The data collected was processed using descriptive statistics methods.

From the analysis of the data, it appears that there is an uneven distribution of water points in the Commune: in total, 278 boreholes, 43 modern wells, 5 villages water supplies and 1 SONEB connection (578 subscribers). Various management methods are adopted depending on the types of structures installed. In terms of forces favorable to local governance, there are the natural conditions favorable to the availability of water resources; the existence of texts and laws governing the management of the water sector. The existence of NGOs ensuring social intermediation (PASGOL, SIA N'SON and SOCIAL WATCH), the progressive implementation of the professionalization of the management of drinking water works by the municipality and the existence of a Budget Program by Objective in the water sector constitute an asset for the municipality. Weaknesses related to governance are

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poor management of hydraulic structures; the high cost of access to water; the ineffectiveness of municipal project management in terms of water; the lack of communication and mobilization of populations around development projects. The advantages linked to the availability of water in the Commune of Tchaourou and those linked to water management are as many opportunities for the management of hydraulic works, but the disadvantages of the poor management and distribution of works in the Commune of Tchaourou and the non-involvement of grassroots populations are all threats to the local governance of water resources.
KEYWORDS: *Diagnosis, territorial; governance, local; Commune, Tchaourou*

INTRODUCTION

L'eau fait partir des ressources irremplaçables de ce monde. Sans elle, ni les humains, ni les autres organismes vivants, ni les agriculteurs ne peuvent assurer la production des cultures vivrières ; les entreprises ne peuvent fonctionner (ZARGARPOUR, R, 2010, P140). L'eau demeure donc la base de toute forme de vie. Elle est à la fois habitat, aliment, moyen de production et de transport de personne et de bien (Meyizoun, 1994, P15). La pénurie d'eau en Afrique est une situation alarmante, qui ne fait qu'empirer. Alors que la population africaine continue de croître et que le changement climatique continue de priver le continent de cette ressource limitée, on prévoit que d'ici 2025, près de 230 millions d'Africains seront confrontés au manque d'eau et que jusqu'à 460 millions d'entre eux vivront dans des zones qui connaîtront un stress hydrique. Les ressources en eau, en particulier l'eau douce, vont devenir l'une des ressources les plus rares pour les humains et les sociétés (VIRCOULON, T. 2003, P38).

La gouvernance des ressources en eau dans les pays en développement (PED) constitue sans nul doute un enjeu politique, économique et social majeur que les gouvernements et les institutions internationales identifient comme prioritaire sur l'agenda politique du 21ème siècle (BIED-C.2006, P12)

Dans la commune de Tchaourou, l'approvisionnement en eau potable se pose avec acuité. La problématique de l'accessibilité en eau potable est confrontée aux problèmes de la faible couverture en infrastructures d'eau potable, à la non-effectivité de la maîtrise d'ouvrage communale en matière d'eau et à la gestion peu efficace des ouvrages. La gouvernance locale des ressources en eau dans la commune de Tchaourou, se traduit par l'implication de tous les acteurs (Etat, commune, secteur privé et population à la base) à divers niveau. Malgré implication de tous ces acteurs, dans la gouvernance de l'eau, les problèmes d'accès durable à l'eau se posent toujours dans cette Commune. L'objectif de la présente recherche est de diagnostic de la gestion des ouvrages hydrauliques dans la Commune de Tchaourou.

Située dans le département du Borgou, la commune de Tchourou est localisée entre 8°30 et 9°30 latitude nord et entre 2°2 et 3°1 longitude est. La commune de Tchaourou s'étend sur une superficie de 7256 km2, soit 28% de la superficie totale du département du Borgou et environ 6,5% du territoire national.

Elle est limitée au nord par les communes de Parakou, Pèrèrè et N' dali, au sud par la commune de Ouèssè, à l'est par la République Fédérale du Nigéria, à l'ouest par les communes de Bassila et Djougou.

2- APPROCHE METHODOLOGIQUE

La démarche méthodologique adoptée comprend : la collecte des données, leur traitement et l'analyse des résultats.

Les données utilisées sont les effectifs des points des ouvrages d'accès à l'eau, les types d'ouvrages hydrauliques obtenues à la mairie et auprès du gestionnaire des points d'eau. Les données socio anthropologiques des populations obtenues lors des enquêtes de terrain.

La collecte des données s'est faite en deux phases ; la recherche documentaire et les travaux de terrain. La recherche documentaire a consisté en la collecte des données, les articles, les revues, les cartes, les données quantitatives et qualitatives relatives aux modes et contraintes de gestion des ouvrages hydrauliques. Cette phase s'est faite dans les centres de documentations, des bibliothèques, des organismes, des services publics.

Les travaux de terrain ont été faits sur un ensemble de cible, les gestionnaires de point d'eau, les techniciens d'entretien des ouvrages, les responsables des ONG intervenants dans le domaine de la gestion de l'eau, les responsables des mairies. Un échantillon a été déterminé par de la méthode des quotas qui est fondé sur le choix raisonné et le caractère représentatif. Ainsi de 65 personnes ont été enquêtées dans les sept arrondissements que compte la Commune de Tchaourou. A cet effectif s'ajoute 3 agents du service départemental de l'hydraulique/Borgou (SDH/C), 3 chefs d'Arrondissement, 5 agents gestionnaires de l'eau de la mairie, 5 membres de responsable des structures de gestion des points d'eau. Cette phase a été faite grâce au guide d'entretien élaboré à cet effet.

Les données collectées ont été soumises aux traitements statistiques et les protocoles statistiques nous de faire le diagnostic de la gouvernance local des ressources en eau dans la Commune de Tchaourou.

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3- RESULTATS

3-1- Inventaire des ouvrages hydrauliques à Tchaourou

L'approvisionnement en eau dans la Commune de Tchaourou est assuré par les puits a grand diamètres, les forages (Forage muni de pompe a motricité humaine, Adduction d'eau villageoise et équivalent point d'eau). Le tableau xxx présente la synthèse des ouvrages d'accès à l'eau potable dans la Commune de Tchaourou.

Tableau I : **Synthèse des ouvrages d'accès à l'eau potable**

Arrondissements		FPM	Puits modernes	AEV	SONEB	Total	Taux
Alafiarou	10616	21	05	00	00	26	62,2
Béterou	25358	47	06	01	00	53	62,1
Goro	7247	09	00	01	00	10	72,4
Kika	35245	37	10	01	00	48	47,5
Sanson	17366	45	06	00	00	51	79,2
Tchaourou	31415	50	10	01	578 A	61	62,1
Tchatchou	42683	69	6	01	00	75	67,9
Total	169930	278	43	05	01	616	62,7

L'analyse du tableau 1 montre que les ressources en eau de la commune de Tchaourou sont inégalement réparties dans les arrondissements. Dans l'ensemble de la commune, la synthèse montre une inégale répartition des points d'eau sur le territoire: 278 forages, 43 puits modernes, 5 adductions d'eau villageoises et 1 branchement de la SONEB (578 abonnés). Le taux de déserte des ouvrages hydrauliques est de 62,7% dans la commune de Tchaourou. Ce taux cache des inégalités dans la répartition des ouvrages, en effet, l'arrondissement de Kika est le moins pourvu en ouvrage hydraulique (47,5 %). Par contre l'arrondissement de Sanson est le plus alimenté en ouvrage hydraulique avec un taux de desserte de 79,2 %. Les ouvrages hydrauliques sont gérés par la mairie conformément aux lois et textes régissant la décentralisation et aux textes sur l'eau en république du Bénin

3-2- Mode de gestion des ouvrages hydrauliques

Dans la commune de Tchaourou, il s'agit au départ d'une gestion communautaire qui correspond au contrat Association de consommateur. Elle consiste à mettre en place un comité appelé Comité de Gestion des points d'eau (CGPE). Les membres du comité sont élus au cours d'une assemblée générale. Le comité est composé de 5 à 7 membres et a pour mission de rendre compte de la gestion des ouvrages hydrauliques à la commune. Mais force est de constater que la gestion de ces comités a été catastrophique compte tenu de la mauvaise gouvernance de ces derniers.

Pour ce fait, la commune est passée de la gestion communautaire à la gestion déléguée depuis 2010: il s'agit de l'affermage ou contrat fermier.

Dans ce mode de gestion, la Mairie signe un contrat d'affermage directement avec un opérateur privé (fermier). Les usagers quant à eux ne sont pas forcément constitués en AUE. Si une AUE existe, elle n'aura pas de responsabilité directe dans la gestion de l'AEV et son rôle se limitera à celui d'une association de consommateurs susceptible d'interpeller la Mairie en cas de dysfonctionnement du système.

Les principales responsabilités du fermier sont les suivantes : Verser, au démarrage du contrat, une caution sur le compte « Eau » de la commune ;

• Exploiter les ouvrages et vendre l'eau à un tarif fixé par le contrat (tarif accessible aux consommateurs) ;
• Assurer le fonctionnement, l'entretien courant et la maintenance du système ;
• Verser une redevance pour le renouvellement et les extensions à la commune calculée sur la base du nombre de m3 produits et verser une redevance au budget communal ;
• Verser une redevance au Service de l'Eau dans le cadre de la loi sur l'eau. Dans ce mode de gestion, c'est la commune qui a la charge du renouvellement du système de pompage et de la réalisation des extensions éventuelles.

La perception d'une redevance. A ce niveau, la mairie, étant maître d'ouvrage, signe des contrats avec des privés appelés fermiers ou délégataires. Dans ce mode de gestion, les consommateurs n'ont pas de rôle direct et ne sont pas constitués en association.

L'entretien mécanique varie suivant le type d'équipement mis en place. En général, il consiste à faire l'entretien courant de l'équipement, afin que les usagers ne manquent pas d'eau; de même, il consiste à faire des réparations lorsque cela est nécessaire.

Quant à l'entretien sanitaire, il consiste à assurer quotidiennement la propriété autour du point d'eau et à observer les règles d'hygiène afin de protéger l'eau consommée contre toute pollution.

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Enfin, la bonne gestion financière consiste, d'une part, à collecter et à bien garder les cotisations ou les recettes (fonds collectés lors de la vente de l'eau) de la vente de l'eau; d'autre part, à faire des dépenses relatives au point d'eau. La réalisation de ces différentes tâches nécessite une certaine organisation.

3-3- Gestion des équipements modernes

Les équipements modernes que sont les puits modernes, les forages de pompes à motricité humaine, les postes d'eau autonome et les adductions d'eau villageoises sont généralement gérés par les délégataires et les comités de gestion de points d'eau (CGPE).

3-3-1- Gestion de simples ouvrages de fourniture d'eau: cas des forages de pompes à motricité humaine

3-3- 1-1- Gestion par délégation

Ce mode de gestion est proche du principe de la double délégation. Cependant, les responsabilités de la commune y sont plus importantes. La commune, l'AUE et l'opérateur privé (le fermier) sont tous les trois signataires du contrat. Dans ce mode de gestion, les responsabilités de l'opérateur privé sont les suivantes :

• Verser, au démarrage du contrat, une caution sur le compte renouvellement cogéré par l'AUE et la commune ;
• Exploiter les ouvrages et vendre l'eau à un tarif fixé par le contrat ;
• Assurer le fonctionnement, l'entretien courant et la maintenance du système ;
• Verser une redevance pour le renouvellement et les extensions sur ce même compte ;
• Verser une redevance à la commune et une redevance à l'AUE ;
• Verser une redevance au SH dans le cadre de la loi sur l'eau.

La commune et l'AUE cogèrent le compte renouvellement et décident ensemble des travaux de renouvellement et des extensions à réaliser. L'AUE, représentant les usagers, est chargée de veiller au respect, par le fermier, des termes du contrat.

La gestion par délégation est née suite à la mauvaise gouvernance des comités de gestion des points d'eau ou des associations d'usagers d'eau. Dans le secteur d'étude, le délégataire donne une redevance de 5000 F CFA par mois ou 60 000F CFA par an à la mairie. C'est le chef de service des affaires économiques et marchandes de la mairie qui est chargé de collecter les fonds auprès des délégataires et qui les dépose dans le compte de la mairie dans la rubrique destinée à l'eau. Le délégataire a plusieurs rôles, lesquels sont: exploiter les ouvrages et vendre l'eau aux consommateurs à un tarif fixé par le contrat; assurer le fonctionnement, l'entretien courant et la maintenance du système; verser une redevance à la mairie par mois ou par an.

Dans ce mode de gestion, les charges liées aux pannes inférieures à 30 000F CFA sont à la charge du délégataire, mais celles supérieures à 30 000F CFA sont prises en charge par la mairie. Les artisans réparateurs sont recrutés par la mairie et formés par le service de l'hydraulique villageoise.

3-3- 1-2- Gestion par comité

Dans la commune de Tchaourou, certains points d'eau continuent d'être gérés par les comités de gestion des points d'eau (CGPE) malgré le nouveau mode de gestion mis en place par la commune. La structure de gestion est un comité élu en assemblée générale. Ces comités sont composés de 4 à 5 membres qui sont:

- un président;
- un secrétaire;
- un trésorier;
- un responsable villageois de Pompe ;
- un responsable à la propriété.

Généralement, les deux ou trois derniers postes sont réservés aux femmes à cause de la bonne gestion observée à leur niveau selon l'un des répondants.

Quant à l'élection de ce comité de gestion de points d'eau, elle est faite souvent par le chef du village ou d'autres personnes influentes du village bénéficiaire de l'équipement.

Les membres du comité de gestion des points d'eau ne sont pas rémunérés pour le service qu'ils rendent; seulement, ils peuvent s'approvisionner gratuitement dans ces différents points d' eau. De même, ils ne sont pas investis d'un mandat parce qu'en cas de mauvaise gestion ils sont remplacés systématiquement par d'autres.

En somme, dans tous les arrondissements de la commune de Tchaourou, beaucoup de points d'eau sont mal gérés. Les réparations sont faites souvent avec des injures à l' égard des comités de gestion d'eau qui selon les populations sont des voleurs. Par ailleurs, les technologies modernes mises en place par ci et par là depuis des années par les responsables d'approvisionnement en eau potable des milieux ruraux ont fait leur preuve.

Elles nécessitent qu'un aménagement ou un renouvellement soit fait.

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EPRA International Journal of Research and Development (IJRD)
Volume: 7 | Issue: 12 | December 2022 - Peer Reviewed Journal

3-3- 1-3- Gestion des ouvrages complexes de fourniture d'eau: cas d'Adduction d'Eau Villageoise (AEV) et des Postes d'Eau Autonomes dans la commune de Tchaourou

Les ouvrages complexes de fourniture d'eau que sont les Adductions d' Eau Villageoises (AEV) et les Postes d'Eau Autonomes (PEA) sont collectivement gérés dans la commune de Tchaourou par les populations bénéficiaires organisées en Association des Usagers d'Eau (AUE).

Ce mode de gestion correspond au système actuellement mis en œuvre à la différence que, désormais, c'est la commune et non l'Etat qui délègue la gestion de l'AEV à une AUE.

Dans ce cas, l'AUE gère le fonctionnement, l'entretien, le renouvellement des infrastructures et les extensions de l'AEV. Comme dans l'option précédente d'une gestion directe par la commune, il semble préférable que l'AUE passe un contrat avec une société privée afin d'assurer les tâches spécialisées liées à la maintenance du système de pompage. Il est aussi envisagé que l'AUE verse une redevance ou une taxe à la commune et une redevance au SH dans le cadre de la loi sur l'eau.

Dans la commune de Tchaourou Cette association regroupe l'ensemble des habitants usagers d'eau, résidant dans un village de chaque arrondissement desservi par une AEV ou un PEA. Les missions de cette association sont notamment: promouvoir et réparer la réalisation d'une adduction d'eau villageoise; assurer le service public de distribution d'eau potable; représenter les usagers pour l'ensemble relatif au service d'eau potable; déléguer la gestion quotidienne du système à un exploitant et passer un contrat de maintenance; gérer les équipements, la pérennité et le renouvellement des équipements.

Pour assurer la gestion efficace de l'ouvrage, un comité chargé de la gestion des bornes fontaines est mis en place pour assurer l'entretien de la borne-fontaine et l'assainissement du site de son implantation. Aussi, il assure le recrutement et le suivi d'un fontainier, pour la vente de l'eau au niveau 'de chaque borne-fontaine. Le fontainier est rémunéré au prorata de la quantité d'eau vendue. Tous les comités de gestion des points d'eau se réunissent en assemblée générale pour former une Association des Usagers d'Eau (AUE). L'assemblée élit un comité directeur pour la gestion de l'AEV.

S'agissant des points d'eau autonomes où il n'existe qu'une seule borne-fontaine, un seul comité est mis en place, jouant à la fois le rôle de comité de gestion de point d'eau et de comité directeur.

Il revient à l'assemblée générale de l'AUE de choisir le mode d'exploitation, de fixer

Le prix de l'eau et d'approuver le budget prévisionnel proposé par le comité directeur. Dans la commune de Tchaourou, le prix de cession pratiqué par l'AUE varie en fonction de chaque arrondissement. Par exemple, au niveau de l'arrondissement de Tchatchou, le mètre cube (m^3) d'eau est fixé à 525 F CFA aux fontainiers. L'eau est vendue en détail aux ménages à 15 F CFA la bassine de 25 litres de capacité.

Un exploitant est recruté pour la gestion quotidienne de l'ensemble du système d'AEV. Il a pour fonction de produire, de traiter et de distribuer de l'eau. Il est chargé aussi de contrôler les fontainiers, de relever les compteurs et d'encaisser les recettes de vente d'eau pour le compte du comité directeur. Compte tenu des problèmes de mauvaise gestion des AUE, dans certains arrondissements de la commune de Tchaourou, l'exploitation des systèmes d'AEV est confiée désormais à un opérateur privé à travers le contrat d'affermage.

3- 4- Facteurs internes de la gouvernance locale de l'eau

Les facteurs internes sont les forces et faiblesses de la gouvernance locale des ressources en eau dans la commune de Tchaourou.

3- 4- 1- Forces de la gouvernance locale de l'eau

La commune de Tchaourou dispose d'importantes ressources en eau qui, bien gérées, lui permettront de desservir toute la population. Elle dispose d'un service technique pour la mise en œuvre des projets d'eau et le suivi technique et financier des ouvrages hydrauliques.

Dans la commune de Tchaourou, les acteurs communaux sont favorables à la maîtrise d'ouvrage communale des ouvrages d'eau potable et aux réformes nécessaires à une gestion pérenne desdits ouvrages. Selon l'article 108 de la loi 97-029 du 15 janvier 1997 portant sur l'organisation des communes en République du Bénin, il incombe aux communes de s'engager dans une démarche d'aménagement du territoire en vue d'assurer les meilleures conditions de vie à l'ensemble de la population. Elle doit pour cela planifier la réalisation des ouvrages d'alimentation en eau potable à partir des besoins réels des populations, ce qui permet d'avoir une vision globale de la desserte en eau de la commune. C'est dans cette optique que, depuis 2008, la commune de Tchaourou a opté pour l'approche par programmation des ouvrages hydrauliques, année par année, dans les localités non pourvues ou insuffisamment pourvues de points d'eau. Les conditions climatiques et hydrogéologiques de la commune favorisent la disponibilité en eau potable. L'existence d'un comité communal de l'eau présidé par le deuxième adjoint au maire constitue un atout considérable pour la commune en matière d'approvisionnement en eau potable. La protection des points d'eau est bien respectée par la Direction Générale de l'Eau (DGE). Pour assurer la couverture en eau potable dans la commune, la mairie a réalisé des infrastructures d'eau potable dans tous les arrondissements. Ceci s'explique par l'existence de forages équipés de pompes et des adductions d'eau villageoises. L'existence d'ONG assurant l'intermédiation sociale (PASGOL, SIA N'SON et SOCIAL WATCH), la mise en œuvre progressive de la professionnalisation de la gestion des ouvrages d'eau potable par la commune et l'existence d'un Budget Programme par Objectif dans le secteur de l'eau constituent un atout pour la commune.

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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La gestion des ouvrages hydrauliques est basée sur des contrats, ce qui permet désormais à chaque acteur de jouer pleinement son rôle. Ainsi, l'inventaire des forces de la gouvernance locale des ressources en eau dans la commune de Tchaourou se résume comme suit:

- ✓ Le climat, les eaux atmosphériques,
- ✓ les eaux de surface, les eaux souterraines,
- ✓ la biodiversité et la population;
- ✓ l'existence d'ONG assurant l'intermédiation sociale;
- ✓ la mise en œuvre progressive de la dynamique de professionnalisation de la gestion des ouvrages hydrauliques;
- ✓ l'existence d'une division de la SONEB;
- ✓ l'existence de forages équipés de pompes et d'AEV;
- ✓ la disponibilité des fonds pour l'entretien et la réparation des ouvrages;
- ✓ la disponibilité des artisans réparateurs;
- ✓ la disponibilité en quantité suffisante des pièces de rechange dans les magasins;
- ✓ la veille citoyenne à travers la société civile et la mise en place des Associations
- ✓ des Consommateurs d'Eau Potable.

3- 4- 2- Faiblesses de la gouvernance locale de l'eau

Suite aux observations faites au cours de notre recherche sur les ressources en eau de la commune de Tchaourou, malgré leur disponibilité sur le territoire, nous avons dégagé différents problèmes qui entravent la bonne gestion des ouvrages hydrauliques. Ainsi, notre recherche a permis d'identifier les problèmes se rapportant:

- ✓ aux actions anthropiques;
- ✓ à l'ignorance;
- ✓ à la mauvaise gestion des ouvrages hydrauliques;
- ✓ à la pauvreté;
- ✓ au coût élevé d'accès à l'eau;
- ✓ à la structure géomorphologique;
- ✓ à la non-effectivité de la maîtrise d'ouvrage communale en matière d'eau;
- ✓ à la faible couverture en infrastructures d'eau potable;
- ✓ au déficit de communication et de mobilisation des populations autour des projets de développement.

Les aléas climatiques et l'ensablement des cours d'eau affectent les sources d'eau superficielles et souterraines. Ceci rend difficile l'accès des populations à l'eau potable. L'insuffisance des points d'eau potables dans les localités et la mauvaise maintenance des ouvrages hydrauliques ainsi que la mauvaise gestion des points d'eau existants constituent des limites pour le développement de la commune.

En vertu de la loi n° 2001-07 du 9 mai portant sur la maîtrise d'ouvrage publique, la commune assure la maîtrise d'ouvrage publique des ouvrages d'eau. Cette compétence n'est pas totalement exercée par la commune de Tchaourou. En effet, la réalisation des AEV est jusqu'à présent assurée directement par l'État central à travers le Ministère en charge de l'eau. Les fonds nécessaires à la réalisation des ouvrages programmés ne sont pas transférés à la commune. Un effort d'assainissement se fait dans la commune. En effet, la mairie a signé avec l'ONG SIA N ' SON un contrat de collecte des ordures ménagères dans la commune.

Cependant, en dépit de l'existence d'ONG pour assainir la commune et de vastes terres dont elle dispose, la mairie ne possède pas de sites ni pour les points de regroupements ni pour la décharge finale des ordures. La mairie est confrontée à d'énormes difficultés en matière de gestion des eaux usées. En effet, elle ne dispose pas de réseau d'assainissement pour recueillir les eaux usées. Dans le but d'assurer le traitement des eaux usées, dans le domaine de la protection des ressources en eau, on note une protection partielle du champ de captage de la SONEB, car celle-ci ne respecte pas les normes : protection immédiate, rapprochée et éloignée.

3- 5- Facteurs externes de la gouvernance locale de l'eau

La gouvernance locale des ressources en eau de la commune de Tchaourou présente des opportunités et des menaces.

3- 5- 1- Opportunités de la gouvernance locale de l'eau

La commune de Tchaourou bénéficie de nombreux atouts pour mieux gérer les ressources en eau dont elle dispose. Les recherches effectuées dans la commune ont montré qu'un effort a été fait en matière de réalisation des ouvrages hydrauliques. Ceci se justifie par le taux de desserte qui est d'environ 62%. Les populations de Tchaourou s'intéressent aux difficultés qu'elles rencontrent dans la gouvernance des ressources en eau. Une fois que les ouvrages sont en panne, le comité de gestion d'eau avise la mairie, qui à son tour fait appel aux artisans réparateurs pour la réalisation ou la rénovation de l'ouvrage. D'après le chef du service technique de la mairie de Tchaourou. Dans la mesure où la mairie travaille pour la population, elle se sent de plus en plus

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concernée par ses actions et la soutient» car, aujourd'hui et jamais, la gouvernance de l'eau concerne aussi bien les autorités que la population à la base.

3- 5- 2- Menaces de la gouvernance locale de l'eau

De nombreux dangers environnementaux menacent les ressources en eau de la commune de Tchaourou. Plusieurs facteurs agissent sur ces ressources. Entre autres, la dégradation des ressources en eau, la pollution et l'ensablement des cours d'eau. On note une mauvaise gestion des ouvrages hydrauliques, une grande distance qui sépare le site d'approvisionnement et la population. À tout ceci s'ajoute le coût élevé de l'eau, la pauvreté et les problèmes d'assainissement.

Le choix des fermiers et des délégataires est parfois contesté par les populations, ceci est dû à la politisation dans la désignation de ces derniers. On assiste aussi au non-respect des clauses contractuelles par les maîtres d'ouvrages. La méconnaissance des ressources d'eau disponible dans la commune par les autorités locales, le manque d'investissements, l'absence d'assistance technique et financière aux prestataires sont liés à l'accès difficile des populations aux infrastructures de fourniture en eau potable et d'assainissement.

La non-implication réelle du secteur privé dans les aspects liés à la gouvernance de l'eau constitue un handicap pour le développement de la commune. Ceci s'explique par le fait que la prise de conscience et la volonté politique pour promouvoir la gestion rationnelle, équitable et acceptée des ressources en eau sont nouvelles.

En résumé, le diagnostic territorial de la gouvernance locale des ressources en eau dans la commune de Tchaourou peut se résumer en deux facteurs: les facteurs internes et les facteurs externes. Le tableau xxx illustre le modèle de présentation des facteurs internes et externes de la gouvernance des ressources en eau dans la commune de Tchaourou.

Tableau II: Modèle de présentation des facteurs internes et externes

Facteurs internes	
Forces	**Faiblesses**
- Les conditions naturelles favorables à la disponibilité de l'eau dans la Commune de Tchaourou - Existence de volontés humaines pour la gestion de l'eau dans la Commune de Tchaourou	- Les conditions défavorables à la disponibilité de l'eau dans la Commune de Tchaourou - Peu de main d'œuvre qualifiée pour la gestion de l'eau dans la Commune de Tchaourou
Facteurs externes	
Opportunités	**Menaces**
- Les avantages liés à la disponibilité en eau dans la Commune de Tchaourou - Avantages liés a la gestions de l'eau dans la Commune de Tchaourou	Les inconvénients de la mauvaise gestion et répartition des ouvrages dans la Commune de Tchaourou Les inconvénients de la non implication des populations à la base dans la Commune de Tchaourou

Source : Traitement des données

4- DISCUSSION

Le diagnostic de la gouvernance locale de l'eau montre que le secteur de l'eau est confronté à plusieurs problèmes dont la faible couverture en infrastructures d'eau potable, à la non-effectivité de la maîtrise d'ouvrage communale en matière d'eau et à la gestion peu efficace des ouvrages d'eau potables existants. S'agissant de la gouvernance locale des ressources en eau dans la commune de Tchaourou, il se dégage que tous les acteurs (Etat, commune, secteur privé et population à la base) sont impliqués dans la gouvernance de l'eau. Mais il est noté une faible participation des populations à la gestion de l'eau. Cette ne facilite la pérennité des services d'eau. En effet Lise Breuil (2005) lors d'une réflexion sur les modèles de gouvernance pour la gestion des services d'eau dans les PED, « la participation considérée comme une fin en soi vise à augmenter la transparence et la recevabilité (accountability) des dirigeants (…), la participation considérée comme un moyen vise à améliorer l'efficacité d'un service ou tout simplement à le rendre viable et pérenne ». Et pour aller loin, Sylvy Jaglin (2005a) estime que la participation est présentée comme « un élément indispensable à la recomposition de l'action collective en ville, elle permettrait de renforcer l'efficacité des investissements et de la gestion du service d'une part, de promouvoir la démocratisation et l'équité des choix collectifs d'autre part ». La participation est synonyme de coproduction du service et l'implication des communautés est un moyen d'étendre le service.

Mais **Kpohonsito (2007)**, dans ses travaux sur la problématique de l'approvisionnement en eau potable dans la commune de Bopa estime que le véritable problème de l'eau à Bopa réside dans le fait que les communautés ne se sont pas véritablement approprié la gestion des points d'eau mis à leur disposition. Il note aussi, que la mauvaise gestion des points d'eau est liée aux modes de gestion utilisés par la commune. **Yelouassi, 2011**, identifie parmi les acteurs fondamentaux de la gestion des ressources

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en eaux, deux acteurs fondamentaux dans la commune d'Athiémé : la Mairie et le Fermier. La Mairie recrute le fermier pour assurer la distribution par vente de l'eau des châteaux. L'auteur trouve que les activités du fermier ne sont pas couronnées de réussites et sont donc jonchées de difficultés récurrentes qui ne facilitent pas la bonne gestion des équipements hydrauliques. Aussi pour des solutions idoines, l'auteur prévoit un dialogue entre les responsables municipaux et les fermiers pour une meilleure gestion.

Pour régler ce problème, **Adomou (2008)**, explique qu'il serait plus judicieux de concrétiser d'abord la maîtrise d'ouvrage hydraulique communale. Ceci permettra pour chaque point d'eau ,la signature avec les gestionnaires actuels des cahiers de charges stipulant clairement leurs droits et obligations et la prise de mesures limitant le développement des surcoûts de gestion avant d'envisager la gestion professionnalisée qui consister à recruter des gestionnaires qualifiés. De toute façon, la professionnalisation du service d'approvisionnement en eau doit être entendue comme un processus et non une panacée imposée une fois pour toutes dans la précipitation.

CONCLUSION

La gestion des ressources en eau est un domaine complexe à maîtriser en raison des multiplications des usages, responsabilités éclatées entre acteurs publics et privés, superposition de textes réglementaires sectoriels et parfois contradictoires entre eux, opposition des systèmes de représentations. La gouvernance locale des ressources en eau est confrontée à de nombreux défis, à cause entre autres de la mauvaise gestion des ressources en eau de surface, qui se raréfient. L'insuffisance de communications entre les usagers a conduit parfois à des tensions perceptibles.

Ce diagnostic permet de proposer une méthodologie afin d'appréhender la gestion de l'eau de manière holistique

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SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 7 | Issue: 12 | December 2022 - Peer Reviewed Journal

RESILIENCE AFTER LOSS: REFLECTIONS OF INDIVIDUALS LOSING LOVED ONES IN THEIR FAMILIES

Faheema Aziz[1], Humera Shafi[2]
[1]*Research Scholar, Department of Psychology, University of Kashmir*
[2]*Associate Professor, Department of Psychology, University of Kashmir*

ABSTRACT

The loss of a loved one in the family has the potential to bring loss of significant roles and responsibilities and disrupt the normal family functioning processes. The process of adaptation demands re-organization and re-calibration of roles and responsibilities and regaining the coherence of reality in life. Such processes of rebuilding and moving forward in lives are referred to as Resilience. The relational position and the familial context have an important influence on the experiences of adaptation among bereaved individuals. It is therefore important to understand the experience of reconstruction and rebuilding of individuals belonging to different relational positions in their families.

The paradigm of constructivism was followed to answer the research questions of the present study. In-depth interviews were conducted with eleven bereaved individuals belonging to different relational positions in their families. The age of participants was in the range of 19 to 50 years with a mean of M= 35.6 years. Five participants had experienced the death of a spouse, four had experienced the death of a parent and two had experienced the death of a child in their families. The time since the death of a family member was in the range of 2 to 5 years with a mean of M= 3.1 years. The data from participants was analysed using thematic analysis(Clarke & Braun, 2013).

The experiences of participants were portrayed in the following themes: "changed Life Perspective", "Reconstructed Identity", and "Increased Commitment Towards the Family".

The findings identify the positive aspects of the experience of bereaved individuals belonging to different relational positions in their families. Such findings have implications for grief counselors and therapists in helping the bereaved individuals build upon their positive aspects and focus on what is working in their lives as they move forward in reconstructing their lives.

KEYWORDS: *Resilience, family, bereavement, constructivism, themes, thematic analysis*

BACKGROUND

Every significant relationship in family is integral to the being of every other individual in the whole unit. A family is a social-emotional unit or amalgam and the death of an individual in such a unit tends to bring about changes in the structural and functional dimensions of the whole unit(Bowen, 2018).

The concept 'family' has been defined in many ways. The definitions of the family include; a group of people related by blood or marriage (Oxford Dictionary, 2017); a group consisting of parents and their children living together as a unit (Oxford Dictionary, 2017); the basic unit in society traditionally consisting of two parents rearing their children (Merriam-Webster Dictionary, 2017). For the present study family means a unit of two or more individuals who, through the context of their relationships, support one another in various roles and responsibilities (Wright & Leahey, 2014).

The amount of disruptions that death of a family member brings in the whole unit depends upon centrality of relationship with deceased in the whole unit. In a family context, grief brings along the crisis of identity and attachment for the interdependent members (Gilbert, 1996). It shatters the assumptions of reality and disrupts the coherence in the daily lives of individuals related to the deceased (Janoff-Bulman, 1989). It disrupts family stability in the interrelated domains of emotions, interactions, social roles, and meanings(Walsh & McGoldrick, 2013). Therefore, death in the family is a stressor that brings tension or pressure on the status quo of the whole unit.

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The process of adaptation involves reconstructing and re-building the disrupted lives. It demands revising shattered assumptions and building coherence in one's life (Attig, 2001). Maintaining family as a functioning entity demands re-organization and re-calibration of roles and responsibilities along with the resolution of bereavement in the family. The processes of reconstruction and rebuilding of disrupted lives involves the utilization of individual and shared resources in the family and in socio-cultural context (McCubbin & McCubbin, 1989). Such processes of adaptation have mostly been explained by the stress adaptation researchers.

In the recent years, the focus of stress adaptation researchers has moved toward resilience. They began to identify the strengths and resources that facilitate positive adaptation. The resilience orientation rebalances the problem focus to how individuals are challenged in the face of crisis and are operating well (Walsh, 2016).

The construct resilience has been defined and refined in a number of ways. The process of adapting well in the face of adversity, tragedy, threats, or even significant sources of stress is most generally referred to as resilience (Masten, 2014). The social-ecological context is considered to have an important bearing on the resilience of an individual. The process of resilience takes place at the levels of the individual, the family and the community(Masten, 2018). Therefore, when exploring the good outcomes or positive adaptation to loss in families, it is important to have an understanding of relational, familial and cultural contexts that has its impact on manifestation in the lived experiences (Osterweis et al., 1984; Shapiro, 1996).

The evidences of coping and adaptation in bereavement have been observed in the previous studies on bereaved individuals. Many studies feature growth and positive change out of adversity.

Apelian & Nesteruk (2017), observed coping strategies among bereaved young adults in dealing with the stressors that piled up in their lives. Positive adaptation processes were linked to receiving social and emotional support from friends, family and other relatives. Working hard in school, using friends as distraction and isolating when needed were some of the coping strategies described by the participants. The participants described their resilience and personal growth in terms of changed life perspective and becoming stronger than they were before bereavement.

Fikry (2019) observed the stressors and positive experiences on two young adults who had experienced parental death. Becoming more independent, responsible and sensitive to the future conditions of family were some of the positive experiences described by the participants. The perspective of their life changed and they saw their life in a more mature and rational manner. They described that by relying on their own abilities, they became more steadfast and daring to face the challenges of life.

Dabla (2010), in an attempt to identify social and financial factors that help and hinder the daily life among women after spousal bereavement in Kashmir by, it was observed that they faced the major challenge in terms of parenting their children irrespective of their economic status. They coped in their lives by giving priority to the education of their children and striving hard to educate them. The major support for widows were observed to be parental families, ex-husband's families, other relatives and individuals, government organizations and NGO's.

In an identification of the resilient qualities in families, Greeff et al (2011) conducted a study on 89 families in Belgium who had lost a child to death. The resources and coping strategies that helped them through difficult period was observed. The results indicate that family strengths in general, and commitment to the family helped the families' adaptation after the loss. Viewing crisis as a challenge by the family also aids in adaptation. In response to the open-ended question, 72% of the participants indicated commitment to family as an important recovery factor, and 10% indicated the importance of fostering hope and a positive attitude in adaptation to the loss.

Cadell and Sullivan (2006), in a study on bereaved parents observed the positive aspects of bereavement experience in three main domains: finding new possibilities like giving or receiving service to others; increased appreciation and positive changes in relationship with friends and family, renewed relationship with the deceased; achieving personal growth, appreciating life in new ways and experiencing a change in the philosophy of life. Bereavement was viewed as a chance to learn more about themselves, their views of life and their relationship with religion and spirituality.

It is evident in the literature that most people adapt to bereavement and move towards positive change and growth after experiencing loss and adversities in their lives.

CURRENT STUDY

There is a dearth of literature exploring the experiences of coping among bereaved individuals from different relational perspectives in their families. The aim of the current study is to address such a gap in the literature and gain an understanding of the adaptation experiences of bereaved individuals belonging to different relational contexts in their families. The purpose of the present study is to gain an insight into the stories of adaptation with loss in their lives so that pertinent help can be provided to such individuals. The study needs to answer the following research questions: What are the positive changes experienced by bereaved

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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individuals as they adapt to the difficulties and challenges in their lives? How do such experiences differ from different relational position in their families?

METHODOLOGY

The research questions of the present study are answered within the paradigm of constructivism. Constructivism is a post-modern philosophy which argues that all experiences and concepts are constructed through language situated in a particular context. It is the language which creates what we envisage as 'real' (Lincoln & Guba, 2016). Phenomenology was used as a method of enquiry to elicit and interpret the experiences of individual participants (Creswell & Poth, 2016). In-depth interviews were used so as to gain an insightful understanding of the participants' experiences.

The interviews were audio-taped and then transcribed. Field notes and observations were also taken. Huge amount of time was taken to build rapport with participants while taking consent from them and during interview sessions. Confidentiality was maintained in handling information from participants. The names of the participants mentioned in the study are pseudonyms.

Eleven participants were interviewed for this study. The participants were in the age range of 19 to 50 years with mean of M= 35.6 years. The time since the death of family member was in the range of 2 to 5 years with a mean of M= 3.1 years. Five participants had experienced the death of a spouse, four had experienced the death of a parent and two had experienced the death of a child in their families.

The technique of thematic analysis (Clarke & Braun, 2013) was used to identify themes in the data. The steps of analysis included: Familarization with the data involving transcribing, reading and noting down main ideas in the transcript; Generating codes and collecting data relevant to each code; Generating themes after clustering codes with similar meanings; Reviewing themes and finally Producing the report.

FINDINGS

Following themes encompass the adaptation processes of individuals after facing disruption in their lives; "*changed life perspective*", "*Reconstructed Identity"*, and "*Increased Commitment towards the Family*".

Changed life perspective

The participants described that they view their lives quite differently than they used to before experiencing loss in their lives. The participants who had lost their spouses and had to struggle with the stressors of parenting and managing daily activities without the help of spouse increased their understanding of the harsh face of life. The participants who had lost their parents described that feelings of deprivation gave them humbled and patient attitude towards their life. The participants who had lost child described that experiencing such a tragedy in their lives increased their understanding of the temporality of life.

The woman who was parenting her children and working for her family expressed her changed perspective towards life which was seen in positive light by her.

> *After the death of my husband, I started coming out of the confines of my home and working for the sustenance of my family. I met many people and I found that there are many others who are struggling with the same kind of situation. It pacified my heart that I was not alone. My way of looking at life changed. A woman can achieve anything when she does not give up at the hands of situations.*
>
> *(Rafiqa, 42 years)*

Another participant spoke similarly about the changed her perspective towards life.

> *After the death of my husband, I was an easy target for those who wanted to take an advantage of my weakness. I feared losing my house and husband's shop. Facing such people in life changed my way of looking at life. One always has to be conscious of the people who appear in the guise of being friends to you. (Shabnum, 40 years)*

Another participant spoke similarly

> *Facing such a tragedy in life was very difficult for me. I never had dealt with any such kind of a big misfortune in my life. The earlier days were very difficult for me but it gave me the realization that life can be very harsh to a person. One has to remain prepared for every untold happening in one's life.*
>
> *(Saleema, 43 years)*

The participant who had lost her father at an early age described that dealing with all the restrictions and problems humbled her attitude towards the life.

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After the death of my father, I faced many restrictions and dealt with so many difficulties without the guidance of my father. The feeling of being deprived of something significant always remains in my life. It makes you realize that everything cannot be achieved in life and makes you look at life with a humble attitude.

(Sadia,22 years)

Another participant spoke in a similar way.

If God had provided me with everything in life, it would have been impossible for me to remember Him. The tragedy changed my way of looking at life. It made me more sensitive towards other people's pain.

(Hina, 19 years)

The participant who had lost her daughter expressed that the loss increased her understanding of life.

My daughter was quite young to die. Seeing young people leave their lives before you makes you realize that this material life is quite temporary. Everyone has to leave one day or the other. One should always be a good person. This is what makes this temporary life so beautiful.

(Zamrooda, 48 years)

Reconstructed Identity

The participants described change in the perspective of how they view themselves as individuals after bereavement. The women who had lost their spouses and were parenting their children alone in the family expressed that they view themselves as strong, autonomous and mature beings as they dealt with many difficulties in their lives on their own. The participants who had lost their parents described that managing many activities in their without the help of parents turned them into mature and responsible individuals. The participants who had lost a child in the family described that they gained virtues in their personality after experiencing such an unanticipated loss in their lives.

The participant who had lost her spouse described gaining autonomy and maturity in her life.

After losing my husband, many people tried to command their power over my life… But I never lost my wits. I gained control over my life, took stand for my children and decided to commit my life for them. Parenting my children alone and doing all the tasks which a man is supposed to do for his family made me learn a lot… I feel like the experience that my life gave me is like gaining the wisdom that even an old person would not have.

(Rafiqa, 42 years)

Another participant spoke about the strengths she gained in her life.

I achieved the tasks that my husband could never achieve in his life. I am building a new house for my family and looking after all things like a man. I manage my home and also work for my family. I feel that all these experiences made me stronger than a man could ever be.

(Shabnum, 40 years)

Another participant spoke in a similar manner.

After the death of my husband, I learned the skill of managing many tasks like buying the things for home, dealing with vendors outside and managing budget for the family. I feel more responsible for managing the things which I less cared about when my husband was living with us.

(Saleema, 43 years)

The participant who had lost her mother described the maturity she gained after managing things without the help of her mother.

My mother managed everything for me. She managed my savings and always took my side whenever I made any mischief. Now, there is no one to do such things for me… it makes me think deeply about the life. Taking every step in life in a careful manner has turned me into a more mature individual.

(Aneesa, 20 years)

Another participant spoke similarly

Nobody can understand how difficult it was for me to make decisions after he left my life. Carrying along my studies and managing responsibilities of my home… I feel that I became a more responsible individual as I have to mange more responsibilities than I used to when my father was there for us.

(Adil, 23 years)

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The participant who had lost her daughter spoke about the virtues she gained after the loss in her life.

It made me realize that one should always work for the better hereafter. Since her death, I always try to be good to people around me. I always try to do whatever good I can do in my life.

(Haseena, 49 years)

Commitment towards the family

The participants described that their commitment and concern for other members in the family has increased after experiencing loss in their lives. The participants who had lost their spouses described their increased concern towards their children and hopes in their future. The participants who had lost parents in their lives described the feelings of increased responsibility towards their surviving parent and siblings in the family. The participants who had lost a child in their lives described that living and making efforts for the happiness of other members in family provide them with hopes for the survival.

The participant who had lost her spouse described the commitment towards her children and described her family as the hope of her survival.

If my children are happy in their lives, it will be the satisfaction for me that I have achieved the mission of my life. They lost their father but I committed my whole life to them and always make sure that they don't feel any deprivation in their life. My children give me the purpose of my life.

(Rafiqa, 42 years)

Another participant spoke about the commitment towards her children.

My children are the sole motive that help me progress in my life. I would have managed on the little income but my children have a vast future ahead of them.. all my struggles in life are for them till they become mature enough to earn for themselves.

(Shabnum, 40 years)

Another participant spoke similarly.

Their father had many dreams for them. Fulfilling all these dreams in life gives me the reason to live. Getting my daughters married and watching my son successful in life… it makes my life meaningful.

(Saleema, 43 years)

The participant who had lost her father spoke about the concern and feelings of increased responsibility towards her mother.

After the death of our father, I look upon my mother as the blessing of God that still remains in our lives. She is quite selfless in managing all our responsibilities. My concern for her increases when she does not feel well or is late from office… she is the only shelter of our home after father left us.

(Sadia,22 years)

Another participant spoke about the increased commitment towards his family after the death of his father.

The difficulties we faced after the death of our father in the family brought us more close to each other. Giving hopes and motivating each other helped us to get back into our after facing the hardships during the father's illness and after his death.

(Adil, 23 years)

The participant who had lost her daughter described the hope that the family provides her.

After I lost my daughter, it was very difficult for me to get back into my life again. But the love and affection I received from the other family members helped me restart my life once again. I want to be for them always so that their happiness in life never decreases. His (son's) family and happiness gives me a reason to live.

(Zamrooda, 48 years)

DISCUSSION

Majority of the participants described that they had to deal with stressors that are not ordinary for the phases or stages of life they are in. The participants who had lost their spouses and were parenting their children alone described dealing with stressors that are non-normative for the women at such a phase in their lives. The participants who were parentally bereaved described they feel the deprivation that is not ordinary for the individuals in the stage of life they are in. The participants who had lost their children described facing such a loss as something they never had apprehended in their lives. It is evident in their expressions that facing loss had significant consequences in their lives that had a life altering impact on them. It led to a change in their perspective and attitude towards their lives and such a change was mostly framed in positive light by the participants. Such findings are in line with observations of changed perspective towards life among bereaved individuals in the previous studies (Apelian & Nesteruk, 2017; Cadell & Sullivan, 2006; Lowe & McClement, 2011).

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The participants described that they view themselves as changed beings and mature individuals than they were before experiencing loss in their lives. They expressed that dealing with unexpected or non-normative difficulties in their lives turned them into mature individuals. It is evident in the expression of participants who lost their spouses and were parenting their children alone. Fulfilling all the activities of life that were previously shared with their spouses made them attain a sense of autonomy and responsibility in their lives. The participants who had experienced parental bereavement described that they attained a sense of responsibility and maturity as they went through difficult periods in their lives. The participants who had lost a child in their life described the increased spiritual and religious values in their personality. Such findings are also indicative of the positive dimensions of bereavement process. These observations have already been made in the previous studies on bereaved individuals (Apelian & Nesteruk, 2017; Cadell & Sullivan, 2006; Fikry, 2019; Lowe & McClement, 2011; Tedeschi & Calhoun, 2004).

The participants described the increased concern and feeling of responsibility towards their families. The expressions reflect the commitment and increased concern that participants have for their families. The participants who were single parents to their children expressed increased concern towards their children. They viewed their children as future of their lives and the basic reason that gives meaning to their lives. The participants who had lost one of their parents described the feeling of responsibility towards their family. it is also evident in the expression of the participants who had lost a child in their life that their family gives them the hope and reason to move forward in their lives. Such findings reflect the values of collectivism inherent in our culture. The feelings of responsibility towards others in life give a reason to move forward after experiencing a set-back in their lives. Such findings are in line with the previous studies on bereaved individuals (Apelian & Nesteruk, 2017; Dabla, 2010; Greeff et al., 2011; Greeff & Human, 2004).

IMPLICATIONS, LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

The findings of the present study give an understanding of the complexities of the bereavement experience. Understanding the experiences of bereaved individuals while they move towards finding meaning in their lives and engage in the process of reconstructing and rebuilding their lives helps counselors to move beyond the victimhood paradigm of bereavement and provide pertinent help to such individuals. The criteria for adaptive function may vary across different contexts but it is imperative to understand what goals are important to people and what they are already doing to achieve these goals. From that sense, resilience is not just about "functioning well" or "better than expected", it is about "making sense" of the moral aspects of life (Panter-Brick & Eggerman, 2012).

The findings identify the positive aspects of experience of bereaved individuals. Such findings have implications for grief counselors and therapists in helping the bereaved individuals build upon their positive aspects and focus on what is working in their lives as they move forward in reconstructing their lives.

The findings of the present study are limited to those who took part in the study and one needs caution in making generalization about such findings. In order to have a broader and understanding of such positive experiences among individuals in different relational connections to the deceased, a study on a large scale needs to be conducted taking into consideration the large sample of the population.

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EPRA International Journal of Research and Development (IJRD)
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ISSUES OF STUDYING LINGUODIDACTIC AND LINGUOPSYCHOLOGICAL ASPECTS OF PROFESSIONAL LEXICAL COMPETENCE OF STUDENTS IN FOREIGN LANGUAGE LESSONS OF A NON-PHILOLOGICAL UNIVERSITY

Juraeva Gulnoza Nasirullaevna
Lecturer at the Department of Foreign Languages,Tashkent Institute of Chemical Technology. Uzbekistan.

ANNOTATION
This article explores the linguo-didactic and linguo-psychological aspects of the professional lexical competence of students in teaching foreign languages in non-philological universities.
KEYWORDS: *foreign languages, skills and abilities, lexical volume, aspects, language competence, speech experience, linguistic knowledge.*

ВОПРОСЫ ИЗУЧЕНИЯ ЛИНГВОДИДАКТИЧЕСКИХ И ЛИНГВОПСИХОЛОГИЧЕСКИХ АСПЕКТОВ ПРОФЕССИОНАЛЬНОЙ ЛЕКСИЧЕСКОЙ КОМПЕТЕНЦИИ СТУДЕНТОВ НА ЗАНЯТИЯХ ПО ИНОСТРАННОМУ ЯЗЫКУ НЕФИЛОЛОГИЧЕСКОГО ВУЗА

Жураева Гулноза Насируллаевна
Преподаватель кафедры «Иностранных языков»
Ташкентского Химико-технологического
института. Узбекистан.

Аннотация
В данной статье исследованы лингводидактические и лингвопсихологические аспекты профессиональной лексической компетенции студентов при обучении иностранным языкам в нефилологических вузах.
Ключевые слова: *иностранные языки,навыки и умения,лексический объём,аспекты, языковая компетенция, речевой опыт, лингвистические знания.*

Ориентирование будущих инженеров на профессиональное общение на иностранном языке является основной целью обучения иностранным языкам в вузах, что является, с одной стороны, социально важной, а с

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другой стороны, методологически оправданной задачей. Опыт показывает, что студенты проявляют больший интерес к иностранному языку только в том случае, если они чувствуют, что этот предмет будет полезен на практике, то есть приобретенные знания, умения и навыки будут востребованы в будущем.

Сегодня студенты технических специальностей осознали важность навыков чтения, письма и общения на иностранном языке, ведь в современном мире овладение профессиональным иностранным языком тесно связано с карьерным ростом. Однако можно отметить, что ситуация осложняется недостаточным обеспечением аудиторных часов по иностранному языку и учебно-методической разработки для организации самостоятельной внеаудиторной работы в системе профессиональной подготовки специалистов технических вузов.

Известно, что Национальная программа подготовки кадров предусматривает, что выпускники нефилологических вузов должны уметь читать и понимать содержание иностранной литературы, связанной с их профессией, как минимум на одном-двух иностранных языках, уметь применять ее на практике , что повышает конкурентоспособность кадров не только в нашей республике, но и в мировом масштабе. А это является одним из основных показателей. Для этого студенты должны овладеть минимальным лексическим объемом, необходимым для использования в устной и письменной коммуникации, а также уметь находить и читать информацию, необходимую для их профессиональной направленности.

Сегодня в нефилологических вузах возникает необходимость согласования преподавания иностранных языков с профессиональными направлениями студентов, иными словами, разработка программ профессионального иностранного языка (ESP) с целью выравнивания их знание иностранного языка, умения, навыки, необходимо пройти курс «Общий иностранный язык (...)», направленный на развитие простых коммуникативных навыков.

На самом деле уровень общеязыковой компетенции более половины студентов первого уровня нефилологических вузов значительно ниже требуемого уровня, и это создает определенные препятствия в развитии профессиональной коммуникативной компетенции студентов при занятия иностранными языками по нефилологическим направлениям. То есть в ряде случаев возникает необходимость сначала сформировать у студентов обыденную коммуникативную компетенцию, а затем развивать у них коммуникативную компетенцию для профессионального общения.

Профессиональная коммуникативная компетентность – это способность обучающегося вести межкультурную коммуникацию на иностранном языке в различных профессиональных ситуациях.

В документах Европейского совета по межкультурному сотрудничеству языковая компетенция определяется как способность выражать мысли на конкретном языке с использованием изученных лексических единиц и усвоенных нормативных правил. В некоторых исследованиях утверждается, что языковая компетенция недостаточна для практического речевого опыта, она состоит только из правил, перерабатываемых в речевом процессе [1,58].Г.В. Колшанский подчеркивает необходимость понимать это понятие в широком смысле. По его мнению, языковая компетенция — это способность каждого человека познавать законы материального существования на основе какой-либо языковой системы с помощью общего аппарата логического мышления, и ни лексика, ни фонетика, ни грамматика не могут превратить язык в средство общения. отдельно [2, 12]

Н. В. Кормилина, Н. Ю. Шугаева рассматривают языковую компетенцию как средство доступа к коммуникативной компетенции. По их мнению, языковая компетенция – это знание правил действия языковых средств и фоновых механизмов, связанных с речевой деятельностью, с конкретными коммуникативными возможностями и функциями в общении с другими языками [3,17]

Лингвистическая компетенция, по И. Л. Биму, состоит в «овладении языковыми средствами, охватывающими процесс от создания текста до его понимания» [4]. Маруневич О. В считает, что языковая

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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компетенция - это единицы фонетического, лексического, словообразовательного, морфологического и синтаксического уровней языка, которые «позволяют строить бесчисленные коммуникативные единицы определенного содержания» [5, 55). По мнению Краснощекова Г.А., «языковая компетенция - это языковая способность, объединяющая такие компоненты, как языковое знание, языковые навыки и правила и алгоритмы, вытекающие из лингвистических наблюдений и обобщений» [6,.100].

Из мнений зарубежных ученых можно сделать вывод, что лингвистическая или языковая компетенция – это «знания языкового характера, понятные или не до конца понятые, и с помощью этих знаний навыки, доведенные до уровня автоматизации, направленные на осуществление познавательных действий и процессов, направленных на смысловое составление и преобразование дискурсивных кодов»[4]. Лингвистическая компетенция, с одной стороны, является основой коммуникативной компетенции, а с другой - лингвистическим компонентом, включающим языковые знания, лексико-грамматические фонетические навыки и другие описательные стороны языковой системы. Эта компетенция является составной частью иноязычной коммуникативной компетенции и отражает «лингвистические знания, охватывающие лексические, грамматические, семантические, фонологические, орфографические и орфоэпические аспекты языковой системы» [6, 15].

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SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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ACTIVATION OF COGNITIVE ACTIVITY OF STUDENTS OF THE INSTITUTE OF CHEMICAL TECHNOLOGY IN GERMAN LESSONS WITH THE HELP OF NEW INFORMATION TECHNOLOGIES

Davlatov Keldiyor Davlatovich
Head of the Department of Foreign Languages,Tashkent Chemical-Technological Institute.Uzbekistan

ANNOTATION
The advantages of using computer programs over traditional teaching methods, the functionality of electronic educational resources, the features of the use of information and communication technologies in German lessons in technological universities are considered.
KEYWORDS: *information technology, computer learning, knowledge testing, lesson, electronic text.*

AKTIVIERUNG DER KOGNITIVEN AKTIVITÄT VON SCHÜLERN DES INSTITUTS FÜR CHEMISCHE TECHNOLOGIE IM DEUTSCHUNTERRICHT MIT HILFE NEUER INFORMATIONSTECHNOLOGIEN

Davlatov Keldiyor Davlatovich
Leiter des Fachbereichs Fremdsprachen
Taschkent chemisch-technologische Institut.Usbekistan

Anmerkung
Berücksichtigt werden die Vorteile des Einsatzes von Computerprogrammen gegenüber traditionellen Unterrichtsmethoden, die Funktionalität elektronischer Unterrichtsmaterialien, die Besonderheiten des Einsatzes von Informations- und Kommunikationstechnologien im Deutschunterricht an technischen Hochschulen.

Schlüsselwörter: *Informationstechnologie, Computerlernen, Wissenstest, Unterricht, elektronischer Text.*

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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АКТИВИЗАЦИЯ ПОЗНАВАТЕЛЬНОЙ ДЕЯТЕЛЬНОСТИ СТУДЕНТОВ ХИМИКО- ТЕХНОЛОГИЧЕСКОГО ИНСТИТУТА НА УРОКАХ НЕМЕЦКОГО ЯЗЫКА С ПОМОЩЬЮ НОВЫХ ИНФОРМАЦИОННЫХ ТЕХНОЛОГИЙ

Давлатов Келдиёр Давлатович
Заведующий кафедрой Иностранных языков
Ташкентского химико-технологического
института.Узбекистан.

Аннотация

Рассмотрены преимущества использования компьютерных программ над традиционными методами обучения, функциональные возможности электронных образовательных ресурсов, особенности применения информационно-коммуникационных технологий на уроках немецкого языка в в технологических вузов.

Ключевые слова*: информационные технологии, компьютерное обучение, проверка знаний, урок, электронный текст.*

Die Moderne stellt immer höhere Anforderungen an den Unterricht der russischen Sprache am Staatlichen Konservatorium Usbekistans. Die Menge an Informationen wächst, und oft sind die traditionellen Methoden ihrer Übermittlung, Speicherung und Verarbeitung ineffizient. Es werden Wege entwickelt, um die Effektivität der allgemeinen Bildung zu verbessern, und große Mittel werden in die Entwicklung und Implementierung neuer Informationstechnologien investiert. Der Einsatz von Informations- und Kommunikationstechnologien im Russischunterricht am Konservatorium ermöglicht es vor allem, die Aufgabe zu aktivieren, die Fähigkeiten der unabhängigen kognitiven und praktischen Aktivitäten der Schüler zu bilden [1, 24].

Durchführung psychologischer und pädagogischer Forschung, darunter die Arbeiten von Ya.A. Vagramenko, A.A. Kuznetsova, E.I. Mashbits, E.S. Polat, V.V. Rubtsova, B.K. Tikhomirov, sprechen Sie über das große Potenzial der Verwendung von Lehrmethoden, die auf der Nutzung von Informations- und Kommunikationstechnologien basieren. [1,67-68]. Die Anwendung dieser Technik gewährleistet die Individualisierung des Lernprozesses, die Anpassung an die Fähigkeiten, Interessen und Fähigkeiten der Auszubildenden, entwickelt ihre kreative Aktivität und Unabhängigkeit, öffnet den Zugang zu neuen Wissens- und Informationsquellen. Computerbasierte Trainingsprogramme haben viele Vorteile gegenüber herkömmlichen Lehrmethoden. Sie ermöglichen es Ihnen, verschiedene Arten von Sprachaktivitäten zu entwickeln und in verschiedenen Kombinationen einzusetzen, helfen, sprachliche Phänomene zu verstehen, sprachliche Fähigkeiten zu bilden, kommunikative Situationen zu schaffen, Sprache und Sprechhandlungen zu automatisieren.

Computertraining hat ein enormes Motivationspotential. In der Tat ermöglicht die Verwendung von Multimedia, jeden Schüler zu interessieren, den Unterricht mit einer Vielzahl von Materialien zu sättigen, erweitert die Möglichkeiten, verschiedene Formen der Einflussnahme und Arbeit zu variieren, und macht den Unterricht heller und reicher. Eine besondere Rolle kommt natürlich dem Bildmaterial zu - Fotos, Poster, Videoclips, Animationen etc. Für die effektive Einführung dieser Art von Bildung in das System der Fachoberschulbildung müssen jedoch eine Reihe pädagogischer und psychologischer Bedingungen beachtet werden.

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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Derzeit ändert sich das Prinzip der Anzeige von Informationen, die in Form von Text präsentiert werden. Das lineare Prinzip der Darstellung solcher Informationen weicht dem „Clip-Prinzip“, einer fragmentarischen, bildlichen Darstellung von Wissen, Informationen etc. Die Bildschirm-Computer-Darstellung von Bildungsinformationen bildet eine besondere Art des Denkens [2,30]. Informations- und Kommunikationstechnologien ermöglichen es, schnell auf eine sich schnell verändernde Welt zu reagieren, was beim Erlernen der russischen Sprache, insbesondere des Wortschatzes, wichtig ist.

Betrachten Sie die Frage nach der Funktionalität von elektronischem Text. Zweifellos sind die Möglichkeiten eines solchen Textes größer als die Möglichkeiten eines auf Papier gespeicherten Textes. Nennen wir die Vorteile eines elektronischen Speichermediums:

— Möglichkeit der kompakten Speicherung einer großen Informationsmenge;

- schnelle Vervielfältigung und Verbreitung von Bildungsinformationen;

- Segmentierung des Textes und seine Korrektur;

— Nutzung des Textes durch mehrere unabhängige Nutzer;

- Ergänzungen des Textes durch andere semiotische Systeme wie Ton und Bild.

Ein informationstechnisch aufgebauter Unterricht ermöglicht es Ihnen, das Prinzip des differenzierten und individuellen Lernens umzusetzen.

Wie die Praxis zeigt, arbeiten auch Schüler, die sich im klassischen Unterricht unsicher fühlen oder Aufgaben nur ungern erledigen, gerne in einem Computer-Klassenzimmer mit. Die Rolle des Lehrers ist hier eher betreuend als kontrollierend, sodass Schüler und Lehrer nicht zwei entgegengesetzte Seiten sind, sondern zusammenarbeiten, um ein gemeinsames Ziel zu erreichen. Sie können auch die Grafikfunktionen Ihres Computers nutzen. Dies ist besonders wichtig beim Erlernen neuer Vokabeln, da Sie durch das Bild auf dem Monitor den Satz direkt mit der Handlung in Verbindung bringen können.

Computertechnologie kann auf drei Arten implementiert werden:

- "durchdringende" Technologie (Einsatz von Computerschulungen zu einzelnen Themen, Abschnitten, um einzelne didaktische Aufgaben zu lösen);

- die wichtigsten, definierenden und bedeutendsten Teile, die in dieser Technologie verwendet werden;

- Monotechnologie (wenn das gesamte Training, die gesamte Verwaltung des Bildungsprozesses, einschließlich aller Arten von Diagnostik und Überwachung, auf der Verwendung eines Computers basieren) [3, 21-22].

Der Einsatz von Multimedia im Aufbau eines modernen Unterrichts an einer Technischen Hochschule sollte methodisch fundiert und zielgerichtet erfolgen. Natürlich entscheidet jeder Lehrer selbst, ob es notwendig ist, mit dieser Unterrichtstechnologie zu arbeiten.

Aber hier können wir einige allgemeine Regeln hervorheben:

- Ein Computer wird dort eingesetzt, wo es möglich ist, Aktivitäten zu automatisieren und Zeit für die Verarbeitung von Ergebnissen zu sparen (Kontrolle, Testprogramme);

Der Computer wird für den Unterricht verwendet. Hier sprechen wir über den Einsatz verschiedener Trainingsprogramme, deren Auswahl sehr verantwortungsvoll angegangen werden muss. Nicht alle bis jetzt produzierten Softwareprodukte[4,76]ac haben gute Empfehlungen. Bewertungen von Bildungsressourcen und Bewertungen von Benutzern bestimmter Software werden ständig im Internet veröffentlicht. Der Lehrer entscheidet selbst, ob und welche Trainingsprogramme verwendet werden;

- Der Computer wird verwendet, um Unterrichtsmaterial zu demonstrieren.

Entsprechend der Zweckmäßigkeit werden Ansätze zur Organisation eines Multimedia-Unterrichts gebildet:

— die Verwendung eines Computers im Klassenzimmer. In der Regel wird es verwendet, um visuelles Material zu demonstrieren und gleichzeitig neues Material zu erklären und zu verstärken. In Kombination mit einem Computer wird eine Projektionsausrüstung sowie ein interaktives Whiteboard verwendet;

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- Arbeiten im Computerraum. Diese Form der Unterrichtsorganisation wird üblicherweise zur Kontrolle des Wissens von Schülern verwendet, wenn das Wissen einer großen Anzahl von Schülern in kurzer Zeit vom Lehrer kontrolliert wird. Die Verfügbarkeit der Ausrüstung ermöglicht es, solche Formen der Wissenskontrolle wie Tests (mit MS WORD-, Excel-, Power Point-Programmen), Echtzeit-Wissenstests (diese Form der Arbeit wird mit Kommunikationsprogrammen ICQ, Skype organisiert) effektiv anzuwenden. Es ist auch möglich, in einem Chat und in einem Schulungsforum zu arbeiten.

Nach Festlegung der Herangehensweise an die Unterrichtsorganisation ist es notwendig, die Ziele und Arbeitsformen mit der entsprechenden Unterrichtsphase in Beziehung zu setzen.

Im Deutschunterricht kann ein Computer in verschiedenen Phasen des Unterrichts und des gesamten Bildungsprozesses eingesetzt werden:

- in der Phase der Erklärung von neuem Material;
- Erstfixierung des Materials;
— Kontrolle und Überprüfung des Wissens.

Im Lernsystem führt der Computer die folgenden Funktionen aus:

- technisch und pädagogisch (Trainings- und Kontrollprogramme, Diagnose, Modellierung, Experte, interaktiv, Beratung, rechnerisch und logisch);
- Didaktik (Computer als Simulator, Tutor, Assistent, Gerät, das bestimmte Situationen simuliert);
- zeitnahe Aktualisierung von Bildungsinformationen, Beschaffung von Betriebsinformationen über die individuellen Merkmale der Schüler;
- Anpassungen, Kontrolle und Bewertung ihrer Aktivitäten, ihre Aktivierung und Stimulation.

Der Einsatz neuer Informationstechnologien in verschiedenen Unterrichtsstunden hat gegenüber dem Standard-Lehrsystem folgende Vorteile:

- Interesse, Motivation der Bildungstätigkeit steigen;
— ein differenzierter Ansatz wird umgesetzt;
- in der gleichen Zeit wird mehr Arbeit geleistet;
– der Prozess der Überwachung und Bewertung von Wissen wird erleichtert;
- Fähigkeiten der pädagogischen Tätigkeit entwickeln (Planung, Reflexion, Selbstkontrolle, gegenseitige Kontrolle).

Der traditionelle Unterricht als zentrale Organisationsform des Lernens hat sich sowohl im Kontext sich ändernder Ziele und Werte der Bildung, als auch im Kontext einer technologischen Revolution im Bereich der Lehrmittel, beim elektronischen didaktischen Unterricht, als adäquate Form herausgestellt (Multimedia-Lehrbücher, interaktive Trainingssimulatoren, elektronische Enzyklopädien usw.) begannen, mit einem gedruckten Lehrbuch zu konkurrieren. Mediatheken). Ein moderner Multimedia-Unterricht baut auf der gleichen Struktur auf wie ein traditioneller: Wissen aktualisieren, Neues erklären, festigen, kontrollieren. Es werden die gleichen Methoden verwendet: erklärend und illustrativ, reproduktiv, teilweise explorativ usw.

Daher sollten traditionelle Lerntechnologien durch neue informationsentwickelnde pädagogische Technologien ersetzt werden. Mit ihrer Hilfe sollen solche pädagogischen Situationen im Unterricht realisiert werden, in denen die Aktivitäten von Lehrern und Schülern auf der Nutzung moderner Informationstechnologien basieren und forschenden, heuristischen Charakter haben. Für die erfolgreiche Implementierung dieser Technologien muss der Lehrer über die Fähigkeiten eines PC-Benutzers verfügen, in der Lage sein, die Struktur von Aktionen zu planen, um das Ziel auf der Grundlage eines festen Satzes von Tools zu erreichen; Objekte und Phänomene durch den Aufbau von Informationsstrukturen beschreiben; Durchführung und Organisation der Suche nach elektronischen Informationen; ein Problem, eine Aufgabe, einen Gedanken etc. klar und eindeutig formulieren

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Gegenwärtig werden an unserem Institut Voraussetzungen geschaffen, um die meisten der oben genannten Probleme zu lösen. Das Wesen der neuen Informationstechnologien besteht darin, Lehrern und Schülern Zugang zu modernen elektronischen Informationsquellen zu verschaffen, Bedingungen für die Entwicklung der Fähigkeit zum Selbstlernen zu schaffen, indem sie kreative Forschungsarbeit von Schülern organisieren, die darauf abzielt, das in verschiedenen Bereichen erworbene Wissen zu integrieren und zu aktualisieren Themen.

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STUDY OF UZBEK AND ENGLISH LANGUAGES DESIGNATION OF QUALITY FROM A LINGUO-CULTUROLOGICAL POINT OF VIEW

Jumaniyazova Malohat Rikhsievna
Senior Lecturer of the Department, Foreign Languages Tashkent, Institute of Chemical Technology, Uzbekistan.

ANNOTATION
This article discusses the issues of studying the linguoculturological features of lexemes denoting signs in the Uzbek and English languages and the general parameters of sign expression in a transverse aspect.
KEY WORDS: *language and culture, national mentality, concepts, linguistic and cultural problems, symbol, linguistics.*

ИЗУЧЕНИЕ ЛЕКСЕМ УЗБЕКСКОГО И АНГЛИЙСКОГО ЯЗЫКОВ, ОБОЗНАЧАЮЩИХ КАЧЕСТВО С ЛИНГВОКУЛЬТУРОЛОГИЧЕСКОЙ ТОЧКИ ЗРЕНИЯ

Джуманиязова Малохат Рихсиевна
Старший преподаватель кафедры
Иностранных языков Ташкентского
химико-технологического института.
Узбекистан.

Аннотация
В данной статье рассматриваются вопросы изучение лингвокультурологические особенности лексем, обозначающих знаки в узбекском и английском языке и общие параметры знаковой экспрессии в поперечном аспекте.
Ключевыеслова:*язык и культура,национальный минталитет, концепты, лингвокультурологические проблемы, символ,языкознание.*

The study of the language and culture of different peoples remains one of the urgent tasks in an environment where international relations are developing and interaction is increasing. In linguistics, by the end of the 20th century, the assumption was made that "language is not related to culture, but itself grows out of culture and is a means of its expression." Meanwhile, language plays an important role in the creation, development and preservation of culture (in the form of texts).

Linguistics (lat. lingua - language + lat. Culture - processing + Greek logos - teaching), considered one of the leading areas of anthropocentric linguistics, was created by the cooperation of the fields of linguistics, cultural studies,

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ethnography, psycholinguistics, the interaction of language with culture, ethnicity, national mentality and is a field that studies influence based on the principles of the anthropocentric paradigm.

"Cultural linguistics studies folk culture, reflected and fixed in language and discourse. First of all, he studies the myths, legends, customs, traditions, customs, principles and symbols of a particular culture.[1.].

In almost all research and educational literature on linguistic culture, the anthropocentric approach to language, although it is explained that it arose anew in the late 20th and early 21st centuries, is rooted in the German scientist V. It is emphasized that it goes back to the well-known von Humboldt's ideas. W. von Humboldt said: "Linguistic diversity is due not only to differences in sounds and signs, but also to differences in how we see the world." B. Humboldt's idea that "language is the mirror of culture" reflects the essence of the field of linguistic culture. At the same time, Alisher Navoi can be recognized as the first researcher of concepts in the field of cultural linguistics. The thoughts of the great thinker about being, the universe, nature and society, social relations, linguistic situations, the human world, the inner world, the psyche, language and speech, language and thinking, the relationship of language and culture are still important today. In the lyrics, epic and scientific works of Alisher Navoi, views on linguoculturalism are reflected, which are considered from new directions in modern Uzbek linguistics.

Sh. Usmanova's treatise "Linguoculturological Aspects of Translation" outlines views on the expression of linguoculturological research in text translation.[2]

Researcher D. Tosheva "Linguoculturological features of proverbs with a zoonymic component" presents information about the origin and development of linguoturology, examines the linguoculturological features of proverbs with a zoonymic component. The number of proverbs with a zoonymic component in the Uzbek language compared to Russian and English is large, and the social and cultural factors of this are highlighted. Proverbs with a zoonymic component were analyzed on the basis of a linguocultural concept. It is shown that the active occurrence of zoonyms in literary sources is determined by the way of life, consisting of cattle breeding and hunting.[3,]

3. Linguistic and cultural problems in the pedagogical process (a study of teacher-student communication in the social sciences).

4. Cross-sectional analyzes (based on comparison with Russian, English, French, German).

Today, linguoculturology has formed and is developing as a separate linguistic direction in Russian and other foreign linguistics, and has entered the system of philological higher education as a subject. The tasks of this direction, whose task is to describe and study the interaction of language and culture, language and ethnicity, language and mentality, are considered as a topic for studying Uzbek linguistics in a more complex aspect.

One of the actively used linguoculturological concepts is the concept. Sh. According to Safarov, "The concept is also a unit of thought, and it is based on a generalization of the concept, image and linguistic meaning. Concept formation begins with the birth of an individual image and ends with the appearance of a language unit. V.A. Maslova defines the concept as follows: "The concept is a semantic structure in which linguistic and cultural identity is noted and which in one way or another characterizes the bearers of a certain ethnic culture[4]

In Russian linguistics, some lexemes denoting signs were studied in the linguoculturological aspect. Based on the concept, Russian and English lexemes are studied. Within the framework of the Russian and English languages, a number of works have been carried out aimed at studying the Russian language in a hybrid aspect. Including A. R. In the study of Kopacheva, a lexeme representing the white color is defined, and the range of its possibilities in poetic speech is analyzed using examples from a literary text. The emphasis is on neutral, positive and negative connotations. In it, the white color is interpreted as a symbol of the pessimistic, i.e. depressed state (death, fate). The study noted that there are universals in the symbolism of colors and that black, white and red are considered universal in all languages[5]

In English linguistics, some lexemes denoting signs were studied in the linguoculturological aspect. Based on the concept, English and English lexemes are studied. Within the framework of the English and English languages, a

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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D. Sergeeva analyzed the concept of "joy" in English and English in a hybrid aspect using the methods of cognitive science, contrast linguistics and philological text research. The researcher says that “emotion is formed in a cultural and historical context. The expression and receipt of emotions in the language is determined by the historical context in which this or that cultural symbol is expressed. Fiction is the scope of such "emotional culture". The paper shows the universal and ethnic aspects of the expression of emotions based on the methods of contrast linguistics on the example of a corpus of texts in two languages[6]

Symbolic lexemes are found in texts of various contents. The literary text expresses the essence of these lexemes, their role in highlighting the characteristic aspects of the picture of the world, their significance in creating a holistic picture of things and events. Each creator uses word-symbols to express the content of a work of art, to increase its effectiveness, to reveal its idea, to express national culture in words, to fully describe the spirit of the time and the psyche of the characters. The writer chooses the right words for each situation and uses them skillfully. Therefore, when studying the characteristic cultural symbols in the Uzbek and English languages, in addition to explanatory dictionaries, literary texts of connotative content were taken as a source. Famous English and Uzbek writers A. S. Pushkin, L. The works of Tolstoy, Abdulla Kadiri, Cholpon are used. The works of Alisher Navoi were used when referring to the history of processes in a synchronous state, in a diachronic approach.

The lexemes denoting signs in English and Uzbek are analyzed by dividing them into lexemes denoting a sign of a person and a sign of an object. In the semantic analysis of lexemes denoting signs in English and Uzbek, in addition to the denotative and significant meanings of lexemes, there is also an expression scheme determined by national cultural values. Clarification of linguistic and cultural problems on the basis of semantic analysis also provides sound scientific conclusions. Since the semantic structure of the lexeme expresses important features of the denotation, these features express the cultural setting. V. A. Zvegintsev “approves the analysis of the semantic development of words from the point of view of logical and semantic events. It should also be analyzed in connection with the history of the people and the structural features of the language.

In any pragmatic sense, a cultural theme is reflected. The lexical meaning is a sememe, and a sememe consists of a seme. Symbols include cultural symbols related to the external environment, expressed through pragmatic meaning. Based on the analysis of the semantics of the lexeme on the example of a literary text, linguoculturological features of lexemes denoting signs in the Uzbek and English languages are highlighted.

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EPRA International Journal of Research and Development (IJRD)
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TOPICAL ISSUES OF USING NON-STANDARD METHODS IN IMPROVING THE ORAL SPEECH OF STUDENTS OF PHILOLOGICAL EDUCATION

Turdaliev Bobur Muhammadalievich
Lecturer at the Department of Languages, Tashkent University of Applied Sciences, Uzbekistan

ANNOTATION
In English classes at a language university, various teaching methods are used to develop oral speech.
Methods and types of teaching have a huge impact on the learning of students of philology. This article deals with the use of various methods and techniques in the formation of oral speech of philology students.
KEY WORDS: *lesson, textbooks, situation, exercise, teaching methods, visual aids, technical means, demonstration, conversation (conversation), reading, listening, homework, dialogical speech.*

АКТУАЛЬНЫЕ ВОПРОСЫ ИСПОЛЬЗОВАНИЯ НЕСТАНДАРТНЫХ МЕТОДОВ В СОВЕРШЕНСТВОВАНИИ УСТНОЙ РЕЧИ СТУДЕНТОВ ФИЛОЛОГИЧЕСКОГО ОБРАЗОВАНИЯ.

Турдалиев Бобур Мухаммадали угли
Преподователь кафедпы Языков Ташкентского университета прикладных наук.Узбекистан.

Аннотация
На уроках английского языка в языковом вузе для развития устной речи используются разные методы обучения.
Методы и виды преподавания имеют огромное влияние на обучение студентов-филологов. В данной статье идёт речь об использования различных методов и приемов в формирования устной речи студентов-филологов.
Ключевые слова: *урок, учебники, ситуация, упражнение, методы обучения, наглядные пособия, технические средства, демонстрирование, беседа (разговор), чтение, аудирование, домашнее задание, диалогическая речь.*

Oral speech is a form of speech activity, including the understanding of sounding speech and the implementation of speech statements in sound form (speaking). Oral speech can be carried out with direct contact of the interlocutors or can be mediated by a technical means (telephone, etc.), if communication takes place at a considerable distance. Oral speech, in contrast to written speech, is characterized by: redundancy (the presence of repetitions, clarifications, explanations); the use of non-verbal means of communication (gestures, facial expressions),

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the economy of speech statements, ellipses (the speaker may not name, skip what you can easily guess). Oral speech is always conditioned by the speech situation. There are: unprepared oral speech (conversation, interview, presentation in the discussion) and prepared oral speech (lecture, report, speech, report); dialogical speech (a direct exchange of statements between two or more persons) and monologue speech (a type of speech addressed to one or a group of listeners, sometimes to oneself).

English is widely spoken throughout the world. You can hear it everywhere: on the street, in shops and restaurants, in offices. You don't need to know Japanese when you go to Japan or French when you visit Paris. English will help you understand each other.

A modern engineer or even a worker deals with tools and machines from other countries and must be able to read instructions that are usually written in English [10, p. 125]. Computer programs and games, most of the Internet pages are also written in English. Scientific journals are mainly published in English, scientific and business conferences are also held in English. Diplomats and the military use English to solve their problems.

In addition, knowledge of English helps to learn more about countries, read many books in the original and make new friends.

It is known that English is the language in which people of most countries of the world not only speak, but also consider it their mother tongue. English is the official language of international conferences and summits. It is the language of economic and political negotiations, debates, the language of science, art, literature and education, the language of many public organizations.

Today, knowledge of English is becoming a mandatory requirement, fluency in a foreign language, along with good professional skills, will allow a specialist to get a decent job and achieve a successful career.

Currently, English has become the language of international communication, great importance is attached to the methods, forms and means of teaching English. Education should be based on the involvement of students in oral and written communication [1, p. 78]. There are different types of speech activity - speaking, understanding foreign language speech (listening), writing, reading, understanding the read text. By using these amazing speech types, you can motivate your children to actively participate in extracurricular activities such as delivering a national event celebration speech or other general celebrations such as farewells, receptions, weddings, retirements, etc. Our written speeches are very simple and easy to learn, as they are written in very simple language and simple words [11, p. 214]. You can choose any of the best English speeches on any topic according to your needs and requirements. All of them are easily understood by students and others.

Speech reading is a very good practice to get rid of hesitation in speaking in front of others, as well as to increase general knowledge on various topics such as Indian culture, traditions, heritage, historical sites, famous places, animals, traditional festivals, the importance of teachers, mothers, national events, social events, happy occasions, famous people, freedom fighters, legends, social issues, etc.

We have also prepared Wedding Anniversary Speeches, Farewell Speeches, Welcome Speeches, Thank You Speeches, Retirement Speeches and many other general topics, as well as Amazing Speeches in English from Famous People.

Initially, English is taught in schools. They study grammar, phonetics, morphology, texts, etc. The teaching of a foreign language continues at universities. Particular attention is paid to the oral and written speech of students and their use in speech, their translation into questions, dialogues, tasks, etc.

All these methods help to improve students' oral speech. Students are encouraged to constantly improve their knowledge of the English language. The task of the teacher is to teach students to communicate in English, creating certain situations that will help them in life and teach them how to find the best solution. The lesson is an integral part of the learning process. This is such an organizational form of education in which the teacher controls the collective cognitive activity of students for a precisely set time [5, p. 98].

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This is a complete segment of the educational process in the semantic, temporal and organizational sense. Ideally, a foreign language lesson should simultaneously solve a number of tasks. As a rule, when preparing for a lesson, the teacher identifies one or more leading goals, this is a practical goal [3, p. 147].

Situation is a vital condition for learning colloquial speech. A situation is a system of relationships between interlocutors. The main significance of situationality lies in the fact that it is necessary both for the formation of speech skills and for the development of speech skills. An important requirement is speech orientation. Speech orientation primarily means the practical orientation of the lesson, as well as learning in general.

Speech orientation refers to the speech nature of all exercises that are motivated by storytelling. Teaching oral speech in a foreign language is used as a means of teaching communication for its intended purpose.

Consider the study of spoken language as a means of communication. When we say "communication", the question naturally arises as to who communicates with whom and for what reason the communication takes place.

For example:

• Communication of the teacher in English with students in the classroom. Teaching a foreign language to students who begin studying at a university presents a significant difficulty, lack of study time, insufficient philological training in a non-linguistic university, lack of proper knowledge of a foreign language [4, p. 161]. Therefore, teachers should develop students' formed speech skills in accordance with the requirements of the university. Communication of students with an English teacher when studying a particular topic;

• Working on tests with the help of a teacher;

• Communication of students during extracurricular activities;

• Independent work with texts. The main goal is to teach and perform exercises on the topic;

• After text work or the final stage of working with text.

• Teacher-student communication takes place at all stages of the lesson. The teacher uses English for greetings, when organizing work, during the lesson attracts the attention of students and sets the task to complete the task when asked [9, p. 124].

• Work on the dictionary. - tell

• Work on texts. – read

• Listen and write

• Ask questions and answer, describe.

When communicating with teachers, it is important that they understand English. When using a new expression to conduct a lesson, it is necessary to draw students' attention to the meaning of this expression [6, p. 109].

This article includes a methodology for the learning process: sections, speech development, including listening and dialogue. Speech is a rather complex phenomenon and form of oral communication, which is carried out both in oral and written speech.

The goal of teaching oral speech is to develop students' abilities that correspond to real needs and interests, the ability to communicate verbally in various situations [14, p. 145]. Dialogic speech is the main form of communicative communication. To teach the dialogical communicative nature of speech, the teacher must use various exercises.

In further improvement of oral speech of philologist-students, the role of fiction studied in classes is also great. analysis of literary works leads to the development of both their oral and written discourses and worldviews of students.

The purpose of teaching English involves mastering the English language by students as a form of communication, as well as the implementation in this process of all types of education, training and personality formation of students.

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QUESTIONS OF THE METHODOLOGY OF TEACHING RUSSIAN AS A FOREIGN LANGUAGE IN A NON-PHILOLOGICAL UNIVERSITY

Tursunov Ibragim Nuralievich[1], Tursunova Aziza Muminovna[2]
Teachers of the Department of Languages,Tashkent University Applied Sciences. Uzbekistan.

ANNOTATION
This article is devoted to topical issues of the methodology of teaching Russian as a non-native language in a non-linguistic university. The right choice of methodology and approach helps to motivate students of non-linguistic specialties and forms an interest in learning the Russian language.
KEYWORDS: *subject of methodology, joint activity, educational process, principle of communication, speech activity, teaching methods, desired result, reading comprehension.*

ВОПРОСЫ МЕТОДИКИ ОБУЧЕНИЯ РУССКОМУ ЯЗЫКУ КАК ИНОСТРАННОМУ В НЕФИЛОЛОГИЧЕСКОМ ВУЗЕ

Турсунов Ибрагим Нуралиевич,
Турсунова Азиза Муминовна
Преподователи кафедры Языков
Ташкентского университета
прикладных наук.Узбекистан.

Аннотация
Данная статья посвящена актуальным вопросам методики преподавания русского языка как неродного в неязыковом вузе. Правильный выбор методики и подхода помогает мотивировать студентов неязыковых специальностей и формирует интерес к изучению русского языка.
***Ключевые слова**: предмет методики, совместная деятельность, учебный процесс, принцип коммуникативности, речевая деятельность, методы обучения, желаемый результат, понимание прочитанного.*

Предмет методики – это обучение русскому языку как средству общения – определяет конечную цель – «владеть языком».

Обучение русскому языку как иностранному (и вообще любому предмету) – это совместная деятельность преподавателя и учеников. Чтобы ученики овладели языком, преподаватель должен осуществлять определенные учебные (обучающие) действия: объяснить новый материал, дать задание, задать вопрос и проконтролировать правильность ответа и т.д. Ученики тоже должны быть активными и осуществлять в ходе

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учебного процесса ряд действий: прочитать текст, выучить слова, выполнить упражнения, ответить на вопросы преподавателя и т.д.

В обычных формах обучения действия учащихся всегда определяются и направляются преподавателем. Именно он решает, что нужно сделать ученикам, в какой момент, в какой последовательности, для какой цели. И, конечно, он же определяет, что и как делать на уроке (даже и вне урока) ему самому. Он и непосредственно учит, и учит учеников учиться. Но любой преподаватель знает, что не всегда обучающие действия учителя дают желаемый результат.

Как сделать, чтобы действия учителя были наиболее эффективными?

Нужно разъяснить ему, какими методами, способами, приемами ему следует пользоваться, как сочетать их друг с другом, как вести себя в аудитории, чтобы добиться требуемой цели.

Другими словами, нужно научить его сознательно управлять учебным процессом, в том числе сознательно организовывать свои собственные обучающие действия, чтобы учебный процесс давал нам лучшие результаты.

Предмет методики обучения русскому языку как иностранному – это система управления учебным процессом, т.е. система, направленная на наиболее эффективное овладение учащимися русским языком.

Процесс получения знаний с каждым годом ускоряется. В Ташкентскоммеждународном университетеКимёрусский язык изучается во всех направлениях, поэтому студентам необходимо дать основную терминологию по специальности, которую они в дальнейшем смогут понимать, читая литературу по специальности. В этом ему может помочь методика обучения, которая преподносится преподавателем в аудитории.

Обучение русскому языку ставит своей задачей достижение следующих целей:

- обучение устной речи в пределах ситуаций, в которых может оказаться студент при общении;
- обучение навыкам ознакомительного чтения (понимание общего содержания текста) на материале журналов, газет, Интернета, радио и телевидения и др.;
- обучение устному профессиональному общению при контактах со специалистами разных отраслей;
- обучение навыкам изучающего чтения (понимание всей информации) банковской, архитектурной, международного бизнеса.

Методические основы обучения русскому языку подразделяются на:

Принцип коммуникативности в обучении.Коммуникативность предполагает практическую направленность обучения русскому языку. Это означает соответствие процесса и методов обучения тем намерениям, ради которых студент занимается языком.

Желания студента связаны с возможностями общения, которые даёт русский язык: возможностью слушать, говорить, читать, писать на нём.

Принцип коммуникативности отводит изучению грамматики служебную роль. Грамматика изучается для практического пользования речью. Это позволяет не заучивать грамматические правила и соответственно делает невозможным со стороны преподавателя контролировать их теоретическое усвоение студентами.

Обучение видам речевой деятельности. Современная методика рассматривает овладение речевой деятельностью в четырёх видах: слушание (аудирование), говорение, чтение и письмо.

Говорение и письменная речь – продуктивные виды речевой деятельности; аудирование и чтение – рецептивные виды. Для овладения видами речевой деятельности необходимо приобрести навыки умения.

Каждому, кто изучает язык, известно, что чтение способствует активизации навыков говорения и слушания, а речевая практика помогает развитию навыков чтения.

Обучение устной речи осуществляется по следующей схеме: презентация (представление) речевого материала в виде диалога; диалоги для наблюдения; грамматические таблицы, которые показывают студентам

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закономерность языковых явлений и являются инструкциями для конструирования предложений; подстановочные таблицы, которые дают возможность повторения усваиваемого материала; упражнения на восстановление недостающих реплик в диалогах.

Система упражнений по обучению устной речи направлена на формирование навыков диалогической речи, а выполнение вопросно-ответных упражнений формирует навыки монологической речи.

Успех обучения устной речи зависит от непринуждённой, доброжелательной обстановки, которую создает преподаватель в группе. Не следует акцентировать внимание на ошибках студентов; необходимо ненавязчиво исправлять их повторением фразы в исправленном варианте.

Преподаватель должен помочь студентам преодолеть боязнь ошибки и своим поведением убедить: что лучше сказать с ошибкой, чем ничего не сказать. Педагог не должен показывать негативного отношения к неудовлетворительной речи студента; основным фактором его воздействия должна быть похвала.

Обучение ознакомительному чтениюосуществляется по следующей схеме: презентация лексико-синтаксической модели; упражнения на наблюдение синтаксического явления; комбинированные упражнения – построение на основе элементарных предложений более крупных синтаксических структур; упражнения на определение принадлежности слов к частям речи, на определение формы слова; упражнения для семантизации лексики, которая осуществляется через перевод или на основе догадки по конспекту, по словообразовательным морфемам; упражнения на определение сочетаемости слов; контроль понимания прочитанного; беседа на тему текста.

Вышеперечисленные типы упражнений предусматривают выработку следующих навыков;

- пользоваться словарем;
- определять начальную форму слова;
- различать слова по частям речи, т.е. уметь отнести слово к группе слов, отвечающих на один и тот же вопрос и имеющих общее значение предметности, признака, действия и т.д.;
- понимать синонимию форм конструкций;
- усвоить объем лексики, достаточный для чтения статей из журналов и газет, книг, Интернета.

Студенты читают по-разному; в одном случае необходимо составить общее представление о тексте, проследить сюжетную линию (ознакомительное чтение), в другом – полно воспринять содержание текса. (изучающее чтение).

При ознакомительном чтении текст читается целиком (сплошное чтение), в быстром темпе; улавливается главное развитие событий, не акцентируя внимание на деталях.

При изучающем чтении текст читается медленно, с возвратом к непонятным местам; при этом осуществляется установка на длительное запоминание текста.

Студенты, изучающие русский язык и которые хотят его знать, эффективно и плодотворно работают, используя вышеописанные методы в аудитории, а слабые студенты увлекаются этой работой, что тоже помогает им в быстром овладении русским языком. Как показывает наш опыт работы, при правильной грамотной организации преподавателем учебного процесса у студентов вырабатывается стиль, который поможет им в формировании профессионального качества.

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SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 7 | Issue: 12 | December 2022 - Peer Reviewed Journal

RECIPROCAL SYMMETRY AND ITS GRAMMATICAL INDICATIONS

Sharipov Bobur Salimovich
Assistant teacher Department of Langages, Samarkand State Medical University, Samarkand, Uzbekistan

ABSTRACT
The article talks about the direct connection of reciprocity with the concept of symmetry and the derivation of reciprocal devices. In fact, the concept of symmetry is related to the exact sciences, and it is used in linguistics in the application of the meanings of reciprocity, cause and effect. Symmetry of movement between its participants is very important in interaction. Because this is the basis for the formation of a reciprocal device of elements expressing the meaning of interaction. Reciprocal operators play a key role in the formation of the symmetry phenomenon. After all, derivation does not occur without an operator.
KEY WORDS: *reciprocal, symmetry, operator, operand, derivative, dereciprocal, reciprocal, syntactic and semantic derivation, contact and distant reciprocal, sociative.*

INTRODUCTION

As we mentioned in our previous works, reciprocal devices mean an action performed jointly by two or more participants. In the case of reciprocity, these participants are equally active object/subject ← → object/subject in the performance of a certain action. As O. Jespersen correctly pointed out, if A meets B on the street, then B also meets A. On the basis of this general sign, the structure of reciprocity is formed, which represents a mutual relationship [1.183].

F. Lichtenberg believes that in the situation of reciprocity there are only two referents consisting of A and B[2.21]. In our opinion, it is not correct to limit the number of participants in reciprocity. After all, the meaning of reciprocity is based on logical symmetry. Therefore, the concept of logical symmetry can arise between several referents.

In logic, the relation R between x and y is called symmetry. For example, if the relation xRy is true, then its inverse yRx is also true [3.113]. Since reciprocity is a means of expressing grammatical meaning, we observe the existing process in it.

RESULTS AND DISCUSSION

Symmetry of movement between its participants is very important in interaction. Because this is the basis for the formation of a reciprocal device of elements expressing the meaning of interaction.For example: And the two young children clung to each other in endless joy... (Cholpon. Night and day)

In the given example, it can be seen that there is a symmetrical movement between two referents. This symmetric movement occurs with the help of operators such as two, one, -s, which form a reciprocal device. The reason why we call these elements reciprocal operators is that when the speaker takes the formation (symmetry) of the reciprocal device as a basis for expressing his speech, he chooses from the paradigmatic series exactly those tools that we consider as operators. Otherwise, a dereciprocal device will appear. Compare:

And the two young boys clung to each other again in endless joys - And the young boy clung to (him) again in endless joys.

Symmetry is not observed in the second sentence being compared. Because there are no reciprocal operators involved in this situation. In other words, in the dereciprocal case, the referent is one, and the specific action is performed by him alone. That is why operators play an important role in derivation (including reciprocal derivation).

At this point, it is natural to ask the question of which type of derivation we include the formation of a reciprocal device. Since reciprocity is a semantic phenomenon, the emergence of the meaning of unity by means of reciprocal operators is a product of semantic derivation, the ratio of unity existing on the basis of the applicative model to the operand, plural suffixes or other words expressing the meaning of mutual relation. and we interpret the combination with words as a product of syntactic

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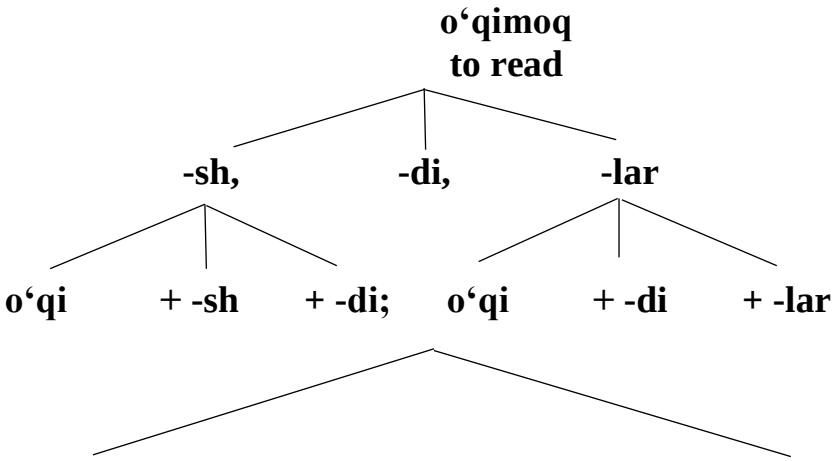
Volume: 7 | Issue: 12 | December 2022 - Peer Reviewed Journal

derivation.In addition, we can say that the plural form of any verb is a reciprocal device derivation: we worked, you worked, they worked. This is shown in the following diagram:



Birgalik ma’nosi — Mikro retsiprokli qurilma

Reciprocal Meaning — **Micro Reciprocating Device**

(Semantik derivatsiya mahsuli) — (Sintaktik derivatsiya mahsuli)

(**Product of Semantic Derivation)** — **(Product of syntactic derivation)**

So, in this place, two types of derivation intersect at one point in the formation of reciprocity. We can explain the occurrence of reciprocal derivation in the same way that B.N. Turniyazov analyzed the occurrence of causal derivation. In particular, the scientist says: "...write is a causal operand expressing action, -dir is a causal operator. However, in order for the causative operator to interact with the action, the causer, that is, the person who encourages the action, also plays an important role. Causation, in turn, is aimed at the executor. So, at the same time, we see the connection between causer + causeoperand + causeoperator + executor. It would be correct to study the formation of causativeness in the Uzbek language with special additions as the affixation method of morphological causation. In other words, we understand this process as microcausative derivation associated with morphosyntax. Its derivative only serves to express the causal meaning" [4.27].

Based on this idea, we also analyze the reciprocal derivation in the same way. But it is not always possible to observe the person who encourages the reciprocal action. Because the executors of reciprocal action perform certain tasks in their own way. Thus, in this situation, we observe the connection between the reciprocal operand + reciprocal operator + executors + the relation of the action to the moment: yoz +ish + di(they wrote). This, in turn, requires the symmetry of the action performers. The performers are performing the same action at the same time. We can also take the sense of togetherness expressed by the existing reciprochem as contact or distant. If the executors of the action are performing the same action at the same time in a common plan, then reciprocity is considered contact. But if the performers of the action perform the same action separately for themselves at the same time, we call it distant reciprocity. Therefore, the existence of symmetry in both cases cannot be denied. The concept that we define as distant reciprocal is also called by the term "sociative" in the linguistic literature. "It is a form of social reciprocity," says V. Nedyalkov, "it is a form of interaction that expresses symmetry between actants with the same semantic role" [5.277].

Sociative unity is an instrumental case in the form, characteristic of the Basque language[6.444]. Basque is the official language of the Basque Country (along with Spanish). It is considered as a separate language in genealogical classifications. There are conclusions that the Basque language is related to the languages of the Caucasus. The writing of this language, which belongs to agglutinative languages, is based on the Latin alphabet.

It should be said that the combination of weapon and tool is also present in the ancient Turkish language, and the meaning expressed by it means the connection between the action and the weapon or means of the action. This form of case includes suffixes such as -n, -in, -un. For example: Kəzun kərduk, kulakin əsidməduk ("Kultegin") like [7.64]. After the 14th century, meaning of this case began to be expressed through auxiliaries such as with, ila,minan. Nowadays, some of the words of this form have shifted to the meaning of adverb: together. In social reciprocity, the referent object in the role of possessor does not have the status of a subject. For example:

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The people who came out of Qalandarkhana Street now reached Akhiy Jabbars (M.Ali.captains).

In this case, the word people is the subject, and the compound Akhiy Jabbars is the object. In pure reciprocity, referents act as both object and subject. For example:

...the generals quickly understood that the enemy was attacking (M.Ali. Captains).

The cited example differs from the above social reciprocity in that the performers of the action are in the object-subject relationship. As grammatical indicators of the symmetry of reciprocity in these examples, the combination of referents + analytic reciprocema, such as "people reached" and "soldiers understood".The reason why we use the term "analytical reciprocema" is that the basic structure of the first example is expressed by an auxiliary verb, and the basic structure of the second example is expressed by a compound verb. Such reciprochems differ from reciprochems formed by addition depending on the degree of derivation. For example, the connection between the components of two reciprocals requires a microsyntagmatic relationship. But the relationship between the components of analytic reciprochem differs from affixal reciprochem by its macrocharacter. Accordingly, it takes place hierarchically in the paradigm of compound verb, leading verb. Compare: yoz + ish+ di(they wrote) (affixal reciprocema); yet + ib → ol + ish + di (they caught up) (analytic reciprochem).

As we can see, affixal reciprochem components require a two-step derivation, and analytic reciprochem components require a four-step derivation. Because in it, the concept of reciprocity is formed not by one word, but by the mutual syntagmatic relationship of two words. As S. Shaumyan correctly noted, the generator area of larger devices covers a relatively wider area. From it, larger applicit semions are formed through the connector scheme [8.209-211]. This application model will have the following formula:

W=O+R1→W=O+R2+R3/WOR1R2R3=Ar (analytical reciprocal)

It should be said that the referent acting as possessor becomes subject and object in the performance of an action, not only in the reciprocal device. For example:

After thinking for a while, he came to the decision that it is necessary to please the owner (M.Ali. Captains).

In the given example, the possessive referent is both subject and object. It remains a reflexive device only because the action expression is performed on the referent itself.

One of the grammatical means of expressing reciprocity is the pronoun we. This pronoun also shows symmetry in the execution of the action:

1. Whatever we do with Akbar, will your problem be easy, my lord? (P. Kadirov. Pass of Generations)
2. If India is meat, we grew like nails in it (P. Kadirov. Passage of Generations).

In the first of the given examples, as reciprocal derivation operators, the pronoun we, the auxiliary with and the indicative form of the conditional verb in the first person plural -k appear. In the second example, this function is performed by the pronoun we and the plural indicator -k. Our first example is formed as a comitative reciprocal. Because with it, an assistant participates, and the execution of a certain action by means of something or someone is expressed. In addition, the reciprocal action has not yet been completed. Therefore, we call such a reciprocal conditional.

In the second example, since the reciprocal action is performed, we know that unis of reciprocal. There is reciprocal symmetry in both situations.

CONCLUSION

Thus, in our article, we have expressed our thoughts and opinions about the symmetry of reciprocity and the tools that represent it. We proved that reciprocity can be realized analytically and affixally. We found out that compound verbs and word combinations with auxiliary verbs form analytic reciprocals, and singular relations and plurals form affixal reciprocals. We justified the fact that these tools act as operators in the derivation of reciprocal devices. We have analyzed the existence of pure, sociative, and comitative types of reciprocity on the basis of factual language materials taken from artistic works.

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EPRA International Journal of Research and Development (IJRD)
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A SINGLE AND LINEAR CONTROL DESIGN FOR A CLASS OF NONLINEAR SYSTEMS WITH UNKNOWN PARAMETERS AND UNCERTAIN ACTUATOR NONLINEARITIES

Yeong-Jeu Sun[1], **Sheng-Chieh Chen**[2], **Feng-Yi Sung**[3]
[1] *Professor,* [2,3] *Postgraduate*
Department of Electrical Engineering, I-Shou University, Kaohsiung, Taiwan

ABSTRACT
In this paper, the robust stabilization for a class of nonlinear systems with unknown parameters and uncertain actuator nonlinearities is investigated. Based on differential and integral inequalities, a simple linear control is offered to realize the global exponential stabilization of such uncertain systems. Besides, the guaranteed exponential decay rate can be correctly calculated. Finally, several numerical simulation results will be provided to demonstrate the correctness and effectiveness of the main results.
KEYWORDS: *Robust stabilization, Uncertain systems, Global exponential stabilization, Exponential decay rate*

1. INTRODUCTION

As we know, there are more or less uncertain factors in real physical systems. These uncertainties may come from unknown noise, incomplete models, or uncertain system parameters. If these uncertain factors are not taken into account, the designed controller often cannot achieve the expected goal, and even cause system instability or oscillation. Furthermore, if these uncertain factors are considered, the design of the controller becomes extremely difficult because the model is too complex.

In recent years, the design of robust controllers for uncertain systems has been explored and proposed by many researchers; see, for example, [1]-[10] and the references therein. Various methodologies in the robust control have been proposed, such as Lyapunov approach, adaptive control, linear matrix inequalities, variable structure control, fuzzy adaptive control design strategy, and others.

This paper considers the problem of controller design for a class of nonlinear systems with both unknown parameters and uncertain actuators. Using differential and integral inequalities, a simple hardware-implemented linear controller is designed to promote such uncertain systems to achieve the global exponential stability. Meanwhile, the guaranteed exponential decay rate can be correctly calculated. Finally, several numerical simulation results will be provided to show the correctness and effectiveness of the main theorem. Throughout this paper, $|a|$ denotes the modulus of a real number a and $\|x\|$ denotes the Euclidean norm of the vector $x \in \Re^n$.

2. PROBLEM FORMULATION AND MAIN RESULTS

Consider the following uncertain nonlinear systems with unknown parameters and uncertain actuator nonlinearities described by

$$\dot{x}_1 = \Delta a(t)x_1 + \Delta d_1(t)x_2 + f_1(x_1, x_2, x_3, x_4), \tag{1a}$$

$$\dot{x}_2 = \Delta d_2(t)x_1 + \Delta d_3(t)x_2 + \Delta d_4(t)x_3 + \Delta d_5(t)x_4 + f_2(x_1, x_2, x_3, x_4) + \Delta\phi(u), \tag{1b}$$

$$\dot{x}_3 = \Delta d_6(t)x_2 + \Delta b(t)x_3 + f_3(x_1, x_2, x_3, x_4), \tag{1c}$$

$$\dot{x}_4 = \Delta d_7(t)x_2 + \Delta c(t)x_4 + f_4(x_1, x_2, x_3, x_4), \quad \forall\, t \geq 0, \tag{1d}$$

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where $x(t) := [x_1(t) \quad x_2(t) \quad x_3(t) \quad x_4(t)]^T \in \Re^{4\times 1}$ is the state vector, $u \in \Re$ is the control input, $\Delta a(t), \Delta b(t), \Delta c(t),$ and $\Delta d_i(t)$ are unknown time-varying parameters, f_i is nonlinear term with $f_i(0,0,0,0) = 0, \forall\, i \in \{1,2,3,4\}$, and the operator of $\Delta\phi(u): \Re \to \Re$, is the uncertain actuator nonlinearity. In addition, in order to ensure that the uncertain systems of (1) have solution, we assume that $f_1, f_2, f_3,$ and f_4 are smooth functions.

Throughout this paper, we make the following assumptions:

(A1) There exist constants $\bar{a}, \underline{a}, \bar{b}, \underline{b}, \bar{c}, \underline{c},$ and $\overline{d_i}$ such that

$$-\bar{a} \le \Delta a(t) \le -\underline{a} < 0, \quad -\bar{b} \le \Delta b(t) \le -\underline{b} < 0,$$
$$-\bar{c} \le \Delta c(t) \le -\underline{c} < 0, \quad |\Delta d_i(t)| \le \overline{d_i}, \quad \forall\, i \in \{1,2,3,4,5,6,7\}.$$

(A2) There exists a positive number r_1 such that uncertain actuator nonlinearity satisfies

$$r_1 \cdot u^2 \le u \cdot \Delta\phi(u).$$

(A3) $\sum_{i=1}^{4} x_i \cdot f_i(x_1, x_2, x_3, x_4) = 0$.

The definition of global exponential stabilization for the uncertain systems (1) is as follows.

Definition 1: If there exist a control *u* and positive number α satisfying

$$\|x(t)\| \le \|x(0)\| \cdot e^{-\alpha t}, \quad \forall\, t \ge 0,$$

the uncertain system (1) is said to be globally exponentially stable. At the same time, the positive number α is called the exponential decay rate.

The purpose of this paper is to design a suitable control *u* to ensure global exponential stability of the system (1). Besides, we will figure out the exponential decay rate of the uncertain system.

Now we present the main result for the global exponential stabilization of uncertain systems (1) via differential and integral inequalities.

Theorem 1: The uncertain systems (1) with (A1)-(A3) is globally exponentially stable under the following linear controller

$$u = -\left(\frac{\alpha_1 + \alpha_2 + \alpha_3 + \alpha_4 + \overline{d_3}}{r_1} \right) x_2, \tag{2a}$$

where

$$\alpha_1 = \frac{\left(\overline{d_1} + \overline{d_2}\right)^2}{\underline{a}}, \quad \alpha_2 = \frac{\left(\overline{d_4} + \overline{d_6}\right)^2}{\underline{b}}, \quad \alpha_3 = \frac{\left(\overline{d_5} + \overline{d_7}\right)^2}{\underline{c}}, \tag{2b}$$

with any $\alpha_4 > 0$. In this case, the guaranteed exponential decay rate is calculated as

$$\alpha := \min\left\{ \frac{3\underline{a}}{4}, \quad \frac{3\underline{b}}{4}, \quad \frac{3\underline{c}}{4}, \quad \alpha_4 \right\}. \tag{3}$$

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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Proof: Let

$$V(x(t)) := x_1^2(t) + x_2^2(t) + x_3^2(t) + x_4^2(t). \tag{4}$$

The time derivative of $V(x(t))$ along the trajectories of the closed-loop systems (1) with (2)-(3) and (A1)-(A3), is given by

$$\begin{aligned}
\dot{V}(x(t)) &= 2x_1\dot{x}_1 + 2x_2\dot{x}_2 + 2x_3\dot{x}_3 + 2x_4\dot{x}_4 \\
&= 2x_1(\Delta a x_1 + \Delta d_1 x_2 + f_1) \\
&\quad + 2x_2[\Delta d_2 x_1 + \Delta d_3 x_2 + \Delta d_4 x_3 + \Delta d_5 x_4 + f_2 + \Delta\phi(u)] \\
&\quad + 2x_3(\Delta d_6 x_2 + \Delta b x_3 + f_3) + 2x_4(\Delta d_7 x_2 + \Delta c x_4 + f_4) \\
&\le -2\underline{a}x_1^2 + 2\overline{d_1}|x_1||x_2| + 2\overline{d_2}|x_1||x_2| + 2\overline{d_3}x_2^2 + 2\overline{d_4}|x_2||x_3| + 2\overline{d_5}|x_2||x_4| \\
&\quad + 2\overline{d_6}|x_2||x_3| - 2\underline{b}x_3^2 + 2\overline{d_7}|x_2||x_4| - 2\underline{c}x_4^2 + 2(x_1 f_1 + x_2 f_2 + x_3 f_3 + x_4 f_4) \\
&\quad + 2x_2\Delta\phi(u) \\
&= -2\underline{a}x_1^2 + 2(\overline{d_1} + \overline{d_2})|x_1||x_2| + 2\overline{d_3}x_2^2 + 2(\overline{d_4} + \overline{d_6})|x_2||x_3| + 2(\overline{d_5} + \overline{d_7})|x_2||x_4| \\
&\quad - 2\underline{b}x_3^2 - 2\underline{c}x_4^2 + 2x_2\Delta\phi(u) \\
&= -2\underline{a}x_1^2 + 2(\overline{d_1} + \overline{d_2})|x_1||x_2| + 2\overline{d_3}x_2^2 + 2(\overline{d_4} + \overline{d_6})|x_2||x_3| + 2(\overline{d_5} + \overline{d_7})|x_2||x_4| \\
&\quad - 2\underline{b}x_3^2 - 2\underline{c}x_4^2 - \frac{2r_1 u\Delta\phi(u)}{\alpha_1 + \alpha_2 + \alpha_3 + \alpha_4 + \overline{d_3}} \\
&= -2\underline{a}x_1^2 + 2(\overline{d_1} + \overline{d_2})|x_1||x_2| + 2\overline{d_3}x_2^2 + 2(\overline{d_4} + \overline{d_6})|x_2||x_3| + 2(\overline{d_5} + \overline{d_7})|x_2||x_4| \\
&\quad - 2\underline{b}x_3^2 - 2\underline{c}x_4^2 - \frac{2r_1^2 u^2}{\alpha_1 + \alpha_2 + \alpha_3 + \alpha_4 + \overline{d_3}} \\
&= -2\underline{a}x_1^2 + 2(\overline{d_1} + \overline{d_2})|x_1||x_2| + 2\overline{d_3}x_2^2 + 2(\overline{d_4} + \overline{d_6})|x_2||x_3| + 2(\overline{d_5} + \overline{d_7})|x_2||x_4| \\
&\quad - 2\underline{b}x_3^2 - 2\underline{c}x_4^2 - 2(\alpha_1 + \alpha_2 + \alpha_3 + \alpha_4 + \overline{d_3})x_2^2 \\
&= -2\left(\frac{3\underline{a}}{4}x_1^2 + \alpha_4 x_2^2 + \frac{3\underline{b}}{4}x_3^2 + \frac{3\underline{c}}{4}x_4^2\right) - 2\left[\frac{\underline{a}}{4}x_1^2 - (\overline{d_1} + \overline{d_2})|x_1||x_2| + \alpha_1 x_2^2\right] \\
&\quad - 2\left[\frac{\underline{b}}{4}x_3^2 - (\overline{d_4} + \overline{d_6})|x_2||x_3| + \alpha_2 x_2^2\right] - 2\left[\frac{\underline{c}}{4}x_4^2 - (\overline{d_5} + \overline{d_7})|x_2||x_4| + \alpha_3 x_2^2\right] \\
&= -2\left(\frac{3\underline{a}}{4}x_1^2 + \alpha_4 x_2^2 + \frac{3\underline{b}}{4}x_3^2 + \frac{3\underline{c}}{4}x_4^2\right) - 2\left[\frac{\sqrt{\underline{a}}}{2}|x_1| - \sqrt{\alpha_1}|x_2|\right]^2 - 2\left[\frac{\sqrt{\underline{b}}}{2}|x_3| - \sqrt{\alpha_2}|x_2|\right]^2 \\
&\quad - 2\left[\frac{\sqrt{\underline{c}}}{2}|x_4| - \sqrt{\alpha_3}|x_2|\right]^2 \\
&\le -2(\alpha x_1^2 + \alpha x_2^2 + \alpha x_3^2 + \alpha x_4^2) \\
&= -2\alpha V, \quad \forall\, t \ge 0.
\end{aligned}$$

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Hence, one has

$$e^{2\alpha t}\cdot\dot{V}+e^{2\alpha t}\cdot 2\alpha V=\frac{d}{dt}\left[e^{2\alpha t}\cdot V\right]\le 0,\quad \forall\, t\ge 0.$$

It results

$$\int_0^t \frac{d}{d\tau}\left[e^{2\alpha\tau}\cdot V(x(t))\right]d\tau = e^{2\alpha t}\cdot V(x(t))-V(x(0))\le \int_0^t 0\,d\tau = 0,\quad \forall\, t\ge 0. \tag{5}$$

From (4) and (5), it follows

$$\|x(t)\|^2 = V(x(t))\le e^{-2\alpha t}V(x(0)) = e^{-2\alpha t}\|x(0)\|^2,\quad \forall\, t\ge 0.$$

As a consequence, we conclude that

$$\|x(t)\|\le e^{-\alpha t}\|x(0)\|,\quad \forall\, t\ge 0.$$

This completes the proof. □

Remark 1: It is worth mentioning that the proposed controller of (2) is not only a linear controller, but only a single controller can achieve the goal of global exponential stability.

3. NUMERICAL SIMULATIONS

The following examples are presented to illustrate the usefulness of the proposed theoretical results.

Example 1: Consider the uncertain systems (1) with

$$f_1=-x_1x_2x_3x_4,\quad f_2=5x_1^2x_3x_4,\quad f_3=-3x_1^2x_2x_4,\quad f_4=-x_1^2x_2x_3, \tag{6a}$$

$$\underline{a}=3,\quad \underline{b}=2,\quad \underline{c}=4,\quad \overline{d_i}=1,\quad \forall\, i\in\{1,2,3,4,5,6,7\}, \tag{6b}$$

$$\Delta\phi(u)=\Delta d_8u+\Delta d_9u^3,\quad \Delta d_8\ge 1,\quad \Delta d_9\ge 0. \tag{6c}$$

By choosing the parameter $r_1=1$, (A2) is obviously satisfied. From (2), we have $\alpha_1=\frac{4}{3},\alpha_2=2,\alpha_3=1$. With the choice $\alpha_4=1$, from (2) and (3), it can be readily obtained that $u=\frac{-19}{3}x_2$ and $\alpha=1$. As a consequence, by Theorem 1, we conclude that the uncertain system (1) with (6) and the linear control $u=\frac{-19}{3}x_2$ is globally exponentially stable. Furthermore, the guaranteed exponential decay rate is calculated as $\alpha=1$. Typical state trajectories for the uncontrolled system and the feedback-controlled system are shown in Figure 1 and Figure 2, respectively. In addition, the control signal and electronic circuits to realize this control law are shown in Figure 3 and Figure 4, respectively.

Example 2: Consider the uncertain systems (1) with

$$f_1=f_4=0,\quad f_2=-x_1x_3,\quad f_3=x_1x_2, \tag{7a}$$

$$\underline{a}=12,\quad \underline{b}=2.1,\quad \underline{c}=0.2,\quad \overline{d_i}=1,\quad \forall\, i\in\{3,4,5,6\} \tag{7b}$$

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$$\Delta\phi(u) = \Delta d_8 u + \Delta d_9 u^3, \quad \Delta d_8 \geq 1, \quad \Delta d_9 \geq 0. \tag{7c}$$

By choosing the parameter $r_1 = 1$, (A2) is obviously satisfied. From (2), we have $\alpha_1 = 102.1, \alpha_2 = 1.9, \alpha_3 = 245$. With the choice $\alpha_4 = 1$, from (2) and (3), it can be readily obtained that $u = -351x_2$ and $\alpha = 0.15$. Consequently, by Theorem 1, we conclude that the uncertain system (1) with (7) and the linear control $u = -351x_2$ is globally exponentially stable. Furthermore, the guaranteed exponential decay rate is calculated as $\alpha = 0.15$. Typical state trajectories for the uncontrolled system and the feedback-controlled system are shown in Figure 5 and Figure 6, respectively. In addition, the control signal and electronic circuits to realize this control law are shown in Figure 7 and Figure 8, respectively.

CONCLUSIONS

In this paper, the robust stabilization for a class of nonlinear systems with unknown parameters and uncertain actuator nonlinearities has been explored. Based on differential and integral inequalities, a simple linear control has been offered to realize the global exponential stabilization of such uncertain systems. Besides, the guaranteed exponential decay rate can be correctly calculated. Finally, several numerical simulation results have been provided to show the correctness and effectiveness of the main results.

ACKNOWLEDGEMENT

The authors thank the Ministry of Science and Technology of Republic of China for supporting this work under grant MOST 109-2221-E-214-014.

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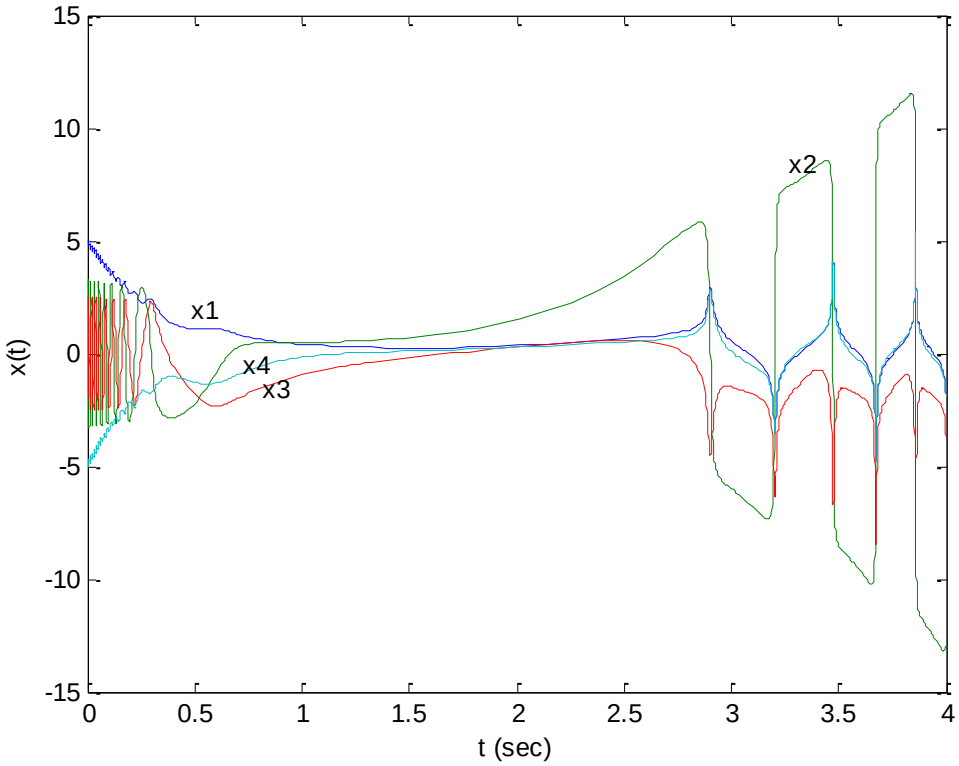

Figure 1: Typical state trajectories of the uncontrolled system of Example 1.

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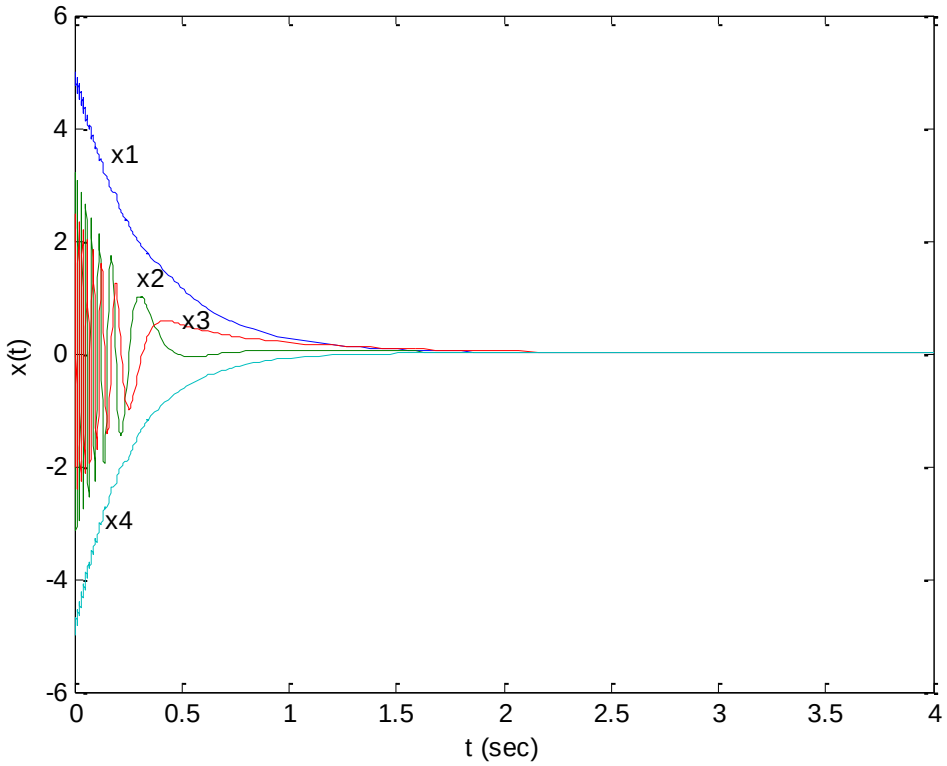

Figure 2: Typical state trajectories of the feedback-controlled system of Example 1.

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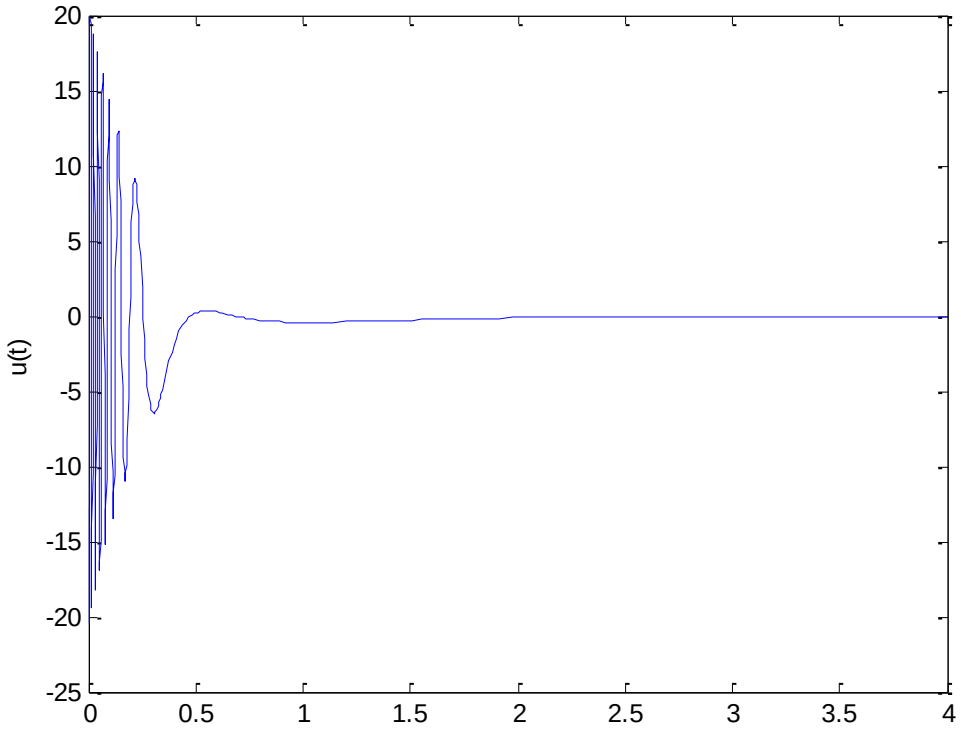

Figure 3: Control signal of Example 1.

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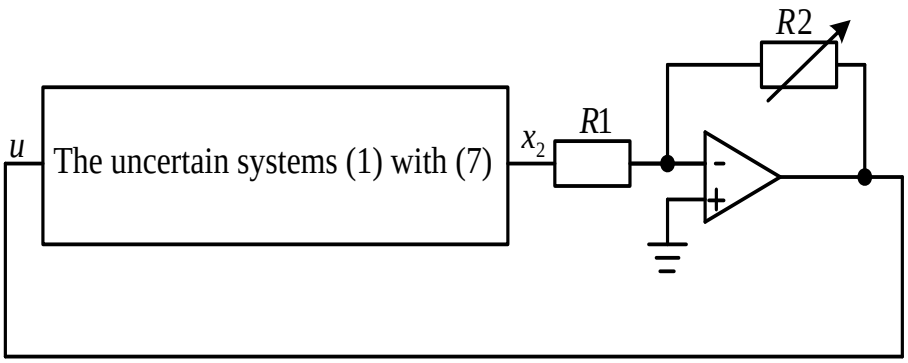

Figure 4: The diagram of implementation of Example 1, where $R1 = 3k\Omega, \quad R2 = 19k\Omega.$

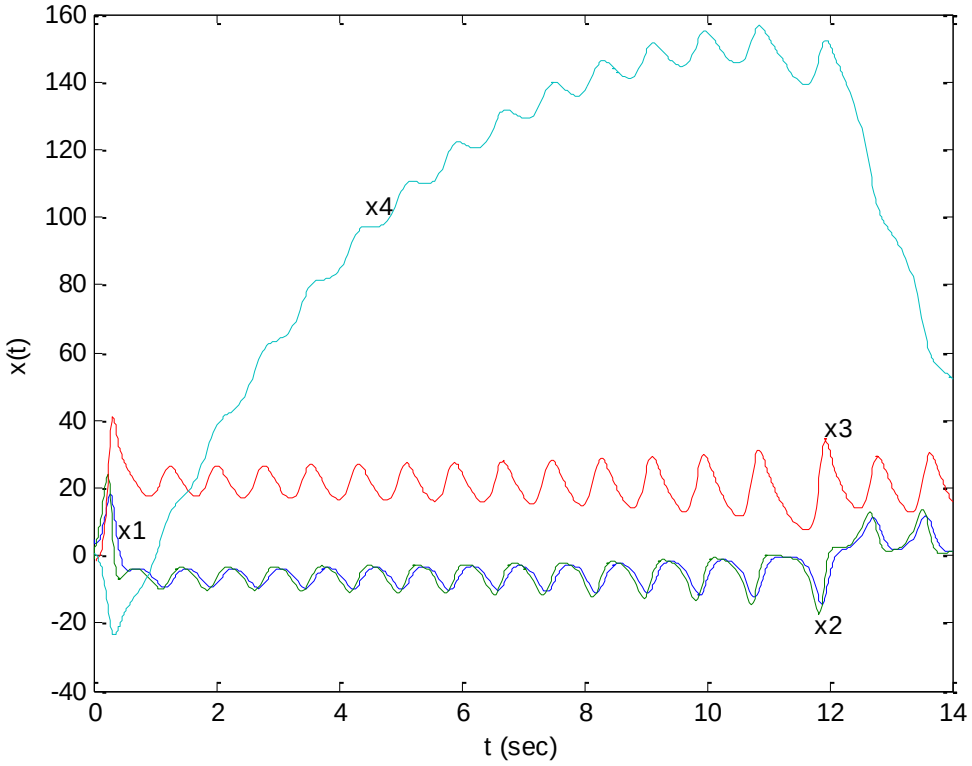

Figure 5: Typical state trajectories of the uncontrolled system of Example 2.

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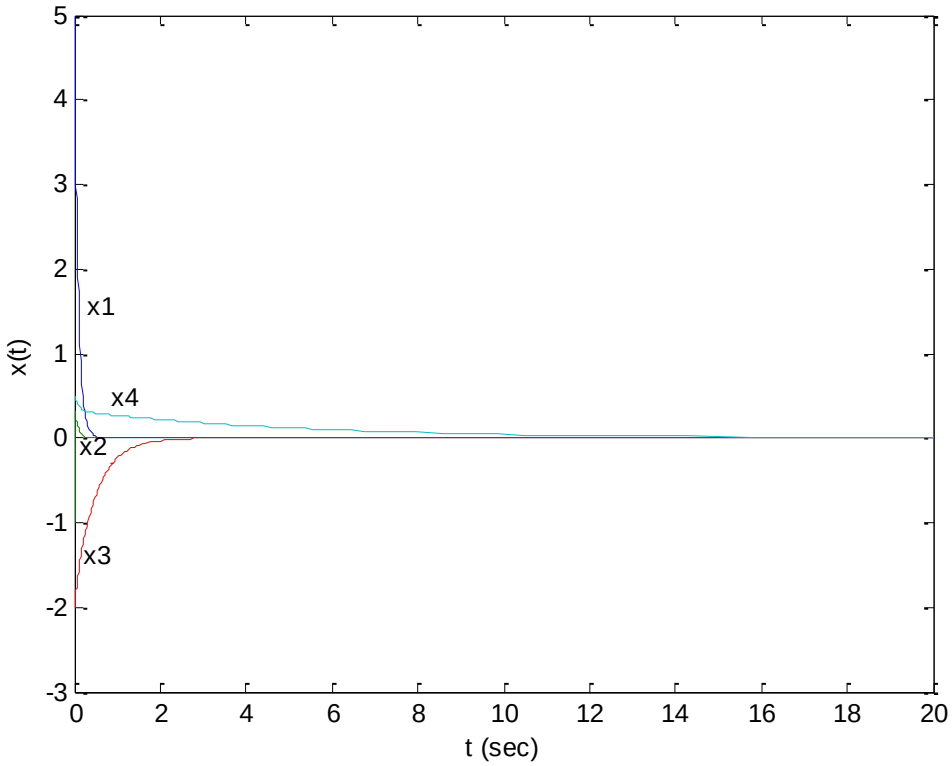

Figure 6: Typical state trajectories of the feedback-controlled system of Example 2.

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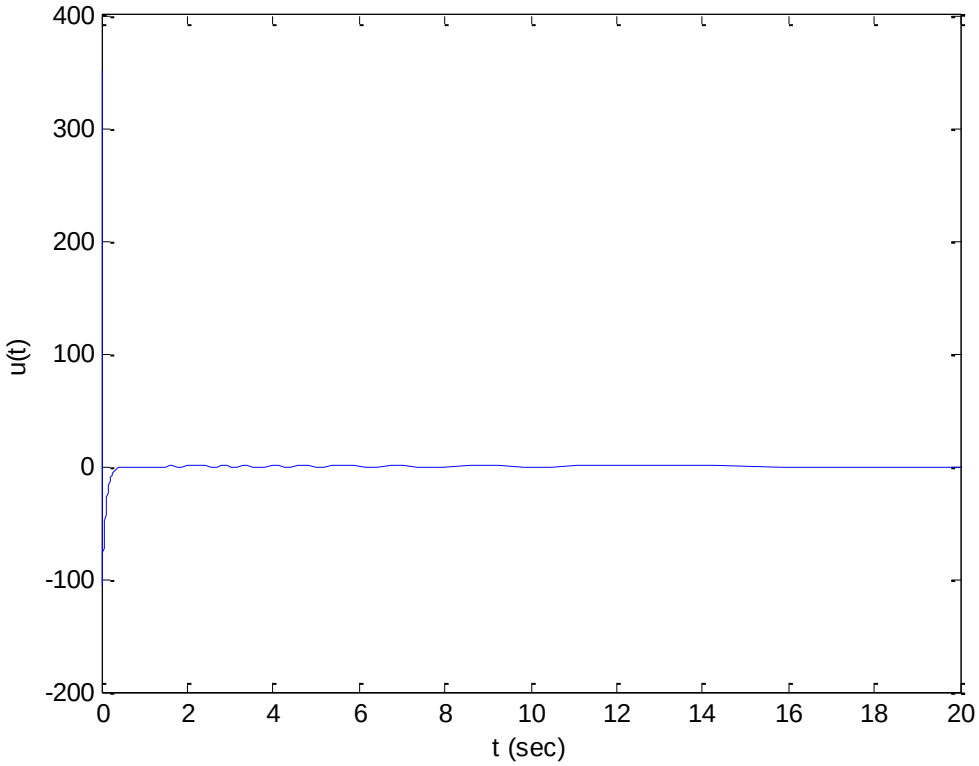

Figure 7: Control signal of Example 2.

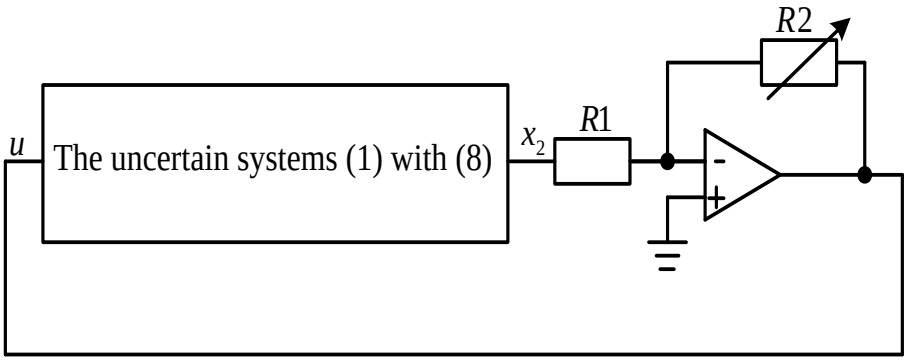

Figure 8: The diagram of implementation of Example 2, where $R1 = 1k\Omega, \quad R2 = 351k\Omega.$

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THE ROLE OF INNOVATION IN INCREASING THE EFFICIENCY OF THE HIGHER EDUCATION SYSTEM

Babaeva N.M.
PhD., Associate Professor,Kokand State Pedagogical Institute

ABSTRACT
Opinions were expressed on the role of innovative activities in improving the quality of the education system, especially the higher education system, and the role of pedagogical innovations in the development of the higher education system of the Republic of Uzbekistan, scientific proposals and recommendations were presented.
KEY WORDS: *Innovation, education, economy, information and communication, technology.*

From an economic point of view, the issue of studying the international experience of organizing and supporting innovative activities in the experience of developed countries in the context of modern globalization, digital economy and the construction of a new Uzbekistan is not only at the enterprise level, but also at the training of specialists in higher education institutions and their it also serves to improve innovation activities. From the pedagogical point of view, the innovative processes implemented in the modern education system are primarily related to the active use of digital technologies in all areas of human activity and are primarily focused on improving the quality and efficiency of education.

In our country, "educating young people who think independently, who are able to take responsibility for the future of our country, who are enterprising and enthusiastic" is defined as one of the priority directions of the development of the social sphere of our country. President Shavkat Mirziyoev said: "We all know that today is the time of high technologies and innovations. The developed countries of the world are setting themselves the task not only of producing many products and bringing them to the market, but also of transitioning to an innovative economy based on deep knowledge and scientific achievements. That is, the development of one's economy by creating innovative products, adopting and introducing advanced technologies into production, not at the expense of existing natural resources, is becoming the main factor of development..." can be known.

An important link of large-scale reforms - innovation is showing its advantages in the higher education system today, as in every field. In order to improve the higher education system, fundamentally revise the content of personnel training, and ensure the creation of the necessary conditions for the training of highly educated specialists at the level of international standards, one of the most important of the regulatory documents adopted by our government a number of tasks are defined. In particular, each higher educational institution should establish close cooperation relations with the world's leading scientific and educational institutions, use advanced pedagogical technologies, educational programs and educational programs based on international educational standards in the educational process. wide introduction of methodological materials, active involvement of highly qualified teachers and scientists from foreign partner educational institutions in educational and pedagogical activities, professional development courses, on the basis of them, higher education institutions of our republic systematically train graduate students, young teachers and organization of internships of scientific staff, retraining and professional development of professors is one of these. It can be said that these tasks require creativity and inquisitiveness from every professor. In the last years of the twentieth century, the changes that occurred in the field of education on a global scale became one

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of the main reasons for the development of "innovative" education as an alternative to education. That is why the interest and attention to increase the effectiveness of education using innovative pedagogical and information technologies in the educational process of our country is growing day by day. In this regard, the professional innovative activity of students acquires a completely different meaning.

In the Address of the President of the Republic of Uzbekistan to the Oliy Majlis, it was recognized that our country has entered the stage of innovative development in order to achieve modern progress. "Innovation is the future. We need to start building our great future... precisely on the basis of innovative ideas. It is not for nothing that we are moving to the path of innovative development and digital economy. Because who wins in today's fast-paced world? A country that relies on a new idea, a new idea, and innovation will win." Adoption of the Law of the Republic of Uzbekistan "On Innovative Activities" (July 24, 2020) in order to create the appropriate legal ground provided for in the State Program "Year of Development of Science, Enlightenment and Digital Economy" is important in building a new Uzbekistan was a step. This law is extremely important by strengthening the effective legal mechanisms for the creation and implementation of new ideas, new discoveries, scientific developments, which guarantee our progress and accelerate it.

In the literature, the term innovation is also defined as "investment in renewal", "result of practical mastering of new process, product, services", "new technique or technology", labor organization, service provision, management and other purposes. In addition, innovation is defined as the processes of creation, absorption and distribution of innovation, and the activities embodying these processes.

The realization of the need to reform and modernize the educational system in practice leads to the inevitability of including educational institutions in innovation processes, their continuous operation in the "innovation field" and, most importantly, the assimilation of certain innovations.

This is especially important for our time, because innovative activity is a condition for the survival of an educational institution, a condition for ensuring the social security of its pupils (students) and all teaching staff.

According to sociological studies, more than 90% of the world's educational institutions are currently searching for new means, methods and forms of educational activity. Many different innovative processes have been implemented in educational institutions, especially in the last decade. This is a quantitative statistic.

At the same time, qualitative analysis shows that innovation processes are often fragmented, ineffectively managed, not thought through in detail and not ready for implementation. Educational institutions undertake the development and implementation of various innovations that are not related to the life of a particular educational institution as a result of an order from above or fashion. As a result, either a traditional "action plan" or a complex "artwork" created by the leader is incomprehensible, alien to the team, and as a result, it is rejected by it. As a result, the popularity of announced innovative projects is not confirmed by the number of people who have successfully mastered this or that innovation.

One of the main reasons for this inconsistency is the lack of a management system for innovation processes in a given TM. In practice, this means that TM solves any and everyone's problems by adopting some innovations, but not its own. In addition, these problems are not always formulated rationally and clearly by the leaders of these institutions. If the innovations being created are not a means of solving certain TM problems and, as a result, a way to develop them, they will not be needed for the educational organization. Currently, the teachers themselves ignore the issues that should be worked on in TM. One of the renewal needs of many teachers is their desire to try new approaches, ways of working and provide interesting teaching for young people, rather than solving the significant problems that hinder the development and progress of TM.

Today, innovative changes in various fields, such as the formation of new content of education: formation of new content of education, development and introduction of new technologies of teaching; use methods, methods, and tools of mastering new programs; creating conditions for self-awareness of the person during the training process; changes

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in the way of activity and thinking of both the teacher and the students, the change of relations between them, the creation of creative and innovative teams, schools, and higher educational institutions are being implemented.

The study of innovative processes in education reveals a number of theoretical and methodological problems: the relationship between tradition and innovation, the content and stages of the innovation cycle, the attitude of various subjects of education to innovation, innovation management, personnel training , criteria for evaluating innovation in education, etc. These problems should be considered at another level, from a methodological point of view. Therefore, it is important to justify the methodological basis of pedagogical innovation no less than to create innovation.

Also, there is a growing need for a new theoretical understanding of the essence of the management of innovative processes in an educational institution, and the development of pedagogical conditions that ensure continuous innovative activity. In addition, it is important that innovative processes require special training for qualified personnel in the field of pedagogical innovations - teachers, administrators, educational managers.

In conclusion, it should be noted that the development of the society is measured not only by the high economic potential of the country, but also by the extent to which this potential is directed to the maturation and harmonious development of each person, and the implementation of innovations. Therefore, increasing the efficiency of the educational system, equipping students with modern knowledge and practical skills and qualifications, studying foreign best practices and applying them to educational practice is an urgent task of today.

The changes taking place in all spheres of our society (economic, social, political, cultural) cannot but affect the educational system, which determines the future intellectual potential of the country and is a condition for its prosperity and development. For this reason, the innovative activities of educational institutions have an important place as one of the strategic directions of education.

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THE ROLE OF GLOBAL POLITICAL TECHNOLOGIES IN INTERNET NETWORKS

Sh.A.Makhmudov
Scientific Researcher, Samarkand State University, Uzbekistan

ANNOTATION
The article highlights the processes of development of social networks as global political technologies and discloses their features with examples.
KEY WORDS: *political technologies, social networks, election technologies, virtual space, "soft power", manipulation technologies.*

Today's stage of the development of society and statehood cannot be imagined without modern Internet communication technologies. In recent years, the global Internet network, in particular social networks, has begun to have a solid place in the political environment and processes, along with all aspects of public life.

The development of social networks at the global level is directly related to the following factors:

first, according to the report "Global Digital 2019" [1], the total number of users of social networks in the world is 3.48 billion reaching man, it is 42% of the world's population. The growth rate is almost 9% (288 million) compared to the previous year. In this regard, the share of the regions of North America and Western Europe, respectively. The total number of Internet users in our republic in 2020 amounted to 20 million makes up more than a person.

Secondly, it is no exaggeration to say that social networks are becoming a global political technology for influencing national, regional or international processes in most western, as well as developed eastern (referring to Asian Tigers) countries. Because, in these countries, almost all members of the intelligent layer began to carry out their relationship in the virtual world.

Thirdly, the development of information technology gave rise to the concept of "network generation"[2], which in itself has a high level of informational literacy and reflects today's younger generation, who is constantly actively using modern information and communication technologies in their daily lives.

The fact that these factors are used as a means of achieving political goals on a global scale of social networks becomes the basis for its calculation as a global political technology.

Based on the communicative function of social networks, it can be observed that their audience is expanding. Instagram, Facebook, Twitter, Instagram, Vkontakte, Odnoklassniki are currently popular among users of such social networks as Facebook, Twitter, and Odnoklassniki, and the general public is not at all likely to fall under the influence of various manipulation technologies in the cliff of receiving such a large amount of information.

Political Scientist M.Demetradze believes that "social networks, manifested as a new instrument of influence in world politics, began to demand, without words, deep analysis and attention in the process of state decision-making, especially their effective use, in the context of the intensification of global problems and the growing international interdependence" [3].

In the words of sociologist scientist M.Castels, "due to the globalization of the information space, social networks, considered one of the new forms of communication during the decision-making of the information society, are a new means of democratizing world society, while there is an additional mechanism for influencing political

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processes in the country and the world. Social networks also emerged as a new actor in the landscape of world politics" [4].

In recent years, the importance of social networks in political processes has increased in developed (as well as some developing) countries of the world and the cases of its use for political purposes have taken on almost the same appearance. So there is no mistake if they are recognized as a form of global political technology.

The virtualization of the activities of the institutions of mass democracy – elections, state and political parties - has turned the Internet, including social networks, into a tool and field of political struggle [5].

In a situation where "digital diplomacy" is developing among the subjects of international relations, the role of social networks as a global political technology has also begun to be observed in the global behavior of the leaders of certain states.

Facebook is a social network that has been used by most political leaders such as Twitter or Facebook, and the term Twitter diplomacy or Facebook diplomacy has begun to be used among the general public in relation to these processes.

Political events and phenomena that have taken place in the world's political arena are immediately reflected in social networks and are turning into political discussions. Social networks are becoming politicized, especially since social networks have become one of the most important tools in the implementation of the foreign policy of some leading states. All political struggles of national and international importance are mainly aimed at gaining public consciousness, mainly taking place on social networks.

The role of social networks as global political technology can be seen in the fact that political figures begin to actively use the capabilities of social networks to promote their views (goals) in a certain audience of people [6].

In this case, the active influence of social networks on international political processes can be explained in connection with the phenomenon of "policy emotionalization". Experts believe that this trend is expressed in the fact that in political dialogues the content of rational arguments is mixed with emotional (emotional) elements. In particular, recent elections in the United States have shown that the political sentiment reflected in social networks is one of the important factors that can seriously affect voters.

In the 2016 presidential election, D.Trump wrote messages on his Twitter page in an extremely impulsive way, using initials of various references, a situation that caused his correspondence to be emotionally stained and, due to this, his messages to have a "more lively" effect on the correspondence of other politicians, the user of social networks [7].

At this point, it is worth saying that according to experts, today "Twitter" is a microblogging platform consisting of short replicas, phrases, quick comments (comments), images or notes that contain links, in which the character of impulsiveness (responsiveness) is stronger than in other social networks. According to the researchers, it turned out that through reposts on social networks, information with negative value spreads faster and more efficiently than messages of a positive nature that express laughter, fear, sadness or sadness and enthusiasm that evoke a strong emotion in oneself [8].

In this regard, the US President D.Trump's constant negative opinions (posts) about Iran, Venezuela or North Korea through the social network Twitter, of course, do not show their influence on the foreign policy of most countries in the direction of the listed countries.

Another interesting aspect of this situation is that only one negative post left by the US leader on Twitter can seriously affect not only interstate political relations, the world economy (banking and finance, the oil market, etc.).

In recent times, the fact that fake (false) information has been disseminated on social networks has had its serious impact not only on any social relationship, but also on political processes in the international arena.

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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Especially, there are more and more cases of using such news in the way of achieving its political goals. So, summing up, it is possible to attribute one confirmation to the interpretation of social networks as a global political technology – the popularity of their distribution of fake news.

According to the "Buzz Feed News" agency, Facebook news will be even more distributed in the last period of the election race and will be able to awaken a very active influence among the use of the Facebook social network [9].

Social networks are used in political processes not only for positive purposes, but also for the protection of certain destructive forces (terrorist and extremist organizations, illegal opposition, etc.) there are also cases of their use in the implementation of their own selfish political goals. That is, they are using social networks to promote and promote their ideology.

Most experts in this regard say that in the future, it is far from the fact that social networks will move to the virtual world full of real politics in world countries. In such processes as the migration of political processes into the virtual world, that is, increasing the political consciousness and culture of citizens, including the ability to select and analyze information, becomes of urgent importance.

Social networks themselves are considered an integral part of the globalization process, and in the present period, its peculiarities are studied by various research centers. For example, in 1977, in Delaware, USA, "*The International Network of Social Network Analysts"* (INSNA) was founded, which operates as a professional non-profit association of scientific researchers engaged in the analysis of issues related to social networks [10].

As we will see on the example of the Asian region, currently the Yokogama National University of Japan has a training course entitled "globalization of social networks", which, on the basis of orders, conducts scientific research and research on most problems related to the activities of social networks (both national and world policy).

At this point, it should be noted that today there is a globalization of the political-communication space. There is an increase in the role of the information factor in solving global geopolitical tasks. Social networks serve as a tool in the implementation of one of the global political technologies, the "soft power".

Researcher V.Zapryagaylo assesses social networks as an effective instrument for mobilization in mass movements, recognizing its role as being considered a positive "soft power" and giving the opportunity to bring it closer directly to democracy [11].

Based on the above, in place of the final sentence, it can be noted that social networks, as a global political instrument, are becoming an integral part of the geopolitical concept of "soft power", which is able to influence most (including important) processes taking place in world politics.

As a conclusion, it is worth noting that the use of social networks as global political technologies will develop further. In this case, it is appropriate to highlight such as following after certain ideas and ideologies, organizing mass protests, carrying out mass manipulations.

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EPRA International Journal of Research and Development (IJRD)
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EDUCATION OF THE FOUNDATIONS OF FAITH IN THE MOTHERLAND AND MILITARY EDUCATION IN CHILDREN OF PRESCHOOL EDUCATION ORGANIZATION AS A SCIENTIFIC PROBLEM

Abdullaeva Masuda. Abdubannaevna[1], Nishonova Aziza Mirzakhmadova[2]
[1]*Candidate of Pedagogical Sciences, Associate Professor, Namangan State University*
[2]*Doctoral Student, Namangan State University*

ANNOTATION
The article examines the theoretical foundations of the spiritual and moral education of preschool children, reveals the essence of the concept of homeland, faith, spiritual development of the individual. The article is devoted to the study of the problem of upbringing of spirituality and morality in folk pedagogy, increasing the effectiveness of moral education among the younger generation, which provided an opportunity to join the culture of their people and universal values.
KEYWORDS: *Homeland, faith, spiritual development, moral education, worldview, morality, folk pedagogy, universal values.*

In recent years, as a result of the reforms, many positive changes have been made in the field of education, our nationality has been restored, and new pages of our material and spiritual values have been opened. At the same time, our government and people realized that the study of our past cultural heritage is one of the urgent issues necessary for the development of society and science. Of these, the cultural heritage left by our ancestors and the Uzbek people's pedagogy contain wonderful, progressive ideas that will be needed for all times.

First President I.A. Karimov, who defined the meaning and direction of our work in the field of spirituality, said that only a person who knows how to put the honor of the country above everything else, who is proud of his language, religion, history, and national values, can make a worthy contribution to the development of Uzbekistan. , humanitarian feelings are an age-old trait ingrained in the blood of our people. "The issue of carefully preserving and further improving these unique human qualities, raising our children as worthy sons and daughters of a free and democratic Uzbekistan, should be the main direction of our work in the field of spirituality," he said.

For the same reason, it is the demand of the time to conduct scientific research and research in order to create the theoretical foundations of raising the foundations of faith in the motherland in preschool children by increasing the educational influence of our national values. One of the most valued feelings in human spirituality is faith in the motherland. Before talking about faith in the motherland, patriotism, it is necessary to have a complete idea of the meaning and essence of the concepts of "motherland", "patriotism" and "faith".

If we talk about the scientific, pedagogical, philosophical, artistic aspects of the concept of homeland, the concept of homeland is defined as follows in the "Explanatory Dictionary of the Uzbek Language" published in 1981: the country where a person was born and raised and considers himself a citizen; country, city or village where a person was born and raised; it is interpreted as residence, shelter, abode, house.

In the national encyclopedia of Uzbekistan, the concept of homeland is given as follows: homeland - the place where people were born and raised, land, country; a territory historically belonging to a specific nation and its nature, population, unique development, language, culture, life and traditions. Motherland is as sacred as mother. A sense of

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duty and responsibility towards the motherland is characteristic of every mature person. Love of country is manifested in patriotism.

Looking at these definitions, it can be observed that the two definitions are quite different from each other. The first definition allows for some generality; and in the second definition, it is approached in a more specific way, that is, it is said that it consists of the territory historically belonging to a certain nation and its nature, population, unique development, language, culture, life and traditions.

Indeed, the motherland is not the property of one person, it is the land of our ancestors, our growing children, the property of future generations - the motherland is the property of each of us living in this country. So, as long as there is a homeland for the nation on earth, the feeling of homeland will always exist in the people, in all eras.

Scientist Ulfat Mahkamov expresses the concept of homeland in the book "Ethical Lessons" as follows: "The homeland is reflected in the attitude of each person to his home, the country where he was born and raised, his closest people, parents, brothers, and sisters. Motherland is such a concept that never changes in a person's heart. The feeling of love for the country enters the blood with mother's milk. Mother takes care of this dear feeling and brings it to adulthood.

Speaking about the feeling of homeland, we would like to emphasize that it is a psychological feeling that exists in a person. When studying the concept of homeland from a pedagogical point of view, it is necessary to approach it from the point of view of thinking from the generality to the particularity of the cognitive activity existing in a person: therefore, the homeland is a general concept - it is the place of the earth for humanity; The emergence of a nation and which nation considers which place as homeland is the way to know.

Summarizing the above comments, analyzing and interpreting them, we tried to express our thoughts and views in a way that is understandable to the children of the preschool education organization.

Motherland is the land where we are born and grow up; these are the values we hold dear; this is our hardworking people, neighborhood, family, neighbors; this is our beloved Uzbekistan inherited from our ancestors.

It is necessary to understand the meaning and essence of the concept of "patriotism", taking into account that the words homeland, patriotism, faith in the homeland always complement and express each other. In the "National Encyclopedia of Uzbekistan", patriotism is a concept that expresses people's love and loyalty to their motherland. Patriotism is one of the universal feelings and moral values that have been refined over the centuries, common to all peoples, peoples, and nations. Historically, patriotism is also a set of feelings that have been developed in the process of social development of people related to the fate of their homeland, the struggle of people for the integrity and independence of the territory where they live. This is manifested in pride in the past and present of the homeland, in protecting its interests.

Belief in the motherland, serving for the development of the country, sacrificing one's life for the country if necessary is one of the ancient beliefs of our people. Therefore, the main task of pedagogical activity is to raise strong faith in children of preschool educational organization. In this regard, it is appropriate to dwell on the concept of faith, which will help clarify the concept of faith to the homeland.

Faith is one of the highest peaks of human spirituality, and creating its foundations from childhood is equivalent to educating people with healthy beliefs. As we aim to educate people who believe in the motherland, we will dwell on scientific ideas about the concept of faith.

In conclusion, the idea of faith in the homeland is ancient and eternal in Central Asia. Ancient writings, folklore and literature, works of great scholars and philosophical views are a clear proof of our opinion.

Since the feeling of homeland is a sacred feeling, our people have preserved this feeling for centuries. This feeling has always united them towards a cause, led them to great struggles and indomitable courage, made them indomitable in front of the enemy, and led them to shout victory. Our nation has always been a supporter of peace and harmony.

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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THE STATE OF AGRICULTURE IN THE FERGANA ECONOMIC REGION IN THE 50S-80S OF THE XX TH CENTURY

Gullola T. Yusupova
Lecturer,Department of "History",Kokan State Pedagogical Institute

ABSTRACT
In this article, the state of agriculture in the Fergana economic region in the 50s-80s of the 20th century and the consequences of the agrarian policy conducted by the Soviet government in it are revealed based on the analysis of periodical sources and literature and research works on the subject. Also, after the Second World War, the policy of the Soviet government to develop cotton farming in the Ferghana economic region, to have more cotton harvest, to meet the cotton needs of the light industries in the center, to develop new land in the country and to specialize in cotton production. and implications are covered.
KEYWORDS: *Uzbek SSR, Fergana Valley, Soviet Union, national economy, economic region, cotton, agriculture, irrigation-reclamation, state farms, kolkhoz.*

INTRODUCTION

From the middle of the XXth century, special attention was paid to the issue of further development of agriculture in connection with the transition of the Soviet government to peaceful construction works throughout the country, in particular, in the territory of the Uzbekistan SSR. As a result, as in other regions of the republic, in the Fergana Valley, new land development was started. From the center of the Union, at the congresses and plenums of the CPSU (Communist Party of the Soviet Union), the task of acquiring new lands was determined, including the acceleration of regular land acquisition in the five-year plans [9, – 635 p.]. In the five-year plans of 1946-1950, the main task of agriculture was to carry out irrigation-reclamation works in irrigated agricultural regions. In the process of ensuring the implementation of these tasks, the works on the completion of the construction of the Sarisuy, Bagdad and Soz-Isfara collectors system and the construction of other collectors and irrigation stations in the economic regions of Fergana were accelerated. For example, in the twelfth five-year plans, it was determined to allocate more capital funds for the development of cotton, effective use of available production resources, increase productivity, improve fiber quality, and wide use of scientific and technical progress.

During this period, cotton was a valuable raw material in the economic life of the country, and about 300 different products were produced from it. On average, 30–35 kg of industrially needed fiber was obtained from every 100 kg of cotton. About 3000 meters of fabric was obtained as a result of processing this fiber in textile enterprises. 6–8 kg of lint, 11–12 kg of oil, 2.5 kg of soap and other products were obtained from 100 kg of cotton [1, – 3 p.].

THE MAIN FINDINGS AND RESULTS

In the 1950s, the "Ferganavodstroy", "Andijanvodstroy", "Namanganvodstroy" trusts were established in the Fergana economic region. From 1953 to 1973, only "Ferganavodstroy" and the newly formed inter-collective collective farm council took part in the acquisition of more than 50 thousand hectares of new land and the establishment of 3 state farms and 5 collective farms on these lands [15, – 95 p.]. Due to the fact that the favorable climate of the provinces in the Fergana economic region and the sufficient labor resources allowed to accelerate the development of land, on October 20, 1953, the Central Committee of the Central Committee of the Communist Party of Uzbekistan and the Council of Ministers of the Uzbek SSR "Expansion of irrigated lands and water management in the Uzbek SSR" the decision on further development measures", resolution of the Council of Ministers of the USSR "On the further development of cotton production in the Uzbek SSR in 1954-1958" (February 9, 1954), The order of the Ministry of Agriculture of the Uzbek SSR "On strengthening the irrigation and development of the lands of Central Fergana", the decision of the Council of Ministers of the Uzbek SSR "On the development of new and reserve (waste) land for the harvest of 1958" (March 18, 1958), the decision of the Central Committee of the Central Committee of Uzbekistan and the Council of Ministers of the Uzbek SSR "On strengthening the work on irrigation and development of new and reserve land in Central Ferghana" " decision (April 21, 1958), Decision of the Council of Ministers of the Central Committee of the CC of Uzbekistan and the Council of Ministers of the SSR of Uzbekistan "On approval of the program of construction work on

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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irrigation and development of Central Fergana lands in 1959" (January 23, 1959), the decision of the Central Committee of the Central Committee of the Republic of Uzbekistan and the Council of Ministers of the Uzbek SSR "On irrigation and development of reserve and gray lands in Central Fergana in 1959-1965" (August 3, 1959), "Construction work on irrigation and development of Central Fergana lands in 1960" of the "Ministry of Water Management of the Uzbek SSR program" (March 18, 1960), on the basis of decisions and orders of the Central Committee of the Central Committee of the Republic of Uzbekistan and the Council of Ministers of the Uzbek SSR "On the development of protected lands in Central Fergana" (May 12, 1961), 60 thousand hectares of protected land were developed in Central Fergana until 1963 [8, – 173 p].

Activities in this regard, of course, also affected land reclamation and irrigation works. "Ferganavodstroy", "Andijanvodstroy" and "Namanganvodstroy" trusts established in the Fergana valley, as well as the regional irrigation departments, during 19 years (between 1953 and 1972) carried out earth excavation and concrete and reinforced concrete works in the volume of 1634039 m³, of which 650526 m³ in Fergana, 833821 m³ corresponded to Andijan, 149692 m³ to Namangan region [7, – 173 p.]. At the same time, allocation of capital funds from the state budget and the indivisible fund of collective farms for the development of reserves and gray lands in this economic region has been increasing year by year. Districts, settlements, and residential buildings rose in the newly opened areas. However, the new lands in these areas were not exploited on scientific grounds and the establishment of large cotton fields in their place, the use of toxic chemicals to increase the yield of cotton, led to the destruction of the ecology and environment. At this point, it should be noted that during this period, ¾ of the republic's agricultural output fell on farming, and the rest fell on livestock [2, – 14 p.].

The increase in cotton cultivation in many cotton-growing districts and state farms in the Fergana economic region indicates that the center has strengthened the practice of cotton monopoly here as well. At that time, cotton was the main crop of the republic's agriculture, and Uzbekistan was in the first place in the Union in terms of cotton cultivation, supplying 64.1% of the cotton of the USSR. Also, according to historical scientists, the development of brownfields is a clear expression of the extensive development model of the field, and it was not scientifically approached in depth. The constant expansion of cotton planting areas by the political leadership of the USSR, and the careless attitude towards environmental disasters that could be caused by the massive construction of water reservoirs on rivers for irrigation purposes deepened the current situation [13, – 132 p.].

During the years under review, the policy of economic regionalization of the Soviet state continued, and in this process reforms were also carried out in agriculture. As a result of the activities of the Central Committee of the Communist Party of the Communist Party of the Soviet Union (CPSU) and the Soviet of Ministers of the USSR on the transfer of state farms completely to the farm account, by July 1, 1967, a small group of state farms in Uzbekistan itself was transferred to the farm account. In this process, in 1957-1960, 84 large specialized state farms were established across the republic at the expense of farms with low economic growth. Mainly, problems such as the poor land reclamation condition in the farms located in the Kokan zone of the region, poor quality of salt washing once a year caused the quality of cultivated products to decrease. For example, in "Nayman" state farm, soil salinity was very high compared to other regions [5, – p. 66.].

At this point, it should be noted that in order to increase productivity in the newly established state farms, special attention was paid to strengthening their material and technical base, and funds were regularly allocated by the state. In 1963, the effectiveness of these established state farms was reviewed at a meeting of the Central Asian Agricultural Institute. It was noted at the meeting that these established state farms managed to deliver 74,000 tons of cotton. It was necessary to keep an accurate account of the funds allocated for production in the state farms transferred to the economic account, to ensure the equal development of all branches of agriculture. However, in the 1960s, 71 state farms in the republic ended the year with 13 million rubles, while 50 farms underperformed the set plan by 8.6 million rubles and faced significant financial problems. In Fergana, there are state farms that have been operating at a loss for many years, and only Sokh state farm ended the year with a loss of more than one million rubles instead of the set income of 304,000 thousand rubles [6, – p. 64.].

Such shortcomings are characteristic of other regions as well. In 1967, due to the inability to properly use the resources for the development of production, the existing state farms in the republic handed over the products that should be handed over to the state in the amount of 7 million rubles. One of the main reasons for such shortcomings was that the farms spent too much money on administrative work. According to statistics, in 1967, 544,000 rubles were spent from the monthly salary fund of state farms. In order to prevent these shortcomings, it was determined that state farms should be transferred to the farm account, and short-term and long-term loans from banks should be established. State farms that received loans were supposed to serve the development of all branches of agriculture. "Savai" state farm in Andijan region, which is part of the Fergana economic region, was also transferred to the account of such a farm. According to the end of 1967, this state farm paid off its loans from the bank and produced an additional product of 514 thousand rubles beyond the plan [6, – p. 65.]

In the analyzed years, cotton raw materials made up most of the products transported from the Fergana economic region. Cotton fiber was sent to textile factories in the center, West-North, Siberia, Ukraine, Volgaboyi, Kazakhstan and other regions. Large quantities of vegetable oil, fruit, silk gauze, ozokerite, viscose, kirza, belts for driving machines, diesels, pumps were transported[3].

Even in the cotton sector, following the prescribed plan has led to vices such as overwriting in the sector. At the same time, the lack of material interests among people has increased the cases of irresponsibility in their work. The cotton fields of

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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Uzbekistan, as well as all cotton farms in the Ferghana Valley, had many deficiencies. One of the main ways to use labor force in the rapidly growing republic was the development of cotton growing, as it takes 39 man-hours to grow one centner of cotton and 6.8 man-hours to grow one centner of grain, that is, 6 times less labor in the state farms of the republic [10, - p. 10.]. However, people's irresponsibility, lack of material benefit from their work, successive plans, naturally remained one of the main obstacles to development.

Although field work is done quickly in the cotton fields, the quality of the work is not fully paid attention to, when the fields are plowed, the fields are not cleared of last year's cotton stalks, and in some places, stones. For example, in the collective farms named after Okhunboboev, Hamza Hakimzoda, Fergana district, Vodil district, and "Yosh Leninchi" in Fergana district, no attention was paid to the straightness of the rows when sowing seeds. In Tasloq, Altiariq, Chinabad districts and several other places, although land softening (cultivation) was demanded, the tractor cultivation was carried out very slowly. In addition, in Andijan and Namangan regions, work on cotton fields was not carried out on time [12]. Chasing the number of seeds only as a result of actions towards the implementation of the given plan, the seeds sown were not processed in time [11]. The strict requirement to fulfill the given plan, pomposity, lofty slogans created the conditions to chase after the quantity, not the quality of the product.

In 1951, in the discussion of the results of the investigation carried out by the Bureau of the Central Committee of the CP(b) of Uzbekistan, it was noted that "the Kaganovich district party committee of Fergana region did not ensure the implementation of the decision of the IX plenum of the Central Committee of the CP(b) of Uzbekistan" "On harvesting and preparing the cotton harvest of 1951". According to the decision, "... the district party committee did not take measures to strengthen cotton harvesting and preparation, as a result, instead of handing over 14.4% of the annual plan to the state, only 8.4% of cotton was handed over to the state in the last five days of September. As a result of the fact that the district party committee allegedly carried out all the work in the field of organizing cotton production with wrong methods, instead of conducting mass-political work among collective farmers and expanding socialist competition, they engaged in administration, several primary party organizations in the collective farm stayed away from cotton production and did not organize in this work, labor it was noted that they did not fight to strengthen discipline and increase labor productivity of collective farmers. As in all regions of Uzbekistan, men rarely go to the cotton fields here, they are mainly engaged in "second-level" jobs, the pickers did not fulfill the set norms, no measures were taken against those who violated labor discipline, hot meals were not provided to the pickers, advance payments were not provided on time. it was noted that there was no control, even that the collective farmers did not receive 1 million 220 thousand soums of salary for the working days of the previous years. In the 1951 harvest season, 313 cotton picking machines were idle in the province under various excuses. As a matter of fact, these circumstances were connected with the poor organization of mass-political work in the collective farms at that time. Even in 1951, a series of measures aimed at improving mass-political work among the growers were determined[15]. In general, since the 1950s, administrative-commandism has been the basis of the Soviet government's management, which has led to negative situations such as management of work, overexploitation of rural resources.

In the researched years, several plans and scientific hypotheses were developed for the further development of cotton cultivation, and Fergana economic region was lagging behind in terms of applying local fertilizers to crops in agriculture over the years. By November 1970, in the period between the completion of the assigned tasks and the development of his scientific projects, there was a need to improve irrigation channels on 948,200 hectares, to improve and build ditches on 787,200 hectares, and to build capital on 989,300 hectares. it was decided to carry out the work. There is a need to improve land reclamation of about 1,400,000 hectares of land in the republic. As a result, 6-7 centners of cotton was harvested less per year, more than 37 percent of the irrigated lands in the republic became saline, and 400-500 thousand tons less per year was harvested due to salinity [4, - p. 28.]. In the Fergana economic region, the total salinized land in this period was 12 percent in Namangan region, 21.7 percent in Andijan region, and 51.7 percent in Fergana region [4, - p. 28-29.].

CONCLUSION

In short, after the end of the Second World War, the Soviet government paid special attention to the issue of further development of the national economy of Uzbekistan, especially in the Fergana economic region. As a result, as well as other regions of the republic, the development of new lands in the Fergana Valley was accelerated. He implemented unscientific programs in order to get more profit in the newly opened areas. As a result of excessive planting of cotton in this economic region and wrong measures, the conditions of land salinization have increased. As a result, such conditions did not allow to obtain expected results in agriculture or led to low yields. As a result of disorganized and improper development of new lands in a short period of time, Fergana Economic Region has caused several problems in agriculture.

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EPRA International Journal of Research and Development (IJRD)
Volume: 7 | Issue: 12 | December 2022 - Peer Reviewed Journal

A STRUCTURAL EQUATION MODEL ON THE JOB PERFORMANCE OF EMPLOYEES IN A NATIONAL GOVERNMENT AGENCY IN REGION XI

Maribel Palma-Alicer[1], Victoria Onyot Ligan[2], Alberto N. Bandiola[3]

[1]CE, DPA, Director III, Assistant Regional Director (ARD) for Special Concerns, Department of Environment and Natural Resources (DENR) XI, Davao del Sur
University of Mindanao Professional Schools, Davao City, Philippines

[2]DPA, CHRA, Research and Development Director, Joji Ilagan International Schools, D. C.
Professor, Davao del Sur State College, Matti, Digos City, Davao del Sur, Philippines
https://orcid.org/0000-0002-8946-6135

[3]DPA, Professor, Professional Schools, University of Mindanao, Davao City, Philippines,
Provincial Environment and Natural Resources Officer (PENRO), DENR, Davao del Sur

Article DOI: https://doi.org/10.36713/epra12064
DOI No: 10.36713/epra12064

ABSTRACT

This study used Structural Equation Modeling (SEM), a multivariate statistical technique that combined factor analysis and multiple regression in analyzing structural relationships, to establish the best-fit structural model for job performance. 400 DENR employees selected using proportionate stratified random sampling throughout Region XI participated in the survey. Data analyses yielded these results: the statistical mean was high in all the variables. Pearson r revealed a significant and positive relationship between organizational change, organizational culture, job satisfaction (exogenous variables), and job performance (endogenous variable). Multiple regression analysis uncovered the influence of the exogenous variables on job performance at 66.3%. Moreover, SEM revealed the direct effect of organizational culture on job performance. On the other hand, the mediating role of organizational culture resulted in the indirect effect of job satisfaction and organizational change on job performance. Also, the SEM model showed that the appropriate manifest variables for predicting job performance are mission (for organizational culture), contingent rewards and fringe benefits, nature of work, a climate of change (for job satisfaction), and readiness for change (for an organizational change). These findings have implications for leadership in government agencies vis-à-vis employees' outstanding job performance.

KEYWORDS: *public administration, organizational culture, organizational change, job satisfaction, job performance, structural equation model, DENR employees*

INTRODUCTION

Poor performance of some workers in the public sector has been an issue that occupied news headlines until now [1]. As a result, bribery and corruption became rampant as clients wanted fast and efficient public service [2], [3]. Unluckily, this concern is not remote in the Philippines but is happening worldwide. For example, in Singapore and South Korea, unsatisfactory public services were due to the absence of motivational factors in the performance management system [4]. In India, the identified aspects of poor public sector performance were corruption, lack of accountability, poor incentive mechanisms, and over-sized government [5].

The State expects excellent performance from its workers. For DENR, Executive Order 192 mandated this national agency to conserve correctly, manage, develop, and use the environment and natural resources of the country [6]. However, with the problem of

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poor performance of employees, there is much doubt whether the agency could fulfill its mandate. Moreover, although other DENR offices in the country achieve much, others still need to do more, suggesting greater demand for employees to perform its directive [7].

There have been studies concerning job performance, but these studies use other variables. For example, Palma and Sepe (2017)[8] conducted a study using SEM to investigate whether public service motivation affects job satisfaction, individual outcomes, resigned satisfaction, and burnout. Likewise, Warr (2020)[9] investigated whether age predicts job performance and found that the two are unrelated. Although absenteeism and accidents are common among younger employees, older employees abandon the plan of leaving their employment. Despite the various studies on job performance [10], [11], [12], [13], [14], [15], poor performance is still a perennial problem that some companies and organizations face. Unfortunately, there is still a research gap on this topic, especially concerning DENR XI, a national government agency in the Philippines.

Therefore, this study proposed a public sector job performance model to help underperforming government agencies. Using structural equation modeling (SEM), it analyzed whether organizational change, organizational culture, and job satisfaction are predictors of job performance. Studies show that job performance improves with continuous incremental organizational change [16]. Moreover, organizational culture significantly correlates with and influences job performance [17]. Furthermore, job satisfaction predicts performance outcomes [18]. This study validates the previous individual results.

OBJECTIVES

Primarily, the purpose of this study was to establish the best-fit structural model for job performance in a national government agency using organizational change, organizational culture, and job satisfaction as exogenous variables in a structural equation modeling. Other objectives were the following:

1. To assess organizational change in a national government agency in Region XI regarding the climate of change, processes of change, and readiness for change.
2. To evaluate the organizational culture of a national government agency in Region XI regarding consistency, involvement, adaptability, and mission.
3. To appraise the job satisfaction of employees vis-à-vis supervision, pay and promotion, nature of work, contingent rewards and fringe benefits, and communication and operating conditions.
4. To ascertain the level of employees' job performance, re: output, job knowledge, work management, interpersonal relationship, and concern for the organization.
5. To determine the significant relationship between organizational change, organizational culture, job satisfaction, and performance.
6. To ascertain which among the variables significantly influence job performance.
7. To create the best-fit structural model for job performance.

Hypothesis

1. There is no significant relationship between organizational change, organizational culture, job satisfaction, and job performance.
2. Organizational change, organizational culture, and job satisfaction have no significant influence on job performance.
3. There is no best-fit structural model for job performance.

METHODS

This quantitative study examined the interrelationships of the variables, utilizing Structural Equation Modeling (SEM) to produce the best-fit model for employee satisfaction. Researchers use SEM to identify the relationships between observed and unobserved variables and provide valid results [19], [20], [21]. SEM can likewise determine causal factors between independent and dependent variables in varying scale levels via mathematical models and theories [22], [23], [24], [25]. Significantly, SEM provides consistency in research where the goodness of fit is necessary [26], [27]. Similar social sciences and public administration studies that built structural models use structural equation modeling [28], [29], [30], [31].

Furthermore, this study used mean statistics to describe the levels of the variables. Then, it also applied Pearson r to test the significance of the relationships between the variables. Finally, it employed regression analysis to determine which of the three independent variables (organizational change, organizational culture, and job satisfaction) best predicts performance. Structural equation modeling and regression analysis necessitate a standard outer loading greater than 0.70 [32], [33].

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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RESULTS AND DISCUSSION

Table 1
Organizational Change in a National Government Agency in Region XI

Indicator	Mean	SD	Descriptive Level
Climate of Change	3.64	0.55	High
Processes of Change	3.82	0.62	High
Readiness of Change	3.87	0.67	High
Overall	**3.78**	**0.55**	**High**

Table 1 presents the organizational change in DENR XI as perceived by its employees. All three indicators got high-level mean scores: climate of change (M=3.64; SD=0.55), the process of change (M=3.82; SD=0.62), and readiness of change (M=3.87; SD=0.67). The overall mean score is 3.78, with a standard deviation of 0.55. The result suggests that the respondents frequently adapt to organizational change, as evidenced by their high ratings in all three indicators.

The result signifies that those employees were ready for changes in the organization. Usually, whenever a change occurs, some resist by voicing their concerns about the change that is taking place [34]. Unfortunately, that is a regular occurrence. Those who resist have two reasons: personal attitude or unreadiness toward organizational change and intrinsic or extrinsic factors [35]. Therefore, people in the organization would resist change, especially if they did not participate in the proposed changes. Thus, to avoid resistance, there should be consultation and participation in the change dynamics [36].

Research shows that communicating the proposed organizational changes to the stakeholders would somehow solve the resistance problem [37], [38]. Moreover, communicating the change is vital because employees should understand the "hows" and "whys" of organizational change [39].

Table 2
Organizational Culture in a National Government Agency in Region XI

Indicator	Mean	SD	Descriptive Level
Consistency	3.95	0.55	High
Involvement	4.10	0.59	High
Adaptability	3.97	0.55	High
Mission	4.18	0.62	High
Overall	**4.05**	**0.54**	**High**

Table 2 presents the perception of DENR XI employees vis-à-vis the organizational culture of their agency. The overall mean score is 4.05, with a standard deviation of 0.54 and a descriptive level of high. The result denotes that respondents agree that their organization often manifests the actions/behaviors stipulated in the survey items under organizational culture. The *mission* indicator has the highest mean score of 4.18 and a standard deviation of 0.62. The standard deviation signifies that the responses were the expected ones and that they concentrated around the mean. Moreover, the other indicators of organizational culture, such as involvement (M=4.10; SD=0.59), adaptability
(M=3.97; SD=0.55), and consistency (M=3.95; SD=0.55) also have high mean scores. In other words, DENR XI employees frequently demonstrated these behaviors.

The result confirms that employees appreciated the culture within their organization, although not in all aspects. In other words, there are still some cultural aspects in the organization that leaders must revisit and improve for the good of all. Consequently, organizational culture is essential to sustainability [40] and job satisfaction [41], [42]. Simply put, employees' high rating of organizational culture conveys their job satisfaction, which can affect the organization's sustainability.

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Table 3
Job Satisfaction of Employees in a National Government Agency in Region XI

Indicator	Mean	SD	Descriptive Level
Pay and Promotion	3.97	0.81	High
Communication and Operating Conditions	4.14	0.63	High
Supervision	4.18	0.85	High
Nature of Work	4.37	0.62	Very high
Contingent Rewards and Fringe Benefits	3.90	0.72	High
Overall	**4.11**	**0.54**	**High**

Shown in Table 3 is the assessment of job satisfaction as perceived by the study's respondents, the DENR XI employees. Again, the overall high result (M=4.11; SD=0.54) suggested that respondents have frequently observed the statements given in the survey. Scrutinizing the data, only the nature of work got a very high mean score, signifying that respondents are always satisfied with their work. The result also shows that DENR XI employees are satisfied regarding pay and promotion, communication and operating conditions, supervision, contingent rewards, and fringe benefits.

Research shows that job satisfaction results in life satisfaction. Therefore, the above results suggest that employees were satisfied with their job and life, thus, performing better in their jobs [43]. For example, employees are satisfied with their job if they receive fair pay and other fringe benefits from the agency [44], [45], [46]. On the contrary, employees unsatisfied with their jobs suffer from burnout, with a higher intention to leave [47] because they want to look for high-paying jobs with fringe benefits [48]. As a result, unsatisfied employees are less committed to their organization and look for greener pastures.

Table 4
Employees' Job Performance in a National Government Agency in Region XI

Indicator	Mean	SD	Descriptive Level
Output	4.08	0.67	High
Job Knowledge	4.20	0.64	Very High
Work Management	4.18	0.64	High
Interpersonal Relationship	4.29	0.63	Very high
Concern for the Organization	4.14	0.63	High
Overall	4.18	0.56	**High**

Illustrated in Table 4 are the descriptive results of assessing the job performance of DENR XI employees. The overall job performance is high at a 4.18 mean score (SD=0.56). Although, the individual results showed two indicators with very high mean scores: job knowledge (M=4.20; SD=0.64) and interpersonal relationship (M=4.29; SD=0.63). The result for job knowledge suggests that respondent employees understand their job, know the organization's vision, mission, and objectives, are resourceful, creative, analytical, troubleshoot problems, and communicate well. Moreover, the interpersonal relationship result suggests that respondents are receptive to ideas and suggestions, manage teamwork, build linkages and networks, can lead and follow, and are motivated to work.

Research shows that job performance can significantly impact the employee, the workforce, and the institution [49]. Thus, organizations have to keep it checked at all times. In addition, other factors affect job performance, for instance, technology [50], job stress [51], and organizational commitment [52], among others. However, the high-level job performance of the DENR employees conveys that they do not have much problem with technology, job stress, and organizational commitment.

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Table 5
Relationship between the Exogenous Latent and Endogenous Latent Variables

Exogenous Variables	Endogenous Variable (Job Performance)					
	Output	Job Knowledge	Work Management	Interpersonal Relationship	Concern for the Organization	**Overall**
Organizational Culture	.840** .000	.674** .000	.639** .000	.679** .000	.717** .000	**.812** .000** **.000**
Organizational Change	.631** .000	.576** .000	.507** .000	.536** .000	.586** .000	**.648** .000** **.000**
Job Satisfaction	.567** .000	.541** .000	.462** .000	.528** .000	.521** .000	**.598** .000** **.000**

The correlation tests yielded favorable results. The test showed a significant relationship between organizational culture and job performance (R=.812), organizational culture (R=.648), job satisfaction, and job performance (R.598). All coefficients of correlation (R) are significant at $P \leq 0.01$ (**). Furthermore, the relationship between the exogenous variables and job performance was linear, positive, and significant. In other words, job performance also tends to increase whenever organizational change, organizational culture, and job satisfaction increase. This result affirmed some research findings on the significant relationship between these variables.

For example, [53] found that planned organizational change and high organizational culture drive employees toward job satisfaction and better performance. Although few challenges may occur during organizational changes, they cannot hamper employees from fulfilling their jobs because they understand the need for organizational change. Research also proves the importance of communicating possible organizational changes for employees to develop adaptive and proactive behaviors. In this way, employees can craft their job and develop change-oriented behaviors as they continue to engage in their work [54].

Moreover, job satisfaction increases the impact of organizational culture or values on employees' commitment to the organization. Employees become committed to their organization when satisfied, especially when they understand their culture [55]. Employees who understand their organization's culture tend to embrace and become attached to it.

Furthermore, [56] found a moderate relationship between job satisfaction and performance. Similarly, [57] found a significant correlation between work satisfaction and performance. In other words, employee satisfaction and job performance go together [58]. They are crucial drivers of work engagement [59].

Table 6
Influence of Organizational Culture, Organizational Change, and Job Satisfaction on Job Performance

Exogenous Variables		**Endogenous Variable** (Job Performance)			
		B	β	*t*	*Sig.*
Constant		.688		5.035	.000
Organizational Culture		.921	.880	16.603	.000
Organizational Change		-.156	-.153	-2.286	.023
Job Satisfaction		.085	.081	1.477	.141
	R	.814			
	R^2	.663			
	ΔR	.661			
	F	260.037			
	ρ	.000			

Table 6 shows the multiple linear regression analysis, illustrating the predictive value of exogenous variables on job performance. Based on the analysis, the computed R^2 of 0.663 and the adjusted R^2 value of 0.661 signifies that 66.1% to 66.3% of the variance can explain the change in job performance with the entry of organizational culture, organizational change, and job satisfaction. The significant result rejects the null hypothesis of no linear correlation between organizational culture, organizational change, and job satisfaction on the overall job performance of employees in a national government agency in Region XI.

The result of the regression analysis revealed the significant influence of organizational change, organizational culture, and job satisfaction on job performance by 66.1 to 66.3 percent. The result is congruent with some research findings that organizational

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change influences workers' behavior. On the one hand, those that do not appreciate the change resist it, affecting their job decisions. However, on the other hand, those that understand the change embrace it and perform well [53]. Therefore, researchers advised organizational leaders to communicate the planned change to avoid resistance. In this way, employees can craft their job and develop change-oriented behaviors as they continue to engage in their work [54].

Likewise, the result showed that organizational culture influences job performance by setting its values. It is the values or culture of the organization that becomes its foundation. Thus, shaping also the behaviors of every member of the organization. When the members embrace their organization's culture, they become more committed to it [55].

Significantly, job satisfaction influences job performance. There has been ample research on these topics. However, job satisfaction does not happen without underlying factors or motivations [60]. In this study, job satisfaction happened because of pay and promotion, communication and operating conditions, supervision, nature of work, and contingent rewards and fringe benefits. Others cite the work environment as a factor in job satisfaction that drives employees to perform well [61]. The results imply the significant roles of organizational change, organizational culture, and job satisfaction in employee performance.

Table 7
Values obtained for the Best-Fit Model

INDEX	CRITERION	MODEL FIT VALUE
Probability Value (P-value)	> 0.05	.055
Chi-Square/Degrees of Freedom (CMIN/DF)	0 < value < 2	1.667
Goodness of Fit Index (GFI)	> 0.95	.987
Comparative Fit Index (CFI)	> 0.95	.997
Normed Fit Index (NFI)	> 0.95	.993
Tucker-Lewis Index (TLI)	> 0.95	.992
Root Mean Square of Error Approximation (RMSEA)	< 0.05	.041
P of Close Fit (P-Close)	> 0.05	.667

In identifying the best-fitting model, all the indices included must consistently fall within the acceptable ranges. For example, the Chi-square/degrees of freedom value should be between 0 and 2, with its corresponding p-value greater or equal to 0.05. Likewise, the Root Mean Square of the Error Approximation (RMSEA) value must be less than 0.05, and its corresponding P-Close value must be greater or equal to 0.05. The other indices, such as the Normed Fit Index (NFI), Tucker-Lewis Index (TLI), Comparative Fit Index (CFI), and Goodness of Fit Index (GFI), must all be more than 0.95.

Data in Table 7 show that all values qualify the criterion indices. The Chi-square/degrees of freedom was 1.667, with a P-value of 0.667. These values indicate an excellent fit model to the data. Significantly, the RMSEA index of 0.041, with its corresponding P-close value > 0.05, reinforced the result. Similarly, other indices like NFI, TLI, and CFI were consistent with the criterion, indicating a perfect fit model.

The Model (Figure 3) is the best-fit structural model of job performance. Again, Table 7 shows that all model fit values are consistent with the required criterion values of all indices. The model (Figure 3) shows a direct relationship between organizational culture (OC) and job performance (JP), represented by a single-headed arrow from OC to JP. On the other hand, organizational change and job satisfaction (JS) indirectly correlate with job performance, as organizational culture mediates these relationships.

The model shows the manifest or observed variables under each latent variable. For example, under organizational culture is *mission*. Under job satisfaction are *contingent rewards and fringe benefits* (CRF), *nature of work* (NOW), and *pay and promotion* (PAP). The *climate of change* (COC) and *readiness for change* (RFC) for organizational change. *Output* (OUT), *work management* (WOM), and *concern for the organization* (CFO) for job performance. Moreover, the model also shows residuals represented by the symbol e among all the indicators.

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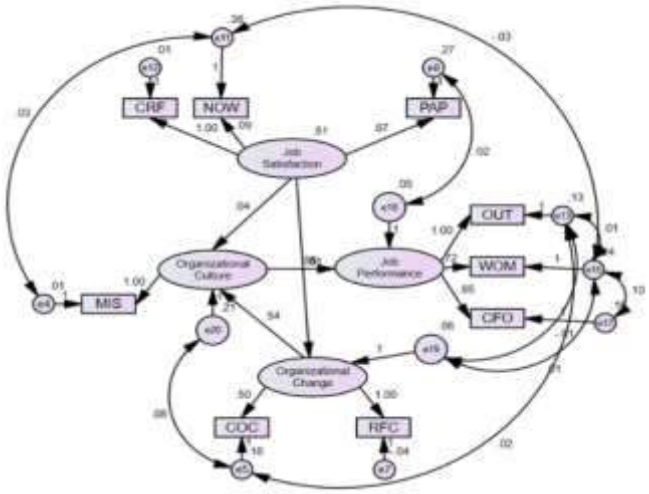

Figure 1. **The Best-Fit Structural Model for Job Performance**

Legend:

MIS-mission *PAP-pay and promotion* *OUT-output*
COC-climate of change *NOW-nature of work* *WOM-work management*
RFC-readiness for change *CRF-contingent rewards and fringe benefits* *CFO-concern for the organization*

Table 8
Estimates of Variable Regression Weights in Generated Best Fit Model

			Estimate	SE.	Beta	CR.	P-value
Organizational_Change	<---	Job_Satisfaction	.937	.914	.013	72.082	***
Organizational_Culture	<---	Organizational_Change	.615	.537	.072	7.467	***
Organizational_Culture	<---	Job_Satisfaction	.052	.044	.069	.645	.519
Job_Performance	<---	Organizational_Culture	.915	.853	.048	17.641	***
MIS	<---	Organizational_Culture	.989	1.000			
RFC	<---	Organizational_Change	1.047	1.000			
COC	<---	Organizational_Change	.635	.500	.032	15.811	***
CRF	<---	Job_Satisfaction	.994	1.000			
NOW	<---	Job_Satisfaction	.106	.093	.043	2.138	.033
PAP	<---	Job_Satisfaction	.769	.872	.037	23.520	***
OUT	<---	Job_Performance	.848	1.000			
WOM	<---	Job_Performance	.641	.718	.053	13.563	***
CFO	<---	Job_Performance	.768	.846	.049	17.183	***

Furthermore, regression weights quantified the effect between measured and latent variables. For example, table 8 presents job satisfaction as the strong predictor of organizational change (Beta estimate=0.937; P= ≤ 0.001). In turn, organizational change is also a predictor of organizational culture (Beta estimate=0.615; P= ≤ 0.001), and organizational culture is a strong predictor of job performance (Beta estimate=0.915; P= ≤ 0.001).

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The study's findings rejected the null hypothesis that there is no structural model of job performance, given the generated best-fit structural model (figure 3). Although, not all manifest variables in the hypothesized model came out as predictors because some did not meet the standard outer loading requirement of ≥ 0.70.

CONCLUSION

The study concludes that DENR XI (a national government agency in Region XI) employees are highly adaptive to the changes happening in their organization as they perceive them as part of the organizational culture, so these did not affect their satisfaction with their jobs, which remains high. In addition, there is a significant positive relationship between organizational culture, job satisfaction, organizational change, and job satisfaction. Furthermore, there is a model of job performance that shows the positive interrelatedness and interconnectedness of organizational culture, organizational change, job satisfaction, and job performance. The model suggests that organizations, not only national government agencies, must consider improving their culture by introducing positive incremental changes that would not diminish employees' job satisfaction so that they will continue to demonstrate peak performance on the job. This study's findings have implications for leadership in government agencies vis-à-vis employees' outstanding job performance.

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EPRA International Journal of Research and Development (IJRD)
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IMPROVING DATA ACCURACY IN URBAN ZONING OF AGRICULTURAL LAND

Rukhiddin A. Turaev[1], Sanjarbek Z. Safayev[2]
[1]*Director of the State Scientific-Design Institute "Uzdaverloyiha"*
[2]*Independent Researcher of the State Scientific-Design Institute "Uzdaverloyiha"*

ABSTRACT
In the development of land construction projects for the allocation of agricultural lands to the urban area, among other things, the border lines between the Tashkent region and the city of Tashkent were topographically mapped, and vector layers were developed in the form of point layers and geovisualized in a field view. The total land area of the city of Tashkent was studied using a GPS satellite wave receiver. Field research works were vectorized in a field layer consisting of a total of 784 points on the Tashkent region and 776 points on the border of the city of Tashkent.
KEYWORDS: *Land area, agricultural land, land development projects, GPS (Global Positioning System) - satellite wave receiver, electronic total station, topographic survey, point layers, vector layers, boundary lines.*

INTRODUCTION

In our republic, comprehensive measures are being implemented in connection with the rational and effective use of land resources, proper organization of land formation and land monitoring, especially the allocation of agricultural land to urban areas, and certain results are being achieved. In the development strategy of New Uzbekistan for 2022-2026, paragraph 81 defines as important strategic tasks "...revision of the boundaries of land areas and making changes". In the implementation of these tasks, among other things, it is important to create a system that has an innovative effect on the activities of land users and to constantly improve it, to allocate agricultural land to the urban area, and to conduct scientific research on ensuring the stability of the agrarian sector and the food security of the country.

THE MAIN FINDINGS AND RESULTS

Decree of the President of the Republic of Uzbekistan of June 8, 2021 № PF-6243 "On measures to ensure equality and transparency of land relations, reliable protection of land rights and their transformation into a market asset", Decision of the President of the Republic of Uzbekistan № PQ-4575 of January 28, 2020 "On measures to implement the tasks set in the strategy for the development of agriculture of the Republic of Uzbekistan for 2020-2030", This scientific article serves to a certain extent the implementation of the tasks defined by the Cabinet of Ministers of the Republic of Uzbekistan, August 27, 2021, No. 543, "Administrative regulation on the allocation of land plots for permanent use for state and public needs" and other regulatory legal documents related to this activity.

The authors carried out the field research work on the allocation of land from agricultural land for residential areas with the help of several geodetic devices. Among them, it is possible to cite electronic tachyometer, GPS (Global Positioning System) and GNSS (Global Navigation Satellite System) geodetic devices.

Field topographic research was carried out to determine the amount of agricultural land based on the rectangular coordinate system using an electronic tachyometer geodetic device. In this case, land types and boundaries of administrative-territorial units were determined. Leica TS06 brand electronic tachymeter was used in the conducted field research, and the device serves to achieve results with an accuracy of 3 seconds.

With the help of GPS geodetic device, land users and types of arable land were mapped on the basis of field layers. A Stonex R7 GPS device was used in the conducted field research, and the device serves to achieve results with an accuracy of 7 seconds.

All field surveys carried out with the help of a GNSS geodetic device were used to increase the accuracy. The GNSS device of Chckaw i-70 brand was used in the conducted field research, and the device serves to achieve results with an accuracy of 2 seconds.

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The main field work carried out in the study was topographical, taking into account the demarcation of agricultural and residential areas and the surrounding infrastructure (roads, irrigation networks, cropland, gas supply pipelines, electric power facilities and lines, and waste landfills). consists of creating a map (Fig. 1).

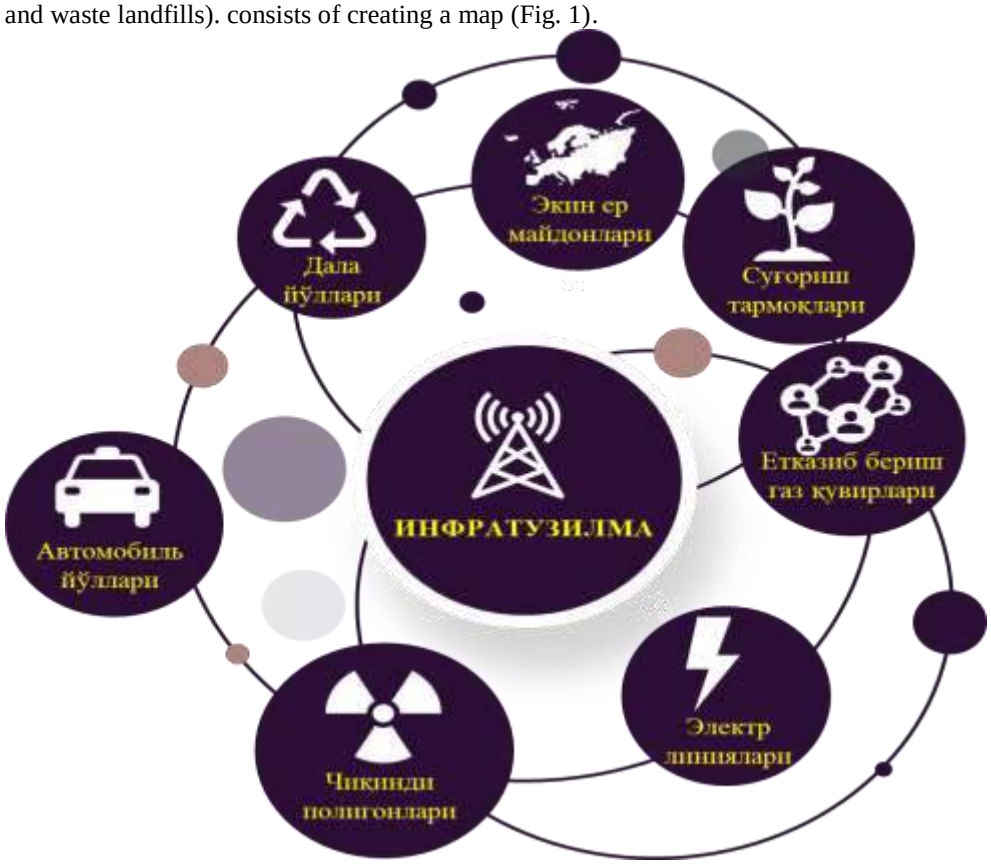

Figure 1. Scheme of consideration of infrastructure in conducting topographic field research.

Taking into account the infrastructure in the Tashkent region, the existing materials were first studied, and an outline was formed based on the information of "Openstreetmap". The formed outline was used to study the coordinates of objects on the ground in the electronic tachyometer. Field research conducted on Leica TS06 electronic tachyometer was carried out based on the following sequence:

1. In order to study the designated area from a topographical point of view, first of all, reconnaissance (surveillance and/or reconnaissance) is carried out in the area, and an outline of the area is drawn.

2. After a complete survey of the area, the most suitable place for setting up the base was chosen. Most of the area should be visible when viewed from a suitable location. The types of survey were selected depending on whether the local (conventional) coordinate system or the state coordinate system was used when setting the base.

3. After choosing a suitable place for installing the base, a tripod is installed at this point. Tacheometer is attached to the tripod using a tripod. The device is centered on the geodetic mark with the help of a laser light coming from the tachyometer. The power and memory of the device can be controlled using a special info button. Sungra circular adilak bubbles are brought to the center.

4. From the main menu, the *Management* item is selected and the *Project* line is selected, then a new project is created. From the resulting window, the project is given a name based on the topic of the work and the enter button is pressed. As a result, press the F4 button twice on the next window that appears, and the words dannyy zapisano and proekt zaregistrirovano will disappear on the display.

5. The data of this point is entered in the working window created by entering the point item from the main menu.

6. By pressing the F4 key, you will be asked to enter the data of the next point T2. If working on the basis of conditional coordinates, the point T2 is not entered and the window is exited by pressing the ESC key twice.

7. Enter the program line from the main menu, select the installation station line, and press the F4 key to save it.

8. From the next generated window, the orientation angle method was selected according to the survey method (since it is a conditional coordinate system), from the next row of stations by pressing the F2 key, the existing created point T1 in the list was downloaded using the F4 key.

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9. h instrument height is measured and entered in meters. Using the F4 key, the dalee function is executed, and the horizontal angle h is set to zero, oriented relative to the north pole or a fixed object.

10. Then, using the F2 key, the function of ustanovka is performed, and the info is displayed under the inscription station landmark ustanovlena.

11. Entering the program item from the main menu, selecting the image line, and using the F4 key, the startup operation is performed.

12. The height of the reflector from the resulting window is entered and the desired points are determined using the reflector.

13. With the help of the device, the reflector is aimed at the reflector, and the data determination process is carried out by pressing the VSE button.

To complete the planting work and move to the next base point. By pressing the ESC key, the project is exited, and the accessory carriage is released from the tripod using the clamping screw and moves to the next observation point.

After moving to the next observation point, the tripod is fixed to the ground and the accessory is fixed to the tripod using a tripod.

14. Enter the Prog item from the main menu and select the preset station line. Press the F4 key to save. According to the method, a series of orient po coordinates (made based on the value of the coordinates determined in the existing conditional path) is selected.

15. From the next row, pressing the F2 key executes the list command, and the values of the found point are downloaded using the F4 dalee key.

16. The height of the instrument h is re-measured and entered, and once again the dalee operation is performed using the F4 key. As a result, a window will appear under the name ***Vvedite tochku orientirovani***, according to which the number and values of the point to be oriented are found using the F2 key and downloaded using the F4 dalee key.

17. The values entered are aimed at the point where the reference is being taken and the VSE button is pressed. A window of results will be created, and from it press the F4 key and execute ***vqcheslit coord. stantsii***.

18. Repeatedly pressing the F4 key, installation works are carried out. According to Ustanovka, the existing values of the reference point and the values of the re-reference point are compared. By pressing the F3 key according to the procedure, the extreme calculation of the values was downloaded.

19. As a result, the information ***Stansia I orientatsiya ustanovlenq*** appears on the display. Then, selecting the survey item from the main menu, the topographic survey work was continued by pressing the F4 key.

As a result of the above-mentioned sequences, topographic-geodetic field research in the regions was carried out, and the stage of equalization (reduction and distribution of centering errors) was carried out in special software.

After the completion of leveling works, a plan of the area based on the outline and the relief of the area will be constructed using the interpolation method. It also provides an opportunity to build a three-dimensional model based on the results of the work done in practice.

As a result of the field research carried out on the electronic tachyometer, the border areas between the Tashkent region and the city of Tashkent were topographically surveyed and the border areas were determined (Fig. 2).

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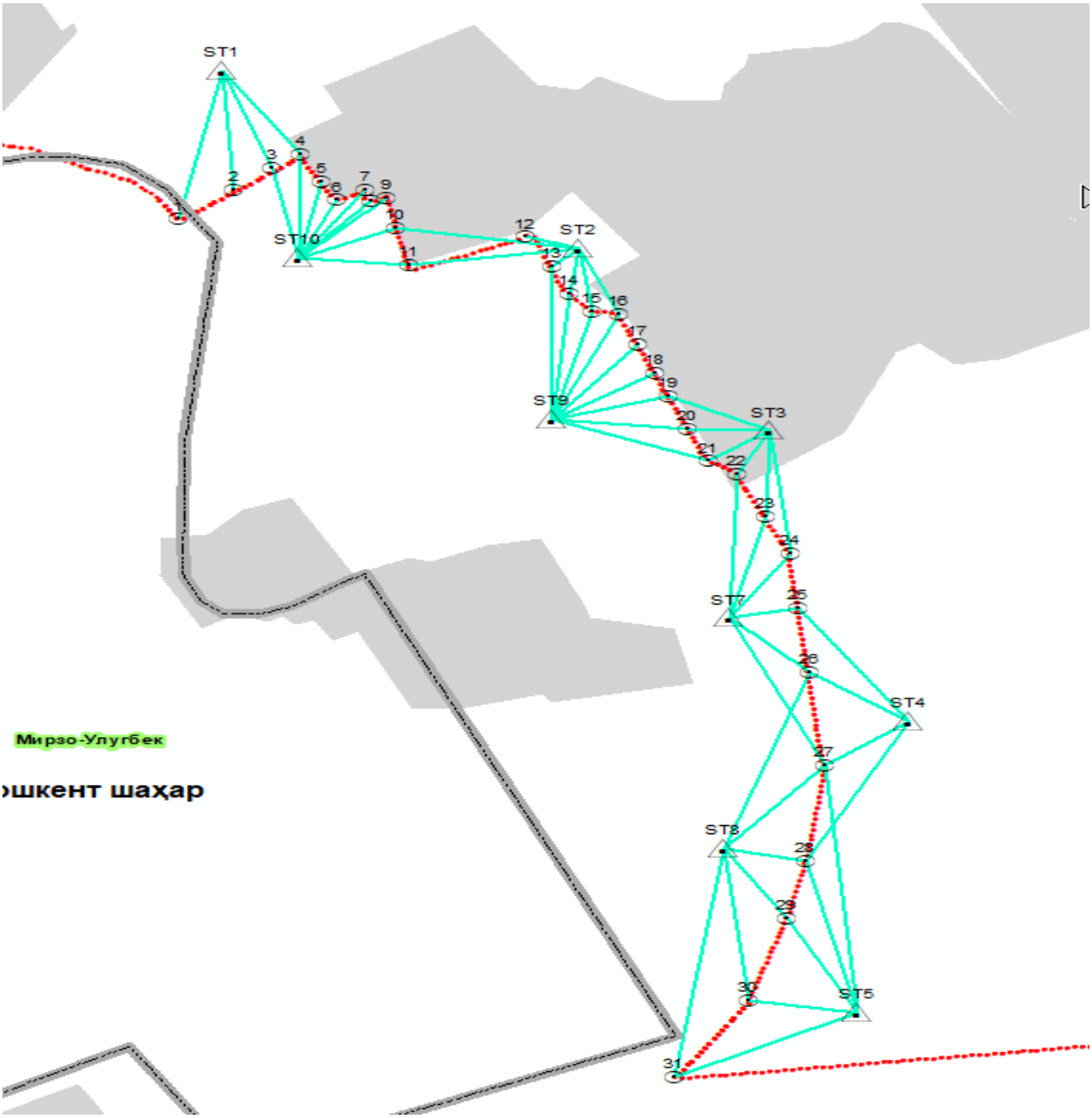

Figure 2. Field work carried out using an electronic tachyometer.

In the conducted field research, a total of 3,700 meters of distance between Qibray district of Tashkent region and M.Ulugbek district of Tashkent city was studied, and a total of 9 base stations were established (Table 1).

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Table 1
Coordinate directory of base stations

S/n	Type	Name	Geographical latitude	Geographical distance
1	Base	ST10	69,398828	41,363297
2	Base	ST9	69,404993	41,359146
3	Base	ST7	69,409325	41,354008
4	Base	ST8	69,409136	41,348082
5	Base	ST5	69,412357	41,343865
6	Base	ST4	69,413672	41,351354
7	Base	ST3	69,41032	41,358821
8	Base	ST2	69,40568	41,363541
9	Base	ST1	69,396979	41,368121

On the basis of the base stations, 31 marking points were made, and a topographic plan of the border line of the land areas planned to be transferred from Qibray district of Tashkent region to M.Ulugbek district of Tashkent region was created (Table 2)..

Table 2
Catalog of coordinates of marks

S/n	Type	Name	Geographical latitude	Geographical distance
1	Mark	1	69,395893	41,364321
2	Mark	2	69,39724	41,365078
3	Mark	3	69,398201	41,365619
4	Mark	4	69,398864	41,365992
5	Mark	5	69,399416	41,365264
6	Mark	6	69,399771	41,364796
7	Mark	7	69,400452	41,365058
8	Mark	8	69,400603	41,364764
9	Mark	9	69,400965	41,364853
10	Mark	10	69,401212	41,364078
11	Mark	11	69,401517	41,363123
12	Mark	12	69,404396	41,363833
13	Mark	13	69,405041	41,363074
14	Mark	14	69,405431	41,362356
15	Mark	15	69,405988	41,361897
16	Mark	16	69,40667	41,361845
17	Mark	17	69,40712	41,361049
18	Mark	18	69,407526	41,360325
19	Mark	19	69,407858	41,359733
20	Mark	20	69,408337	41,35888
21	Mark	21	69,408801	41,358053
22	Mark	22	69,409518	41,357726
23	Mark	23	69,410207	41,356619

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24	Mark	24	69,410801	41,355664
25	Mark	25	69,411005	41,354272
26	Mark	26	69,411246	41,352619
27	Mark	27	69,411607	41,350227
28	Mark	28	69,411151	41,347765
29	Mark	29	69,41064	41,346275
30	Mark	30	69,409708	41,344186
31	Mark	31	69,407886	41,342223

At the same time, a catalog of coordinates in the geographic coordinate system of base stations and waypoints was created (Table 1).

As a result of topographic surveying of the boundary line between Tashkent region and Tashkent city using an electronic tachyometer, vector layers were formed in the form of dotted layers. In order to geovisualize these vector layers in a field view, the researchers conducted field research using a GPS satellite wave receiver.

Field survey work was carried out using the method of field layer vectorization based on the Stonex R7 GPS satellite wave receiver. A total of 434292665.69 square meters of the territory of Tashkent city was surveyed using GPS satellite wave receiver. Including the 101006.61 meter part of Tashkent region bordering the city of Tashkent. Field research works were vectorized in a field layer consisting of a total of 784 points for the city of Tashkent. This indicator was 776 according to the existing Tashkent city border. In terms of area, it was 329531521.35 square meters. Therefore, this value shows an excess of 104761144.33 sq.m. based on the current project, in relation to the border area of the implementation (Fig. 3).

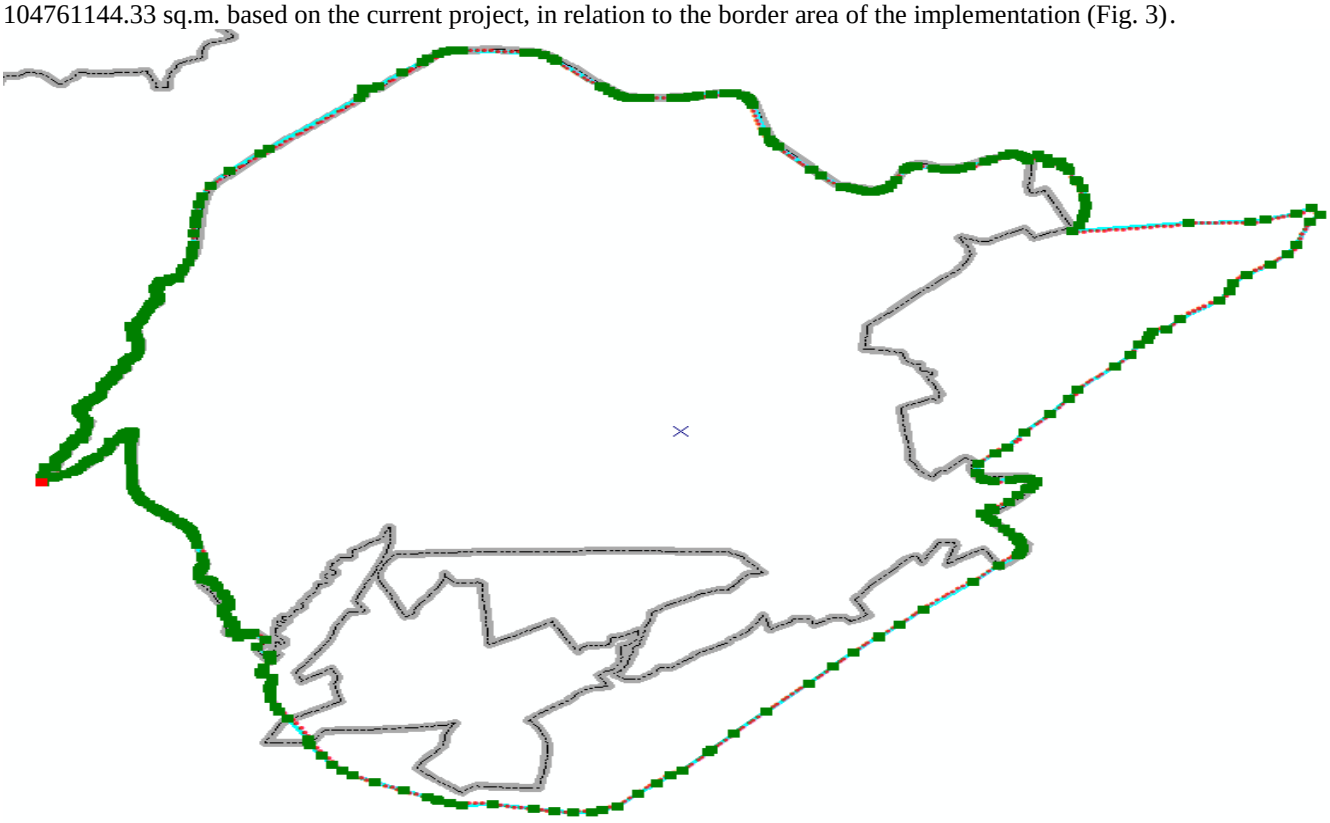

Figure 3. The results of recording the changes in the border area of Tashkent city with the Tashkent region on the GPS device.

In order to increase the accuracy of the results of the conducted field research, researchers in the GNSS satellite system used a geodetic device and carried out geodetic leveling based on the differential satellite geodetic network. The total number of differential satellite geodetic networks in our republic is 50, and there are continuously working geodetic stations.

There are a total of 4 differential satellite geodetic networks in the research area, their classification is given in Table 3.

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Table 3
Тошкент вилояти ва Тошкент шаҳридаги мавжуд дифференциал сунъий йўлдош геодезик тармоғлари таснифи

S/n	The name of the area	Location address	Abbreviated name in database
1	Tashkent region and Tashkent city	Boka district	BUKD
		Yangiyul district	YAN1
		Chirchik sh.	CHIR
		Tashkent sh.	MAGK

To use this differential satellite geodetic network, register using the web address 195.158.30.3/sbc. Renix allows you to download files with a membership fee upon registration. In the study, the authors downloaded Renix files from the database and linked them to the coordinate values obtained for field alignment, bringing all field surveys to within 2 seconds of accuracy. As a result, the boundary lines of land areas passing from the territory of Tashkent region to the territory of Tashkent city were geovisualized with high accuracy using modern geodetic methods (Fig. 4).

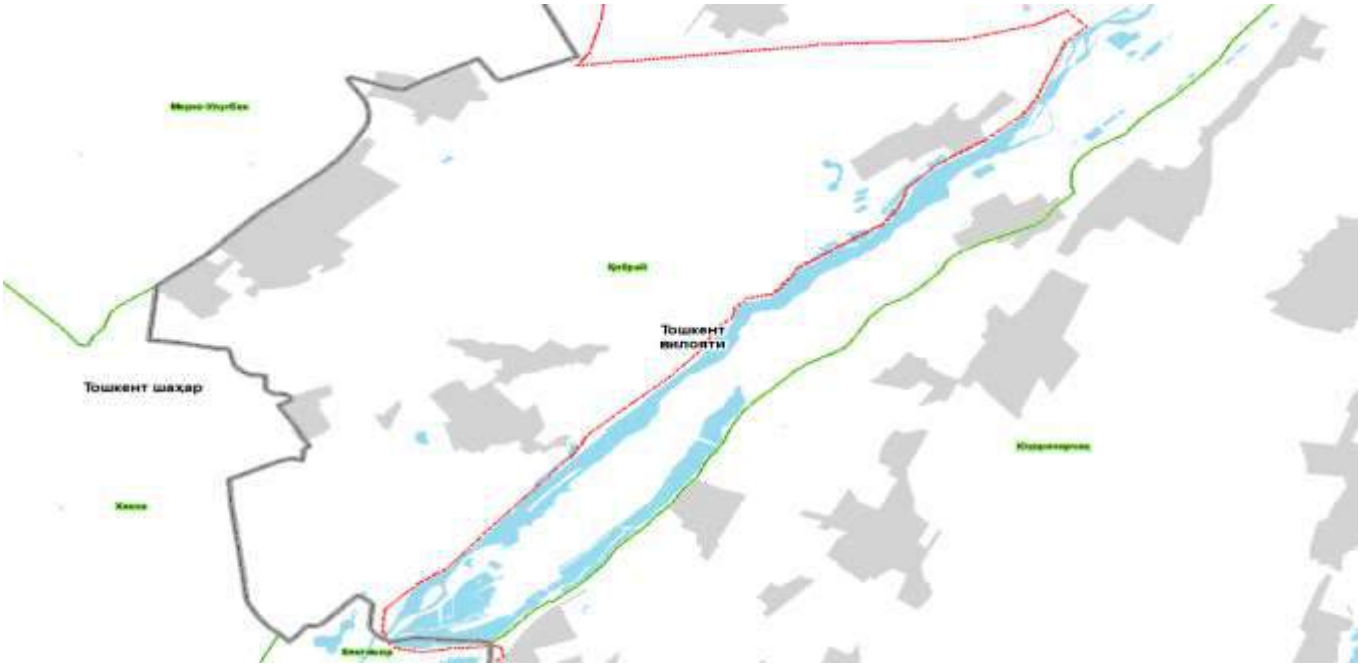

Figure 4. A high-resolution map of the land areas passing from the territory of Tashkent region to the territory of Tashkent city created in the software (in the example of Qibray district).

It is recommended by the authors to transfer agricultural land areas and residential areas in the study area from one type of land to another.

CONCLUSION

In the allocation of agricultural land to the urban area, modern techniques and technologies are a programmatic practice in the project works to achieve high-precision results. By using GPS and GNSS geodetic devices, it is possible to create a high-resolution topographic map, taking into account the infrastructure in the environment, to determine the boundary line of agricultural and residential areas in the effective conduct of field research in the separation from agricultural land to urban areas.

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THE SIGNIFICANCE OF THE REFORMS BASED ON THE NEW UZBEKISTAN DEVELOPMENT STRATEGY IN THE EDUCATION OF A STABLE GENERATION

Boltaeva Mukhayokhan Lutfullaevna
Candidate of Pedagogical Sciences, Associate Professor, Dean of the Faculty of Pedagogy and Psychology of Namangan State University

ABSTRACT
This article discusses the significance of the reforms on the basis of the new uzbekistan development strategy in the education of a complete generation. Examples of the results of reforms in real life are given.
KEY WORDS: *Development strategy, society, women's activism, development, human rights*

Today, the importance of educational processes in our lives encourages us to understand more deeply the essence of the events that are happening in society and around us. That is why the well-being of our country, national peace, and general security are directly dependent on the educational process. After all, in order to have a competent organizer and, of course, smart personnel with a new worldview and a new self-sacrifice in the spirit of patriotism, first of all, it is necessary and extremely important to fundamentally change the educational system, to raise the intellectual competence of talented young people to the level of the current demand.

Consistency of the reforms in the field of education and training in our country is aimed at expanding the coverage of young people with higher education, raising them to be knowledgeable and competent, and training experts in line with world development.

In this respect, the department of "Pedagogy and Psychology" became the faculty of "Pedagogy and Psychology". The faculty has 3 specialties: "History and Theory of Pedagogy", "Psychology" and "Educational Management" departments.

As evidence of the initial reforms in the field of education, students were focused on increasing the coverage, improving the financial status of the faculty, improving the scientific competence of professors and teachers, and providing material support. In the last 2 years alone, the number of students in our faculty has increased from 250 to 1000.

Based on the needs of the faculty, the material and technical base was improved, such as 3 innovative boards, 6 video projectors, technical tools, educational literature.

Today, it can be said with joy that the general pedagogy, teaching methodology of pedagogical psychological sciences, textbooks, training manuals correspond to 100% of students. The conditions created here, Internet connections, use of electronic libraries on computers are a great opportunity for students to study and learn.

This year, professors of the Department of Pedagogical Theory and History have published 2 teaching manuals of 4 textbooks, which is the result of the ongoing work. "Theory and History of Pedagogy" 1-2 part textbooks have been created.

These textbooks and study guides serve to help students acquire a good knowledge and become experts in their profession. This serves as the main criterion for increasing the scientific potential of the faculty and increasing its rating.

In order to develop the personal and academic achievements of students, instructions and advice have been given in the mentor-student system. In particular, mentor-apprenticeship work is being carried out in cooperation with Shukhratjonova Riksibonu, a 2nd year student of Psychology. It is no exaggeration to say that this talented student won the prestigious "Student of the Year" competition this year, which was a great achievement for the department. Riksibonu is the author of many scientific articles, media appearances, and the holder of many diplomas due to his active participation in competitions.

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In the future, it is planned to equip classrooms with online surveillance cameras. This allows parents of students to monitor and know where and what kind of education their children are getting, thereby increasing the responsibility of students to get education.

In the short period from 2020 to 2021, the number of female faculty leaders increased. Askarova O'ghiloy, the head of the "Theory and History of Pedagogy" department, is the only woman who has received the Doctor of Science and Professor degrees. Usmanova Saodat is an adviser on women's issues to the Rector of the University, the holder of the state awards of the Republic of Uzbekistan: the order "For a healthy generation" and the "Constitution of the Republic of Uzbekistan" medals, Askarova Manzura received the title of Doctor of Sciences. in pedagogic sciences (PhD) received the scientific degree of doctor of philosophy and associate professorship, currently works as the secretary of the Scientific Council of Namdu, Aziza Turgunboeva and Dilbar Boymirzaeva received the scientific degree of doctor of philosophy in psychological sciences (PhD). Doctoral students of the faculty Mirzabdullaeva Dilkhumor, Oribboeva Dilafruz, Badritdinova Madina, Abdullaeva Nilufar have successfully passed the scientific seminars to receive the doctoral degree in philosophy (PhD) in psychology. This indicates that the university has created all the opportunities and conditions for women to realize the uniqueness of their place, their identity and to realize their existing potential.

In order to reform and change the field of education, to introduce innovations, within the framework of joint educational programs with foreign countries, the University of London of Great Britain, the State University of St. Petersburg of Russia, the Aegean University of Turkey and other universities have concluded agreements on improving the qualifications of faculty professors on the basis of international grant programs. .

Effective work has also been carried out to ensure the implementation of the decisions of the President of the Republic of Uzbekistan PQ-60, PQ-61 and PQ-92. In particular, in order to organize the educational process at a high level and improve the quality of education, as well as competent organization of educational and pedagogical practices specified in the decision, in internal affairs bodies for students of the field of applied psychology, students of the field of pedagogy and psychology in general secondary schools, special pedagogy (lagopedia) training for the field contracts were concluded for internships in boarding schools and for students of social work at the "Family and neighborhood support" center.

"Marifat" radio, "Turon" student theater, "Brilliant" group of cheerful and intelligent students, "Young pedagogues", "Interesting psychology", "For speech therapists, small words" clubs are active in order to meaningfully organize free time of students. leads

Decree No. PF-6017 on radical reform of youth policy in Uzbekistan and measures to bring it to a new level and Cabinet of Ministers Decision No. 23 on approving the concept of development of youth policy in Uzbekistan until 2025, the interests of young people in the Constitution of the Republic of Uzbekistan and many other laws and rights have been reflected. The relevant Resolutions and Decrees of the President are aimed at educating the young generation in the spirit of national and universal values, to make them perfect human beings. In the current age of acceleration, the level of development of countries is determined not only by the economic and social, but also by the cultural and intellectual capabilities of young people.

In this sense, Oyjamol Mingboeva, a student of the 4th stage of the "Pedagogy and Psychology" course, won the 1st place in the university stage of the 3rd renaissance, the 1st place in the regional stage, and the honorable 2nd place in the republic stage. Nabijonova Gulmira, a student of the 2nd stage of special pedagogy (speech therapy) took the honorable 2nd place in the republican stage of the contest "Zukko kitabkhan" held among the youth of the neighborhood.

Social work (with family and children) 3rd grade student Tashmirzaev Suhrob is a talented artist, author of the poetry books "Rain of Heart", "Wrap Your Scarf", author of the lyrics of songs sung by young singers of our republic, "World Talents Association" (World Talent Association). member Suhrob Azimi (Tashmirzaev) was awarded the medal of the Republic of Kazakhstan "Uzdik Talant" (Skillful Talent), which certainly pleased us teachers.

In particular, on the initiative of the rector of our university, a total of 75 talented and enterprising students from our faculty will be given one-time scholarships of 517,000 soums for the 29th anniversary of our "Constitution". Also, our university paid contract money to 7 students in need of social protection.

The work aimed at this goal is aimed at supporting the Young Generation.

In the past academic year, our leading departments started cooperation with regional schools. Experienced professors of our faculty organized master class courses on "Pedagogical technologies" for teachers of secondary schools. Then psychological trainings were conducted for schoolchildren to guide them to choose a profession, to determine their professional

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interests. The main goal is to identify students' abilities and talents in time and to give them the right professional orientations, to help them find their way as a well-rounded person in the future.

On the basis of the "One neighborhood - one intelligentsia" program, our leading teachers have done many good things in the neighborhoods. In order to support young people with disabilities, to help them find their place in society, the team of our faculty extended a hand of material and moral support. In addition, the team of our faculty provided financial assistance of 8.5 million to low-income families in need of social assistance. In particular, psychological interviews were conducted with young people in the neighborhood, and free courses in English, Russian, biology, and computer literacy were organized for them to find their way in life. In order to meaningfully spend their free time, sports competitions and cultural events are organized.

In our faculty, the students of the "Social work (with family and children)" course together with their teachers organized a charity event under the motto "From hearts to hearts". More than 11.5 million soums collected at this event were distributed to disabled and needy families living in "Boston MFY". Of course, this charity event was covered in mass media.

The scientists of our faculty organized seminar trainings on the opportunities created for the population in our country, prevention of violence, ensuring women's employment, and in order to support the families in need of social protection in the neighborhood, the psychological environment in families, early marriage and its consequences, all the good works that are being carried out in the way of the country's development. opinions on improving living conditions and serving their interests were expressed.

In order to ensure the implementation of the letter No. 87-03-1265 dated March 4, 2021 of the Ministry of Higher and Secondary Special Education of the Republic of Uzbekistan, the orphanage was visited under the leadership of Namangan State University Rector S. Turgunov. Today, Namangan State University has 6 students from the House of Mercy in Namangan, 2 of them are students of the Faculty of Pedagogy and Psychology. All conditions are created for these students to receive quality education, and they are regularly encouraged materially and morally. The rector of the university, while getting acquainted with the conditions created for the students,

They noted that the visit of the Honorable President Sh.Mirziyoev to this institution during his visit to Namangan region and the opinions expressed by him are an example for all of us, and at the same time, they set high tasks for us. During the meeting, a friendly conversation was organized with the foster children, and the university team presented a modern video projector and a marker board for the House of Mercy.

In addition, it was agreed that 10 students studying in the 3rd year of Pedagogy-Psychology of the University will conduct qualification practice in order to conduct professional practice in orphanages and carry out diagnostic, psychological-prophylactic, correctional and rehabilitation work with children. Another important aspect is the organization of preparatory courses for the graduating students of the House of Mercy with the participation of potential and experienced professors and teachers of the faculty. Rector of Namangan State University, it was agreed for 10 students studying in the 3rd year of Pedagogy-Psychology to undergo qualification practice in the orphanages and to carry out diagnostic, psychological-prophylactic, correctional and rehabilitation work with children.

As the head of the faculty and a scientist, I try to carry out systematic work every day to plan and implement activities, increase the professional and innovative activity of professors, and increase the efficiency and productivity of the educational process. the educational process conducted with students is reflected in the level of ratings of higher educational institutions both nationally and globally.

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EPRA International Journal of Research and Development (IJRD)
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UDC 633.88

LABORATORY STUDIES OF THE GENERABILITY OF MALVA SEEDS *(MALVA L.)*

Saitova Azima Kalzhanovna
Candidate of Biological Sciences, Associate Professor, Department of Agroecology and introduction of medicinal plants, Karakalpak State University named after Berdakh, Republic of Karakalpakstan

АННОТАЦИЯ
The article discusses the results of laboratory studies of the germination of seeds of mallow (Malva l.). The medicinal plant mallow has been used in medicine since ancient times. Mallow (Malva L.), is a genus of herbaceous plants of the Malvaceae family, the type genus of this family.
KEYWORDS: *balance, germination, laboratory, seeds, Petri dish, level.*

INTRODUCTION

By the 21st century, humanity has reached the level of using nature for its own needs, which has led to a violation of the ecological balance. The plant world, considered an important component of nature, has undergone major changes today. In particular, the floristic and systematic composition of individual regions, districts and the state of plant resources change from day to day due to changes in environmental conditions.

Medicinal herbs are widely used in the treatment of various human diseases, both in scientific medicine and in traditional medicine. With the development of natural science, botany, biologists, doctors, and chemists scientifically substantiated the practical use of many medicinal plants and enriched traditional medicine in this regard.

Today, one of the important tasks facing botanists in Uzbekistan is the conservation of plant diversity, as well as the protection of rare and endangered species and the study of the gene pool of existing plants and their resources on a scientific basis.

The wealth of inexhaustible and diverse plants of our country is a great resource for obtaining medicines. Despite the rapid development of synthetic chemistry and the fact that many drugs are obtained chemically, currently up to 40% of medicinal preparations are obtained from herbs.

In this regard, in order to organize the cultural cultivation and processing of medicinal plants, support the construction of cultural plantations of medicinal plants, as well as the widespread use of medicinal plants in the prevention and treatment of diseases was accepted, Decree of the President of the Republic of Uzbekistan, of 20.05.2022 No. PP-251 "On measures to organize cultural cultivation, processing and widespread use of medicinal plants in treatment."

METHODS AND MATERIALS

Studies on the germination of mallow seeds were carried out in laboratory conditions at the Faculty of Biology of Karakalpak State University. General botanical methods are used. The purpose of the study was to study the germination of mallow seeds in laboratory conditions. Plant seeds were planted in Petri dishes with distilled and ordinary water, humus, and 25 seeds were planted in 4 Petri dishes.

RESEARCH RESULTS

The medicinal plant Mallow (Malva L.) has been used in medicine since ancient times. Malva (Malva L.), is a genus of herbaceous plants of the Malvaceae family, the type genus of this family. Mallow is an annual, rarely bi- and perennial herbaceous plants, with a lying, ascending or straight stem, at first fluffy hairy, and later naked, 30-120 cm high.

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The leaves are petiolate, rounded heart-shaped, with five to seven lobes, or incised, pubescent.

Flowers one to five in leaf axils; very few species have inflorescences - brushes. Petals deeply notched, oblong-obovate, pink, with three dark longitudinal stripes. Blooms from June to August. Mallow seed pods are small, rounded in shape.

The scientific study of mallow was carried out in laboratory conditions. Plant seeds were planted in Petri dishes with distilled and ordinary water, humus, and 25 seeds were planted in 4 Petri dishes. After that, the seeds were planted on a paper napkin in plain water. These waters were at room temperature and kept at the same temperature in Petri dishes. Seeds planted on a napkin in ordinary water began to take root within 4 days. The seeds planted on this napkin were given an average of 5-10 ml of water per day.

Observations were made twice a day, in the morning and in the evening. When checking the germination of seeds of a medicinal button in laboratory conditions, the average germination was 45 seeds out of 100 seeds, and the average germination was 45%.

Fig.1 Germination of seeds in a Petri dish

Under greenhouse conditions, the seeds were sown by placing 10 seeds in 4 cups of 300 ml. Seeds in humus 6 cm thick and cups 1 cm thick were planted to a depth of 1.5 cm.

Within 7 days after sowing, the plants began to slowly germinate. Before germination, the plants were moistened 2 times during 7 days, in the morning and in the evening.

When measuring in a greenhouse 9-day-old young shoots of a plant planted in humus and sand, it turned out that their height is 2 cm. You can observe how young seedlings of a 10-day-old plant planted in humus and sand in greenhouse conditions, gradually turn green and chloroplast pigments appear in them.

Seeds sown in humus and sand under greenhouse conditions were carefully studied, for example: the growth of young seedlings, their desire for light, the appearance of the first lawns of plants, the appearance of the first leaves.

For 15 days, young seedlings planted in humus and sand and germinated in greenhouse conditions grew tall.

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Fig 2. Germination of mallow seeds

Under greenhouse conditions, young seedlings of plants planted in humus and sand were observed for a total of 22 days from the date of planting, after which the germination of plant seeds was determined.

Taking into account the fact that the experiment was carried out with 10 seeds in each of 4 glasses, 14 seedlings emerged from 40 seeds, and the seed germination was 35% (table).

Table

Permeability values in clay and sand mallow seeds

№	Boarding time 10.05.	17.05.	19.05.	20.05.	24.05.	Germination (%)
1	0	0	1	1	3	30%
2	0	2	4	4	4	40%
3	0	4	4	4	4	40%
4	0	1	2	3	3	30%
Average germination (%)						35%

CONCLUSION

The results thus obtained show that the germination of mallow seeds planted under laboratory conditions in Petri dishes was 45 seeds out of 100 seeds and the average germination was 45%. Planted mallow seeds in greenhouse conditions in humus and sand, out of 40 seeds, 14 seedlings sprouted and seed germination was 35%.

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ECONOMIC VALUABLE TRAITS OF INTRASPECIFIC DIVERSITY OF OLD-WORLD SPECIES OF COTTON

Kh.A.Muminov, R.J.Khamroyev

Department of Biology, Chirchik State Pedagogical University, Tashkent, Uzbekistan

ABSTRACT

Use of the valuable cotton germplasm of wild relatives in works of improvement of cultivars and develops of new ones, meeting modern requirements, is for the present limited by a blank in our knowledge of all biological and morphological diversity. On the basis of studying and an estimation to morphological and biological and economic-valuable traits of representatives of an intraspecific diversity of species G.herbaceum L. and G.arboreum L. It is determined that as a whole, are characterized by photoperiodicity, low indicators of cotton raw weight per boll, length and a fiber output. Low indicators of components of productivity, photoperiodicity and late maturity indicate in their wild nature. Attraction of wild forms as an initial material in genetic and breeding research gives the chance for enrichment of genotypes in development of new high-quality and highly productive cultivars.

KEY WORDS: *evolution, cotton, subspecies, varieties, 50% germination - maturation, fiber length, fiber output, raw cotton weight per one boll.*

INTRODUCTION

Cotton has a huge diversity of genetic resources of the world cotton. However, these features are not used to completely. Wild and semi-wild perennial forms cotton- single gene is-important source of such features as resistance to *Verticillium* wilt and gummosis, piercing-sucking insect pests, frost, have very steady and fine fiber. However, success can be achieved only by using a selection methods and laws of modern genetics [1-5].

Decisive in the phenotypic expression of genetic traits of an organism in ontogeny was determined the environmental factor: temperature, light, humidity, power, geographical location of the area, as well as other physical conditions of upholstered [7]. In the course of a long evolution that took place in connection with the promotion of cotton to the north, east and south of the equator, formed "one-year" early ripe form. However, these varieties of cotton are closer to the neutral category because of their ability to reproduce in a very wide amplitude of day- length, while for the vast majority of initial tropical species are characterized by their pronounced adaptability to reduction day [7-8].

It is important to say that wild species occupy narrow ranges, and some endemic species are very rare and are gradually disappearing. Their habitats are steppe, desert, dry savanna. They grow on the beams, at the foot of the hills, stone- places, coasts of oceans, preserved only in places inaccessible to livestock. A large number of wild, semi-wild and cultural and tropical species is localized in the New World, Africa and Australia.

Noting the role of the social environment in the formative process, gradually, but for thousands of years, due to natural and artificial selection was created ruderal cotton- anthropo chore and its more absolute cultural forms [8, 9, 10, 11, 12, 13].

However, these diversity forms and species are not exhausted in the selection. In that way, the use of valuable germplasm of wild relatives of cotton for improving cultivars and new meeting modern requirements, while still limited gaps in our knowledge of all biological and morphological diversity. Unexplored link, there are still intra-species polymorphic, diploid species of *G.herbaceum* L. and *G.arboreum* L., and were not studied the characteristics of their biological inheritance and domestic valuable features.

Long-term observations and morphological descriptions were revealed features of reproductive period of plants grown under the natural photoperiod and photoperiod (*10 h light per day*) in the greenhouse and vegetative field.

In this article, the aim of our research was to assess morph-biological valuation of the representatives of intraspecific diversity Indochinese cotton on the basis of which will be allocated to the most valuable forms for their involvement in the honors

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of initial material in selection and genetic research to enrichment of genotypes in the creation of new high-quality and high-yielding varieties.

SOURCES AND METHODS OF EXPERIENCE

The object of the research were intraspecific diversity Indochina cotton stored in the gene pool IGEBP AS RUz, members of the species *G.herbaceum* L. wild form subsp. *africanum* (Watt) Mauer, perennial ruderal form- subsp. *pseudoarboreum* Mauer and subsp. *pseudoarboreum* f. *harga*, cultivate form subsp. *euherbaceum* (cultivar «377»); as well as members of the species *G.arboreum* L.: wild form- subsp. *obtusifolium* (Roxb.) Mauer and subsp. *obtusifolium* var. *indicum*, the perennial ruderal form subsp. *perenne* (Blanco) Mauer, polysympodial and sympodial tropical form- subsp. *neglectum* (Tod.) Mauer and subsp. *neglectum* f. *sanguineum*, sympodial subtropical form subsp. *nanking* (with brown fiber) and a variety of cultural form- cultivar «VIR 1372».

During the research carried out phenological observations, analyzes of the field and laboratory and were assessed the main morph biological and valuable economical attributes of cotton. Evidence generated data were statistically processed by the standard methods [6].

RESULTS OF THE EXPERIMENTS

The assessment studied representatives of the Indochinese cotton was revealed the difference and the wide variation in morphological and economically valuable traits such as: length of the vegetation period, the length of the fiber, a lint output and weight of raw cotton per one boll. The lower results of these morphological features were led.

The duration of the vegetation period. It is structurally complex trait and was determined by the following elements: the duration of period, the necessary of conversion of the bud into a flower and a day ovary in the disclosed boll. Traits vary greatly depending on soil and climatic conditions and farming. We have studied the results- length of the vegetation period of intraspecific varieties and species *G.herbaceum* L. *G.arboreum* L, where has been defined the wide variation from 117.0 to 146.0 days. Initial wild forms and their subspecies variations subsp. *africanum.* was characterized by weak-photoperiod and the current trait showed the variability from 134.0 to 138.0 days. But among the cultural forms of tropical species of *G.herbaceum* L. was educed the early maturity form- subsp. *euherbaceum* (cultivar of «377») and subsp. *pseudoarboreum* with vegetation period 117.0 and 119.0 days respectively (Table 1., Fig 1.).

Table 1.

The duration of the vegetation period and fiber length of the intraspecific representatives of the species *G.herbaceum* L. and *G.arboreum* L.

Subspecies and forms	50% germination - maturation, days		Fiber length, mm	
	$\bar{x} \pm S\bar{x}$	*V*%	$\bar{x} \pm S\bar{x}$	*V*%
subsp. *africanum*	136.0 ± 0.49	1.1	25.0 ± 0.26	3.2
subsp. *pseudoarboreum*	119.0 ± 0.60	1.5	24.1 ± 0.24	3.1
subsp. *pseudoarboreum* f. *harga*	122.0 ± 0.67	1.7	19.6 ± 0.25	4.0
subsp. *euherbaceum* (cultivar «377»)	117.0 ± 0.58	1.5	21.6 ± 0.25	3.6
subsp. *obtusifolium*	130.0 ± 0.56	1.3	25.0 ± 0.36	4.5
subsp. *obtusifolium* var. *indicum*	138.0 ± 0.47	1.0	24.0 ± 0.34	4.4
subsp. *perenne*	130.0 ± 0.70	1.7	24.8 ± 0.34	4.3
subsp. *neglectum*	146.0 ± 0.52	1.1	22.0 ± 0.36	5.1
subsp. *neglectum* f. *sanguineum*	119.0 ± 0.56	1.4	23.8 ± 0.31	4.0
subsp. *nanking* (with brown fiber)	119.0 ± 0.30	0.8	21.3 ± 0.45	6.6
Cultivar «ВИР 1372»	117.0 ± 0.47	1.2	22.5 ± 0.18	2.5

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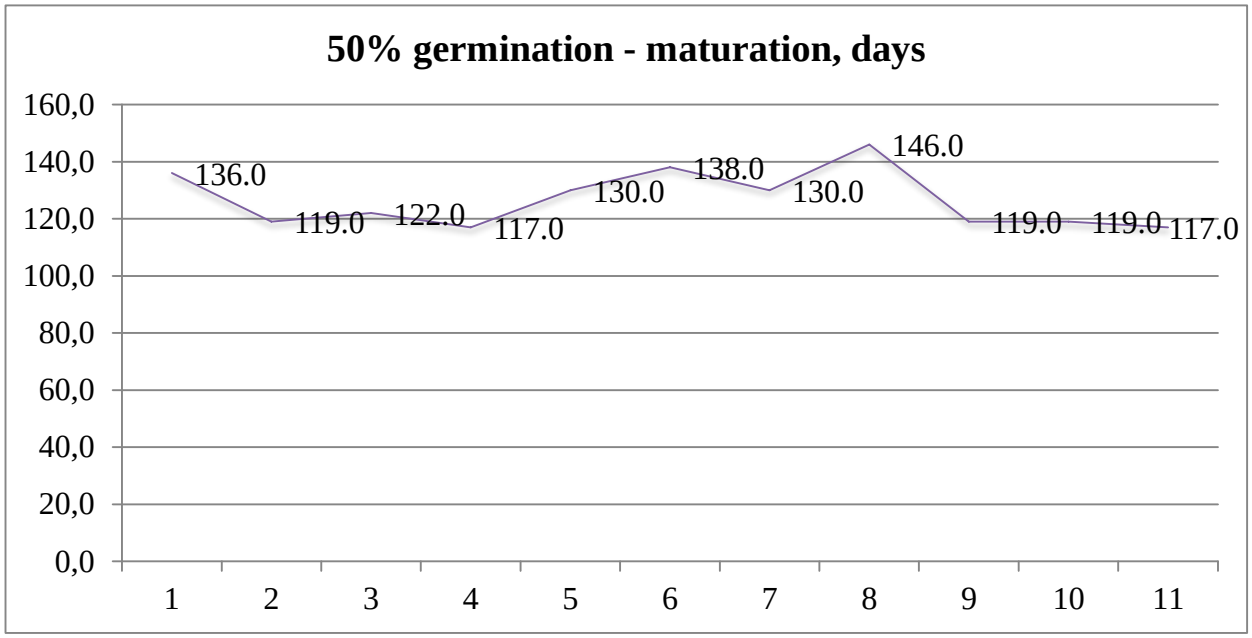

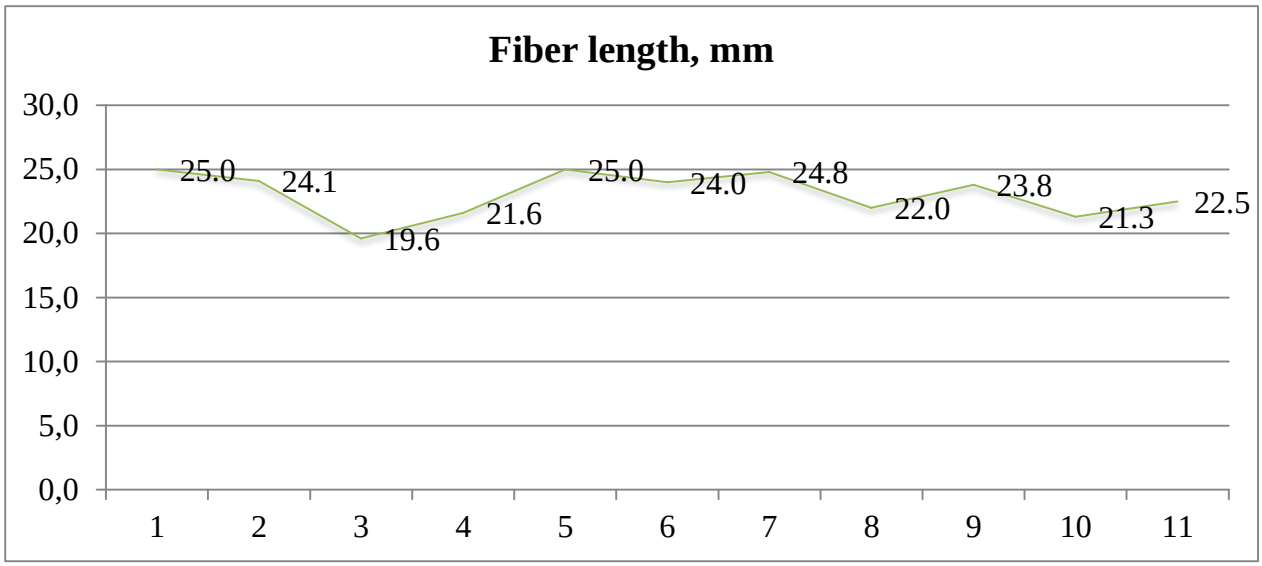

Figure 1. 1. subsp. *africanum*, **2.** subsp. *pseudoarboreum*, **3.** subsp. *pseudoarboreum* f. *harga*, **4.** subsp. *euherbaceum* (cultivar «377»), **5.** subsp. *obtusifolium*, **6.** subsp. *obtusifolium* var. *indicum*, **7.** subsp. *perenne*, **8.** subsp. *neglectum*, **9.** subsp. *neglectum* f. *sanguineum*, **10.** subsp. *nanking* (with brown fiber), **11.** Cultivar «ВИР 1372»

Medial-maturity was signed in the form subsp. *pseudoarboreum* f. *harga* (122.0 days). Showing trait of «the duration of the vegetation period» in the form of intraspecific varieties *G.arboreum* L. was different. High exactingness on photoperiod was showed in the subspecies subsp. *neglectum*, which was with late-maturity of the vegetation period from 138.0 to 146.0 days. Short vegetation period was observed in subspecies subsp. *neglectum* f. *sanguineum* and subsp. *nanking* (with a brown fiber), as well as in the variety «VIR 1372», which was shown the present trait was at the level of 117.0-119.0 days. It was found that the wild, ruderal and cultural-tropical intraspecific varieties and forms of *G.herbaceum* L.

G.arboreum L. characterized by photoperiod and middle-maturity while cultivated varieties of the earliest maturity and have a neutral reaction to the length of daylight.

Fiber length. This trait is changed by growth conditions and within the plants depending on the location of the plant boll, within the lacinula limits and within the even seeds. In our research, a trait of «fiber length» at the intraspecific varieties of the researched species was showed a wide variability in the range of 19.6 to 25.0 mm. Subspecies and species form of *G.herbaceum* L

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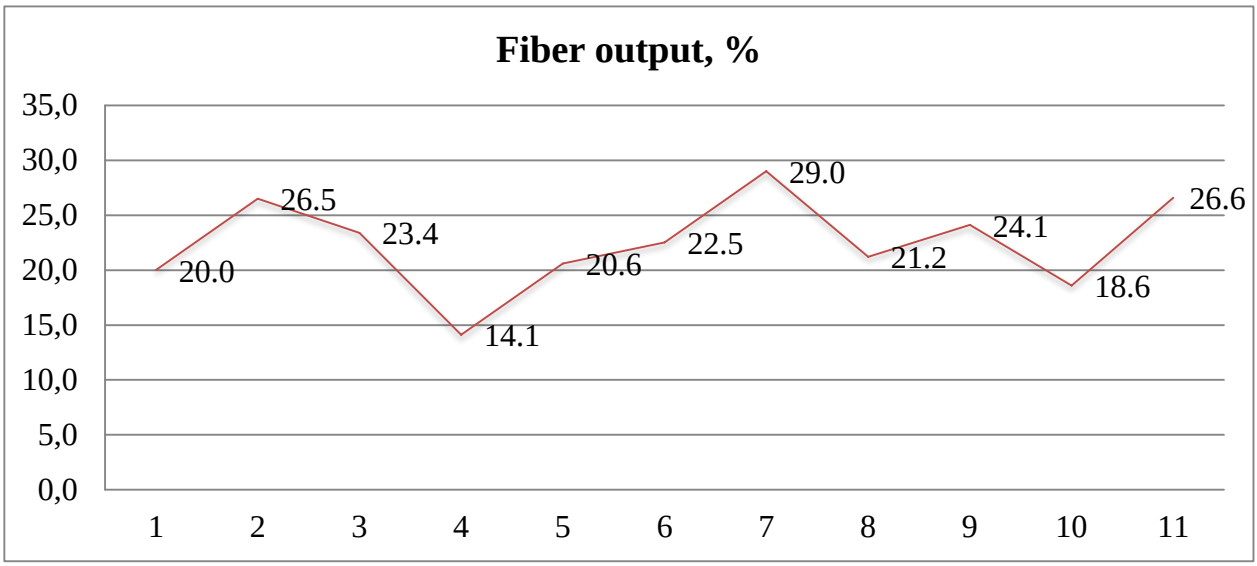
was not different with the current trait: from the wild form it was 25.0 mm, from the ruderal form- within from 19.6 to 24.1 mm, and cultural-tropical forms (subsp. *euherbaceum* (cultivar «377»))- 21.6 mm. Representatives of the intra-species varieties of *G.arboreum* L., is also characterized high fiber length by relatively (21.3-25.0 mm). Relatively high fiber length formed in wild and ruderal forms (subsp. *obtusifolium*- 25.0 mm, subsp. *obtusifolium* var. *indicum*- 24.0 mm, subsp. *perenne*- 24.8 mm) and relatively short-cultural subtropical forms (subsp. *nanking* (with brown fiber)- 21.3 mm) (Table 1.).

Fiber output. This trait is one of the main economical valuable of fiber cotton, defining harvest from per unit area. Fiber output is complex trait, determined by the mass of seeds and fiber index. Study of this trait was carried out in wild, ruderal and cultural-tropical species *G.herbaceum* L. and *G.arboreum* L., where there is a wide variability in the output fibers from 14.1 to 29.0%. Parameters of fiber output of the representatives of species *G.herbaceum* L. were different (14.1-26.5%). Variability of the researched-trait in the intraspecific species *G.arboreum* L. was signed within the range from 18.6 to 29.0%. The highest output fiber among the given set of samples was watched in subsp. *perenne*- 29.0%, and at the least- subsp. *euherbaceum* (cultivar «377»)- 14.1%. The other representatives of this species fiber output was ranged from 20.6 to 26.6% (Table 2., Fig 2.).

Table 2.
Fiber output and raw cotton weight per one boll of the intraspecific representatives of the species *G.herbaceum* L. and *G.arboreum* L.

Subspecies and forms	Fiber output,%		Raw cotton weight per one boll, g.	
	$\bar{x} \pm S\bar{x}$	*V*, %	$\bar{x} \pm S\bar{x}$	*V*, %
subsp. africanum	20.0 ± 0.22	3.5	0.9 ± 0.03	8.8
subsp. pseudoarboreum	26.5 ± 0.11	1.3	1.7 ± 0.04	8.0
subsp. pseudoarboreum f. harga	23.4 ± 0.03	0.4	1.2 ± 0.02	6.4
subsp. euherbaceum (cultivar «377»)	14.1 ± 0.05	1.1	1.1 ± 0.02	6.3
subsp. obtusifolium	20.6 ± 0.12	1.9	1.1 ± 0.04	10.2
subsp. obtusifolium var. indicum	22.5 ± 0.03	0.5	1.0 ± 0.04	14.1
subsp. perenne	29.0 ± 0.07	0.8	2.1 ± 0.09	13.6
subsp. neglectum	21.2 ± 0.04	0.6	1.9 ± 0.07	10.9
subsp. neglectum f. sanguineum	24.1 ± 0.04	0.6	1.5 ± 0.06	11.8
subsp. nanking (with brown fiber)	18.6 ± 0.09	1.4	1.4 ± 0,08	17.3
Cultivar «ВИР 1372»	26.6 ± 0.22	2.6	1.7 ± 0.08	14.0



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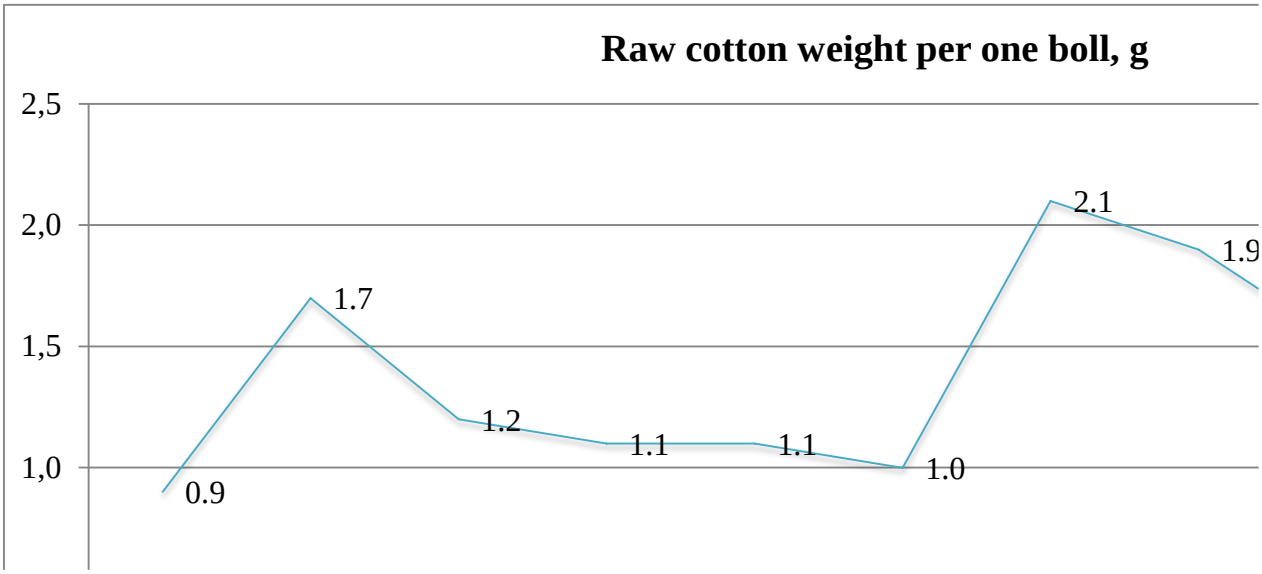

Figure 2. 1. subsp. *africanum*, **2.** subsp. *pseudoarboreum*, **3.** subsp. *pseudoarboreum* f. *harga*, **4.** subsp. *euherbaceum* (cultivar «377»), **5.** subsp. *obtusifolium*, **6.** subsp. *obtusifolium* var. *indicum*, **7.** subsp. *perenne*, **8.** subsp. *neglectum*, **9.** subsp. *neglectum* f. *sanguineum*, **10.** subsp. *nanking* (with brown fiber), **11.** Cultivar «ВИР 1372»

Raw cotton weight per one boll. The productivity of raw cotton is the most difficult trait, and it is determined by the number of bolls per plant and the raw cotton weight per one boll. However, productivity also depends on many other traits- early maturity, resistance to diseases and pests, the plant's ability adapts to varying environmental conditions. In our research, the parameter among the representatives of the intraspecific varieties of the species *G.herbaceum* L. and *G.arboreum* L. showed the variability in the range of 0.9 to 2.1 g. The raw cotton weight per one boll of the intraspecific representatives of the species *G.herbaceum* L. was noted in the range of 0.9 to 1.7 g. The large bolls was formed by ruderal form (1.7 g), medium- in cultural forms (1,1 g) and small- the wild forms (0.9 g). The variability of the studied trait in the intraspecific variety of *G.arboreum* L.was characterized by a range of 1.0 to 2.1 g. It was noted that the large bolls in ruderal form (subsp. *perenne*- 2.1 g) and cultural - tropical forms subsp. *neglectum*- 1.9 g) and small in the native wild form- subsp. *obtusifolium* and subsp. *obtusifolium* var. *indicum*- 1.0-1.1 g.

CONCLUSIONS

Based on the research and the evaluation of the morpho-biological and economically valuable feature of the representatives of intraspecific variety of species *G.herbaceum* L. and *G.arboreum* L. was found that, in generally, was characterized by photoperiod, lower- raw cotton weight per one boll, length and output of fiber. Low parameters of fertility components, photoperiod and lateness was showed on their wildlife.

It should be noted that many wild cotton species, including the species of *G.herbaceum* L. and *G.arboreum* L. have an interest for genetic and breeding research, as they have genes carrying an extremely valuable traits, absence in cultural forms: high quality fiber, adaptation potential to abiotic and biotic factors outer environmental. Attraction of these forms in hybridization in the future will allow to combine the most valuable features and traits, far fragmented in the course of evolution, and develop a wide variety of valuable hybrid generation.

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SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 7 | Issue: 12 | December 2022 - Peer Reviewed Journal

EXPERIMENTAL APPLICATION OF IMAGE TRANSFORMATION TECHNIQUE USING MATLAB

Aashi Shrivastava[1, a*], M.P. Parsai[2, b]
[1]*Jabalpur Engineering College, Jabalpur, M.P., India*
[2] *Jabalpur Engineering College, Jabalpur, M.P., India*

ABSTRACT
The paper elobrates the practical need todeal with image transformation, though there are multiple techniques of image transformation our work is focussed on addition of two images. The images taken in this works is of same dimensions, whereas the programming expressed in the paper will also work for images of different sizes. The work also discusses that how the effect of one image intensity can be reduced or increased so as to see the higher or lower effect on two merged images. The transformations are performed using programming code written in MATLAB.
KEYWORDS: Image, transformation, operation

INTRODUCTION

Image is a visual representation of the surrounding around us, this 3D world is expressed in a 2D plane format. Image stores a large amount of information in form of pixels, these pixels are expressed in for of matrix and the complete matrix put together makes a complete image. in case when a single image is not sufficient to provide all the necessary information needed, we require to merge the important details of multiple images into a single image. For example, consider mapping an infrastructure project to be set up. Her to provide the exact location of roads, rivers, and other surrounding details these image topological images can be overlapped to define the location of all regions of interest. This might seem difficult to image, let us try to understand it with a day-to-day application. Today many of the people travel to new markets and work spaces and today they use a very efficient technology called Google Maps. These maps are nothing but layered images all merged to form a single image which caters its users to locate all necessary details on a single image such as roads, office buildings, drainage, parks and other vegetation. Its practical application calls of research in the are of image processing with major focus of edge detection, image segmentation, image refinement and all merged together to form a single image by image addition.

RELATED WORK

Image processing is field of continuous growth thus many researchers have continued to work in this filed. Work of Congbo Luo et al. [1] has been focused on the transformation of digitals images and its current scope in digital image processing technology. Gonzalez et al. [2] have worked on various types of image processing operations and expressed on various types of mathematical transformation that are performed in digital image processing, from this matrix addition operation performed on digital images falls within the preview of our work. Diksha et al. [3] have discussed multiple ways about the image segmentation techniques, these techniques have been found very useful in the process of addition of image, because if the images remain segmented in form of multiple edges in the final image, then the final added image will lose its purpose to supply all the necessary information.

Athematic Operation on Image

Image being a 2D represented of an object, it made by combining pixels in an orderly manner to form a complete image and these pixels are represented by intensity levels. The athematic operation are performed on the image pixel by pixel. These are fairly simple operations of image processing but are found to be used in large number of applications. Since the operation is performed on pixels it becomes important the images should be of same dimensions. In contrast if it is not so, the merged images will provide information common only in the dimensional range of the two images and some information can be lost.

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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The types of Arithmetic operations are

1. Addition: when two images say P and Q of same dimension are supplied with addition operation, it results to a new images R, the dimensions of whose are same and the resultant pixel intensity is the sum of value of pixel intensity of the original images.

$$R(m,n) = P(m,n) + Q(m,n)$$

Where m, n is number of pixels in horizontal and vertical dimension of an image.

2. Subtraction: when two images say P and Q of same dimension are supplied with subtraction operation, it results to a new images R, the dimensions of whose are same and the resultant pixel intensity is the difference of value of pixel intensity of the original images.

$$R(m,n) = P(m,n) - Q(m,n)$$

3. Multiplication: when two images of say P and Q of same dimension are supplied with multiplication operation, it results to a new images R, the dimensions of whose are same and the resultant pixel intensity is the multiplication of value of pixel intensity of the original images.

$$R(m,n) = P(m,n) * Q(m,n)$$

4. Division: when two images of say P and Q of same dimension are supplied with division operation, it results to a new images R, the dimensions of whose are same and the resultant pixel intensity is the division of value of pixel intensity of the original images.

$$R(m,n) = P(m,n) \div Q(m,n)$$

Mathematical Computation Applied to Image

The discussed mathematical operation, that is the addition operation is performed on two image and the final image is the resultant image of the mathematical operation as shown in Fig 1 and Fig 2. The following addition operation is performed using MATLAB.

MATLAB Program

```
Clc
clear all
close all
I = imread('1.jpg');
        figure;
imshow(I);
        title ('First Image');
g=size(I);

J = imread ('Capture.JPG');
J =imresize (J, [g (1), g (2)]);
        figure; imshow (J);
title ('Second Image');
        for i = 1: g (1)
        for j = 1: g (2)
        for k=1:3
output (i, j, k) = (I (i, j, k) +J (i, j, k));
```

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```
        end
                end
        end
figure;
imshow(output);
 title ('Added Image');
```

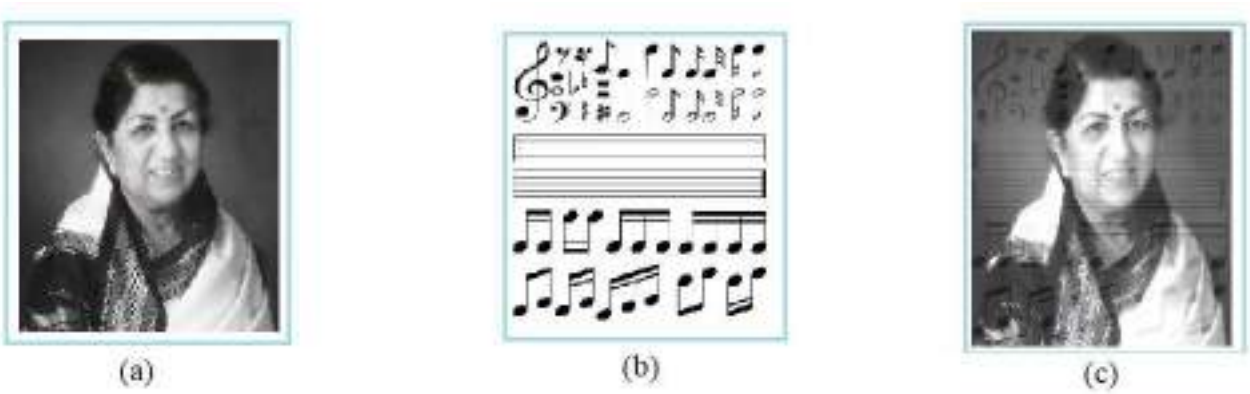

Fig 1. (a) First input image [4]. (b) Second input image [5]. (c) Resultant addition image.

Fig 2. (a) First input image [6]. (b) Second input image [7]. (c) Resultant addition image.

CONCLUSION

The resultant image as shown in Fig 1(c) and Fig 2 (c) are the results of addition of pixel of two input images to get this final image.This application of image processing can also be used to add more than two images as required for the purpose. The MATLAB program is written with an image resize option, so even if the dimensions of two input images are not same, the computation will be performed. This brings us with the future scope of research that when the image of different dimensions is resized to merge to a final image, the resized image loses its resolution hence producing blurry effect as shown in Fig 2(c).

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SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 7 | Issue: 12 | December 2022 - Peer Reviewed Journal

BIOTECHNOLOGICAL PROCESSING OF ORGANIC POULTRY WASTE AND ITS USE IN AGRICULTURE

Saimnazarov Yuldash Bekmirzaevich
Doctor of Biological Sciences, Professor, Institute of Rice Researches, Tashkent, Uzbekistan

Article DOI: https://doi.org/10.36713/epra12036
DOI No: 10.36713/epra12036

ABSTRACT

Up-to-date biotechnologies are involved in the biological transformation of organic poultry waste into an environmentally friendly fertilizer that can preserve soil fertility and significantly improve yields. Currently, no more than 35% of livestock manure is used as a fertilizer in Uzbekistan.

The use of poultry manure at poultry farms in Uzbekistan has been poorly addressed today. Poultry manure is discarded outside the poultry farms, where it is either filled with pits not suitable for storage or unloaded in a specially designated area. Afterwards, it is not used and causes tremendous damage to the environment. At the same time, bird droppings contain high macro and microelements, which form the basis for their value as organic fertilizers.

***The article analyzes** and summarizes the practical use of biotechnological processing of bird droppings into a fertilizer and its further application on strawberry seeds as one of the reasonable solutions to the economic and environmental safety of poultry production under industrial conditions.*

***The relevance of the topic.** The solution to the problem of manure recycling is to improve the environmental situation, soil fertility and crop yields.*

***The research is aimed at** processing organic poultry waste and the impact of organic fertilizer, which is based on chicken manure, on soil fertility and crop yields.*

***The laboratory and field studies** on poultry waste management have been carried out on the territory of OOO Silver Eagle Plus (LLC) poultry farm in Tashkent region using the method of anaerobic fermentation and assessment of organic fertilizer quality as the most rational one for agriculture.*

***The studied objects** have been organic waste from OOO Silver Eagle Plus (LLC) poultry farm in Tashkent region, meadow soil and Joydori strawberry seeds.*

***The research results** have shown that the method of methane digestion is effective against pathogens in organic poultry waste; the process increases the number of useful bacteria and the generation of metabolites such as organic acid. Biotechnological poultry waste disposal reduces the processing time of the source material by 1.5 times.*

***The study has revealed** that the application of organic fertilizer based on chicken droppings has had a positive impact on soil structure, which has enhanced its aeration and ensured proper vegetative root system development.*

KEYWORDS: *biotechnological processing, poultry farming, organic waste, anaerobic digestion, biofertilizer, soil fertility, ecology.*

INTRODUCTION

For combating the environmental issues in Uzbekistan, it is worth paying attention to the operations of poultry farms, organic waste of which should be promptly processed by biotechnological methods. Organic poultry waste includes bird droppings, low-value feathers, blood and organs, which represent an aggressive substance that contains a vast number of harmful microorganisms such as disease-causing bacteria, helminth eggs, larvae, and weed seeds; besides, it has an unpleasant odour.

In the past, under intensive farm management cows with small dairy production and chickens were kept primarily for manure. The concentration of cattle or bird per unit of land was minimal. Manure was accumulated near the farms or taken to fields, where it gradually turned into humus.

Today, this method of application raises several problems. Firstly, the transportation of a vast amount of sewage (the content of dry matter 2-5%) requires a lot of money. Secondly, soil, underground and surface waters are infected with invasive, toxic elements. Thirdly, it leads to concentration of nitrates, copper and zinc in grain, grass and water resources. As a result, some U.S. states, for example, have banned the application of unprocessed bird droppings as a fertilizer [1].

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Biotechnological disposal using methane digestion, thus, is one of the right solutions for recycling poultry waste. Raw materials, gained with the help of this process, can be widely used in agriculture as an environmentally friendly fertilizer, methane, animal feed additives and fuel gas.Like any other biological process, composting needs some factors to ensure satisfactory results, including the most important ones: temperature, moisture, pH and chemical composition of the material; the latter is the most challenging to be controlled and thus leads to varied results during the process **[2].** (Orrico Junior et al., 2010). Huang et al. (2008) and Perez et al. (2002) showed that the composition of the fibrous fraction of plant materials (cellulose, hemicellulose and lignin) significantly influences the degradation rate of these compounds, mainly when the lignin comprises the major part of the substrate **[3].**

The article provides studies on the production of high-quality organic fertilizers while production of other processed products requires more resources and costs.

WHY CHICKEN MANURE?

According to statistics, one poultry farm in Uzbekistan annually throws out up to 6000-7000 tons of bird droppings. During a year one chicken gives 6-7 kg of dung **[4].** The poultry farm "Silver Eagle Plus" LLC, where the research has been carried out, receives about 8640 tons of poultry waste per year. The poultry farm with 10 thousand chickens produces 2 tons of excrements per day **[5].** Fresh manure contains about 76% water. 1000 hens produce 65 tons of fresh manure, on the dry basis as sold (approximately 30% water), 25 tons is produced by 1000 hens per year **[6]**.

The utilization of organic masses in such amounts is problematic for poultry farms, bird droppings are accumulated near them, lose their valuable qualities and pose a serious ecological threat to the environment.

Fresh chicken droppings contain 1.5-2.5% nitrogen, 1-2% phosphorus and about 1% potassium (Table 1).

Table 1: Chemical composition of bird droppings, %

Manure	H_2O	N	P_2O_5	K_2O	CAO	MGO	SO_3
Chicken	56	1,6	1,5	0,8	2,4	0,7	0,4

Its chemical composition is 3-4 times richer than cattle manure. Poultry manure contains the following chemicals (Table 2) **[7]**:

Table 2: Chemicals found in poultry manure

- manganese - zinc - cobalt - copper - iron - nitrogen	- potassium - magnesium - phosphoric acid - boron - brimstone

The amount of these substances depends on the diet and the way the chicken is kept as well as its age. Fresh manure contains no more than 40% water. Its acidity does not exceed 7 pH.

According to Averyanov, the Russian scientist, the dung contains microelements: 100 g of dry matter contains 15-38 mg of manganese, 12-39 mg of zinc, 1-1.2 mg of cobalt, 1-2.5 mg of copper and 300-400 mg of iron **[8]**. Most of the food elements in bird droppings are in water-soluble form.

Drying of chicken droppings in cage rearing takes about 8 hours 10-12%, in 12 hours - 13-16%, in a day - 27-32%. Bedding manure is obtained at the floor rearing, drying of which is faster, reaching 50% in 12 hours.

Chicken manure as a source of plant nutrients has long been recognized around the globe. Besides being a valuable source of plant nutrients, chicken manure is a significant soil conditioner, and it enhances the soil's moisture-holding and nutrient-holding capacities. Due to the high concentration of organic components and their gradual release, the effect on the harvest can be observed in the next 2 or 3 years.

Many farmers do not use the manure as a fertilizer because they do not know how to use it properly. When stored in large piles, bird droppings heat up and release ammonia that evaporates quickly. In 2-3 months, nitrogen losses may reach 30-50%. Different methods of treatment are used to reduce the loss of nutrients when storing the manure.

BIOTECHNOLOGICAL PROCESSING METHODS OF POULTRY WASTE

Cleared or flushed droppings can cause problems unless they are processed instantly into something useful or valuable. Fresh dung, as well as the liquid released from it, kills the insects living in the soil without which the regeneration of soil is impossible.

According to the World Health Organization (WHO), litter and sewage of poultry farms can be the driving force behind the transmission of more than 100 agents of infectious and invasive diseases, including zoonosis **[9]**. Besides, the organic waste itself

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can serve as a favourable habitat for the development and long-term survival of pathogenic microflora, contain increased amounts of heavy metals, pesticides, drugs, radioactive substances, weed seeds and other contaminants.

Under the Decree of the President of the Republic of Uzbekistan of 13.11.2018, N PP-4015, "On additional measures for further development of poultry farming" considering the existing problems that impede the further development of the sphere, one of which is a low level of poultry waste processing, to take measures to set production of equipment, inventory, and mechanisms necessary for production and processing by the end of 2022 **[10]**.

Organic fertilizers derived from manure should be free from pathogenic microorganisms, resilient eggs and helminth larvae. The efficiency of organic fertilizer decontamination is monitored using microbiological methods to ensure the survival of indicator (sanitary) microorganisms: bacteria of E. coli group, staphylococcus and spores following the instruction on laboratory control of treatment facilities at animal breeding complexes, instructions for veterinary disinfection of livestock facilities and veterinary and sanitary rules of preparation to be used as organic manure fertilizers, manure and effluents for infectious and invasive diseases of animals and poultry **[11]**.

Decontamination of organic waste is considered to be effective in the absence of a 10 g (cm3) sample of E. coli, staphylococcus, enterococcus or aerobic spore-forming microorganisms, depending on the type of infectious agents in a triple study.

Bacteriological and parasitological control of manure as well as compost based on it is conducted by specialists from veterinary laboratories.

The current technological level of the poultry industry requires an innovative approach to the processing of bird droppings and the production of organic fertilizers from them, the essence of which is the introduction of low-waste technologies.

There are several ways to process organic poultry waste:

- aerobic fermentation;

Straw or peat is interspersed with droppings and rots in warm weather for a month and a half. This method requires special sites, techniques and large quantities of peat, straw and other materials that reduce moisture. If the technology is followed, good quality biohumus is obtained, but up to 30-40% of nutrients are lost as gases. Peat is poured on the site with a layer of 30-40 cm (using loaders, tractor trailers, spreaders, dump trucks), on top of it - dung (with a moisture of 75% and peat 65% ratio 1:1). Then everything is stirred and a storage clamp is formed using a bulldozer. The width of the compost clamp is 3-4 m, height is 2 m, length is at least 6-8 m. The top of the storage clamp is covered with peat. During the cold season the compost is kept for two months, during the warm season - for one month. Shredded straw or sawdust as bedding in factories can be a reliable method of preserving nitrogen in the manure. Sometimes additional enzymes are added to the compound to accelerate rotting and fermentation. Adding 6-10% superphosphate or about 20-30% soil to the manure before storing will prevent nitrogen loss **[12]**. It should be stored in a dry place to reduce losses. In order to obtain proper fermented manure, it is necessary to stir it from time to time. This will improve the flow of oxygen and atmospheric nitrogen to the inner layers of the pile, so that the bacteria will perform their work more efficiently.

The main disadvantages: it is impossible to use the area, which is planned for planting in the next 3-5 years, because the liquid flowing from the pile not only kills worms and other earthlings, but also greatly changes the chemical composition of the soil, causing its infertility; it is necessary to remember that prolonged storage leads to a deterioration of its properties; use without special training and treatment can cause damage, when applied in a pure form under the potatoes, etc.. When applied in its pure form under potatoes, etc., root vegetables can worsen their taste (it is recommended to apply in autumn and only in the form of compost); during rotting, gases and ammonia are released into the atmosphere.

- drying;

During the drying process, moisture is removed from the dung by various means, at least to the point where the bacteria completely stops its activity. Primary dehydration is carried out using a separator that reduces the moisture content to 50-70%. The material is then either turned into granules and dried with a drum dryer, or immediately fed into a drum dryer, which reduces moisture to 15-30%. Due to the high temperature, pathogenic bacteria as well as worms in any form are killed during the processing. Drying of dung is used to make dry pellets for fertilizer (dried manure) or fuel for solid-fuel heaters and heating devices.

Disadvantages: it is essential that the dry material is immediately packaged in an airtight polyethylene package, and the air in the package must also contain a minimum of moisture. Despite the fact that previously all bacteria have died, they are in the air, and under these conditions they will reproduce quickly.

- vermiculture;

The technology of preparing vermicompost (getting biohumus) on the basis of bird droppings is carried out by rearing the red Californian worm and other rainworm subspecies (E. foetida) in the prepared compost. Substrates for vermicomposting are preliminary prepared by biothermal treatment and then used according to the adopted technology **[13]**.

Vermicomposting is carried out in the places with a set of technological equipment that provides optimal parameters of the atmosphere (temperature 20 ± 2.5 ° C, humidity of the compost mass - not more than 70 %, pH - 7.0 ± 0.5) for the uterine vermiculture, which is introduced into the compost in the amount of 30-50 specimens per 1 kg of substrate **[14]**. Vermicompost is ready to be consumed in 4-5 months after laying the California worm in the substrates.

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Disadvantages: the process requires a lot of time and several processes; before adding the worms to the litter, it should already be processed by one of the existing methods.

- anaerobic digestion

This method solves several tasks at once: collection and processing of poultry farm waste with the capture and neutralization of harmful biogas, obtaining environmentally friendly fertilizers, as well as methane for mini combined heat and power unit, fuel gas for motor vehicles, ensuring the operation of a freon-free cooler, production of "dry" ice, soda, etc. **[15]**. In 1998, there were more than 800 (including 24 large) bioenergy plants operating on manure in Europe **[16]**. In China, India and other Asian countries there are more than 3 million of them. The application of the technology is constrained by the lack of investments, as well as the absence of basic structures. This method is also used to produce biogas, which is released during the processing of organic waste. As a result of biogas production, the remaining waste contains 2-4 times more basic nutrients than conventional organic fertilizers. In addition, the organic substance produced by this method contains more humic acids, plant growth stimulants, vitamins, amino acids, etc. The biofertilizer obtained by this method is of the highest quality, and the generated methane can be used as a fuel and energy source.

Disadvantages: biogas is convenient for obtaining biohumus and fuel in the private sector, but requires a capital investment and technological improvements.

Organic fertilizer obtained by anaerobic fermentation on the territory of the poultry farm in Tashkent region

Silver Eagle Plus LLC (OOO) poultry farm in Tashkent region has 6 poultry houses with cage rearing. 4 poultry houses for 120000 heads, which work at full capacity, produce up to 24 tons of manure per day (Table 3). According to M.M. Tashkuziev each chicken is capable of producing about 150-200 g of litter per day **[17]**.

Table 3: Calculation of bird droppings produced by four houses per day

Numberofheads	Droppings (average, day/year)	Total (day/t.)
120000	200	24

Table 4: Calculation of bird droppings received by four poultry houses monthly

Amount of bird droppings (day/t.)	Numberofdays (month)	Total (month/t.)
24	30	720

Table 5: Calculation of bird droppings received by four poultry houses annually

Amount of bird droppings (month/t.)	Numberofmonths (year)	Total (year/t.)
720	12	8640

Thus, 4 poultry houses of Tashkent poultry farm "Silver Eagle Plus" LLC produce up to 720 tons per month and 8640 tons per year respectively (Table 3, Table 4).

Two experiments have been conducted on the territory of the poultry farm under the leadership of the poultry farm manager AsadovI.M.. Straw, tree leaves, sawdust and water in the first experiment have been used in equal quantities as a filler. In the second experiment, no additional organic materials have been employed besides water.

During the tests, it has been found that the smaller the part of the substrate, the better. The larger the interaction area for bacteria and the more fibrous substrate, the easier and faster it is for the bacteria to decompose the substrate. In addition, it is easier to stir, mix and heat without creating a floating crust or sediment. Grinded raw materials have an impact on the amount of gas produced through the duration of the fermentation period. The shorter the fermentation period, the better the material has to be crushed.

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METHANE DIGESTION PROCESS

Methane digestion with free methane emission:

Organic compounds + H_2O→ CH_4+CO_2+$C_5H_7NO_2$+NH_4HCO_3 **[18]**.

Methane decomposition of biomass is caused by three types of bacteria. In the food chain, subsequent bacteria feed on the products of the previous ones. The first type is hydrolysis bacteria, the second is acid-forming bacteria, and the third is methane-forming bacteria. Not only are the bacteria of the methanogenic class involved in biogas production, but all of the three species.

Organic compounds (proteins, carbohydrates, fats) that are found in biomass begin to break down into the simplest organic compounds (amino acids, sugars, fatty acids) under the action of hydrolytic enzymes. This stage is called hydrolysis and proceeds under the influence of acetogenic bacteria. At the second stage, there is hydrolytic oxidation of some of the simplest organic compounds under the influence of heteroacetogenic bacteria, resulting in acetate, carbon dioxide and free hydrogen. The other part of organic compounds with acetate obtained at the 2nd stage forms C1 compounds (the simplest organic acids). The obtained substances are a nutrient medium for meta-forming bacteria of the 3rd stage. Stage 3 runs on two processes caused by different groups of bacteria. These two groups of bacteria convert the nutrient compounds of the 2nd stage into methane CH_4, water H_2O and carbon dioxide.

Factors affecting the fermentation process:

- Temperature; - Ambient humidity; - PH level; - C : N : P ratio;	- Raw material particle surface area; - Substrate feed frequency; - Retarding substances; - Stimulating additives.

Methane bacteria show their vital activity within the temperature range of 0-70ºC. If the temperature is higher, they start dying, except for a few strains that can live at temperatures up to 90º C. At minus temperatures, they survive, but stop their life activity.

While performing the first experiment at the poultry farm, there has been used a hand-made reactor using a thick plastic bottle, gas pipes and pipes for liquid fertilizer outlet (Figure 1). The installation was carried out in accordance with methane fermentation conditions, with sealants to prevent oxygen from entering the container. Heating to 35-38° C and periodic mixing has been required to maintain bacteria life. The generated biogas has been accumulated in a rubber balloon (at the production site - it must be a special storage, gasholder). To apply the derived methane at a plant, the gas undergoes a cleaning system and is supplied to consumers (boiler or electric generator). The reactor operates without air access and it is airtight and not dangerous. Water contained in biomass does not give gas. It has taken 25 days to obtain a biofertilizer, and the gas has emerged on the 3rd day of the test. Organic fertilizer has been obtained in two forms: liquid and solid. The liquid fraction was light brown, while the solid fraction was dark brown. The solid fraction has become crumbled after release from the container. To speed up the process, one could add yeast fermented in water with sugar or thermophilic enzymes (which are extracted in the laboratory). Many European countries add superphosphates and other ready-made enzymes.

Figure 1: Handmade mini-reactor

The fermentation process of the second experiment has been performed in a thick plastic container, where the dung has been thrown and diluted with 1:1 water. The fermentation mass has started on the second day, on the 15th day the fraction has separated, the solid fraction has been at the bottom of the container. The fertilizer of this experiment has become dark grey, more liquid and contained a distinct pungent smell. The biofertilizer has appeared to be overmoistened, lumpy and left a feeling of scum. The fermentation process has taken 15 days in general.

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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On a large scale, the most common industrial method is anaerobic digestion in digesters, where the temperature is regulated, the temperature is fed at different stages and the mass is mixed from time to time.

Application of obtained biofertilizer on Jondor strawberry seeds

The recycled organic waste from the poultry farm has turned into a biomass, which contains a significant amount of nutrients. The main advantage of biofertilizer obtained by anaerobic digestion is the preservation of almost all nitrogen and other nutrients, also a significant proportion of helminth eggs, pathogens and weed seeds are lost in biogas plants.

Two types of pots with meadow soil have been used for further testing of fertiliser efficiency: one of the pots has been fed by the fertilizer from the first trial and the other by the second fertilizer (Figure 2, Figure 3).

Figure 2: Soil for the 1st trial

Figure 3: Soil for the 2nd trial

Stages of organic fertiliser application

1) The soil in pots has been watered. Before top dressing, liquid fertilisers have been diluted at a ratio of 1:20, as the concentration of nitrogen and other substances in it is very high, which may damage the soil and plants. This fertiliser has been used for soil impregnation and periodic watering after strawberry seeds germination.

2) A month before seed settling, the solid crumbled fraction has been used on the pot number 1 from the first experiment (Figure 4). The more liquefied fertilizer has been applied on the pot number 2 (Figure 5).

Figure 4: Solid fertilizer from the 1st trial

Figure 5: Solid fertilizer from the 2nd trial

3) A month later Joydori strawberry seeds are planted and water is poured (Figure 6).

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Figure 6: Joydori strawberry seeds

4) A week later strawberry sprouts have started to appear in the first pot, and 10 days later in the second pot. Seed growth of 12 days has been captured on photos (Figure 7, Figure 8).

Figure 7: Sprouting in 12 days

Figure 8: Sprouting in 12 days

5) Only the soil on the 25th day after the sprouting of Joydori strawberry seedlings has been watered using a liquid fertilizer without touching the plants.

Application of the biofertilizers has resulted in quick humification of plant residues in the soil, helped reduce erosion by forming stable humus and also has increased nutrient content, improved amortization and regeneration qualities of soils. It has been noticed that the activity of earthworms has been increased while applying the biofertilizers.

FINDINGS

The analysis and research carried out at the poultry farm have shown that the trial number 1 using a home-made unit for anaerobic fermentation has taken more time to process manure and additional substrates as opposed to the second. However, the obtained fertilizer from the home-made reactor has a crumbly structure, a homogenous dark brown color and no pungent smell. The fertilizer of the second trial has been less effective: it has been overmoistened, sticking together in lumps, scum and has had an unpleasant smell.

In practice, biofertilizer application has revealed that the fertilizer produced by the bioreactor has proven to be more productive; germination of strawberry seeds started faster and contained more sprouts than in the second pot.

It is important to note that temperature control in the experiments has been the most critical factor in the fermentation stages of bacteria.

The study has found that the digestion process of bird droppings produces not only valuable, highly concentrated organic fertilizer without nitrites, weed seeds, pathogenic microflora, but also biogas. Such fertilizers enhance soil fertility, provide plants with easily accessible nutrients and reduce mineral fertilizer consumption.

CONCLUSION

Uzbekistan has sufficient natural, labor and investment resources for the agricultural development. Establishment of biotechnological processing industry of agricultural wastes solves a number of principal problems influencing each other. First of

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all, ecological problems related to the reduction of ecological harm caused by animal, poultry and plant production wastes. Secondly, it is economic, which makes it possible to produce high-quality organic fertilizers that increase soil fertility and yields. Thirdly, it can be energy-efficient, aimed at creating less expensive energy resources. Finally, it is a very important social component, which helps create new jobs when new production facilities are put into operation.

The processed organic waste can be converted to fertilizers in agriculture. This will reduce the use of chemical fertilizers and reduce the impact on ground water. Biogas production makes it possible to prevent methane emissions into the atmosphere. Methane affects the greenhouse effect 21 times more than CO2 and has been in the atmosphere for 12 years **[19]**. Methane capture is the best short-term way to prevent global warming. Biotechnology based on the use of biogas production waste as a highly efficient, environmentally friendly organic fertilizer is one of the promising solutions for bird droppings recycling. Application of organic fertilizers on alkaline soils leads to neutralization of soil and increase of its humidity, which is especially important for arid regions of Uzbekistan. It is necessary to raise the farmers' awareness of bioreactor efficiency.

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SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
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EXPERIMENTAL STUDY OF THE EFFECT OF HUMANIZATION OF STUDENTS' PHYSICAL EDUCATION ON THE SUCCESS OF EDUCATIONAL ACTIVITY

Gilijova Arzigul Mametmyratovna
Teacher of Urganch State University

ANNOTATION

In this article, Training of physical education and sports specialists in physical education and sports, learning and development of the physical, psychological and functional capabilities of the individual, development of the organism and formation of its common citizenship, formation of a spiritually rich person who can meet the demands and tasks of the time, Eastern and Western, European and Asian cultures healthy, high morale, who can appreciate the spiritual and material values of the nation, about what goals to set and what tasks should be carried out in order to optimally educate the next generation in the period of convergence such issues are disclosed.

KEYWORDS:*Physical education, Islamic culture, general culture, jIslamic statepedagogical justice, level of development of physical qualities, theory of physical improvement, universal principles, physical maturity, biological, moral.*

It is the duty of parents, teachers, schools, and all humanity to society to educate today's young generation as a well-rounded, intelligent, dignified, humble, civilized citizen. The ultimate goal of education is to educate a competent, comprehensively cultured person who can overcome political, economic and spiritual crises during the transition of society to market relations. Because if the issue of education is not prioritized, it will be an obstacle to the development of the state as much as possible. Training of physical education and sports specialists is carried out in accordance with state training standards for physical education and sports, learning and development of physical, psychological and functional capabilities of the individual, development of the organism and formation of its general citizenship.[1].

Therefore, the problem of forming a spiritually rich person who can meet the demands and tasks of today's time is one of the urgent problems facing our troubled country today. Therefore, education is a social phenomenon, a universal business. The reason is that the future of the entire nation and state is in the hands of the young generation. In the era of convergence of Eastern and Western, European and Asian cultures, questions arise about what goals to set and what tasks to implement for the optimal upbringing of the next generation. In our opinion, the goal of educating the young generation is to bring up cultured people who are well-educated, healthy, highly spiritual, who can appreciate the spiritual and material values of the nation, and who can contribute to raising the value of the mother tongue.

- introduction of world and local cultural achievements into educational plans;
- creation of necessary conditions for education, development and professional training of a person on the basis of scientific achievements and national values;
- clearly defining the effective methods of education and upbringing of young people;
- drawing up educational plans for raising boys and girls according to gender characteristics;
- to conduct education for all generations in any field only on the basis of the mother tongue;
- creating the content of educational activities in accordance with national interests;

[1]Golikova E.M. Pedagogical concept of sotsialnogo razvitiya studentsov v sisteme adaptivnogo fizicheskogo vospitaniya: dissertation ... doktor pedagogicheskih nauk. - Orenburg, 2018. - 387 p.

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- organization of all educational activities at the level of promotion of national culture. It is possible to raise every person to be an educated and conscientious citizen by thinking about problems and solving them effectively. Through the implementation of these tasks, i.e., national education, the national character of the entire Uzbek people is formed. The uniqueness of our national education comes from the demands of the socio-economic life of the people.

In general, we should understand the concept of "giving national education to young people" as the formation of good qualities in young people according to national characteristics. In other words, national education is to inculcate the best experience and good qualities that the people have collected and selected over the centuries into the mind of the young generation, to form the child's attitude to the environment, worldview, attitude to life, and correct behavior. In this regard, taking into account that the behavior, feelings, and thinking of the young generation depend on the socio-historical conditions in which they live, it is necessary to use reasonable methods in accordance with their consciousness, will, and creative abilities.

Physical qualities are the properties of an organism that provide movement. The main physical qualities of students are endurance, strength, agility and dexterity.

Endurance is the ability to perform work at a high level for a long time without reducing its effectiveness. Patience can be general or special. It is based on the physiological capabilities of the body. Stamina development tools include: sprinting, skiing, hurdles, swimming, sports and action games.

Strength is the ability to overcome external resistance or resist them due to muscular forces. Strength development is achieved through exercises that increase the strength level of the muscles through different pulls. For this purpose, physical exercises for weight lifting and transportation, strength training on gymnastic shells and simulators, individual weight training are used[2].

Agility is the ability to perform motor actions in the shortest possible time. The development of agility is achieved through physical exercises that require quick movement reactions and high speed of movement. For this purpose, various speed and strength exercises (short-distance running, jumping, turning, etc.), as well as exercises describing basic and dynamic changes in the situation (sports and action games, exercises over obstacles, etc.) are used.

Agility is the ability to coordinate actions, to coordinate them according to the purpose, to organize them as a whole, to direct the action taking into account the received action, or to reconnect them according to changing conditions.

Agility develops in two ways. The first is to systematically fill the student-youth experience with new forms of movement, and the second is to overcome coordination difficulties that arise in changing conditions. The first way is achieved in the process of learning new physical exercises, which requires the elimination of anomalies that occur in the initial stages of the formation of motor skills and coordination of movements. The second way is by introducing an unusual factor into routine physical activity that places additional demands on movement coordination. For this, physical exercises from gymnastics, hurdles, arm wrestling, sports and action games are used.

Physical education is interpreted here as a part of the culture of human society, which affects the personal development of a person and the knowledge of physical education. In the textbook "Theory and Methodology of Physical Education" for physical education institutes (edited by L.P. Metveev and A.D. Novikov), a whole chapter is devoted to the physical education of students.[3].

In the classes of sports and action games, agility, dexterity, general and fast endurance, spatial orientation, teamwork skills, stability, decision-making, initiative and resourcefulness, support of mental and physical activity, development of learning and struggle are aimed at suppressing emotional strength. Sports and action games are

[2]Volkova A.N. Pedagogical technology popularization olympiyskikh vidov sporta, ne polzuyushchixsya interesom u podrostkov: dissertation ... candidate pedagogicheskikh nauk. - Moscow, 2018. - 273 p.

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organized in the open air and in gyms. Preparation and final parts of the lesson are held as part of the line, the main part - as part of the line or in units (teams). Gymnastics and athletics training focuses on the development of agility, strength and endurance, flexibility, spatial orientation, practical movement skills, courage and decision-making, personality and attractiveness.

Classes are held in gymnasiums and camps, sports halls or specially equipped buildings, educational complexes, as well as places. The preparatory section includes routine approaches and attention exercises, walking and running exercises, general development exercises performed in one place, a set of optional exercises, two-person exercises, as well as exercises to improve the "jumping" position, special and jumping exercises. In the preparatory section, general developmental exercises can be performed on a gymnastic wall, a gymnastic bench, a ball, a stick, or a dumbbell with or without music.

The main part of the lesson includes physical exercises on the bridge, beam (two wooden gymnastic apparatus with parallel supports), vaulting and vaulting and complex exercises, laundry, weightlifting, climbing, movement games and relays. Exercises using washing, physical exercises in gymnastic shells with the help of full and partial preparatory exercises, optional exercise complexes are taught in departments. Exercise in gymnastics is confirmed by their frequent repetition. Complex exercises are first broken down into parts and then perfected as a whole. To increase the physical load and intensity, gymnastic exercises with the participation of all students at the same time, in turns, rows, columns, with each other or in several streams, in pairs,

In this section of this research work, the purpose, tasks, content, and stages of experimental work to achieve the goals and tasks of our research are explained.

In order to increase the effectiveness of the process of humanizing physical education of students, we implemented the following procedures based on the studied scientific literature in order to test and implement a set of theoretical models and pedagogical conditions. developing a pilot program; - selection of specific methods and parameters for conducting experimental work and measuring the obtained data; - to determine the sample representative of the studied population; - conducting experimental studies in a small number of subjects; - carrying out stages of determining and forming experience; - quantitative and qualitative analysis of results; - description of received data and their interpretation; - determining the effectiveness of the experiment.

Based on its objectives, the experimental work process included three stages - the development of the research concept, its implementation, and the implementation of the findings. The idea of scientific research is an innovation introduced into theory and practice as a result of study, an idea about ways to achieve this goal. Within the framework of the formulated hypothesis, we introduce a set of pedagogical conditions, basic ideas, educational programs that ensure the effectiveness of the physical education process of students.

At this stage, we studied the object of research, identified the topic, defined goals and objectives, developed research problems.

In order to check the effectiveness of the set of pedagogical conditions and the model of humanization of physical education of students, we conducted a detailed experiment in several stages.

As criteria and indicators of the effectiveness of the experimental methodology, we put forward the following:

- the level of formation of students' knowledge (according to examples of mastering the humanistic nature of physical culture);
- the level of skills of applying health-giving methods, independent development of physical qualities;
- personal characteristics (level of physical education; changes in values and attitudes; health; intelligence; humanistic outlook).

The results of the identification stage showed that the traditional system of conducting physical culture classes is not effective enough. The degree of humanization of the process of physical education of students is clearly insufficient.

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In order to increase the effectiveness of the studied process, an experimental program for humanizing the physical education of economic university students was developed and implemented, the basis of which was the technology of introducing a set of pedagogical conditions.

This technology is primarily aimed at changing the value-motivational sphere of the student's personality, forming a positive attitude to moral standards; changes in the field of self-regulation; for self-knowledge and self-improvement.

The development and implementation of experimental technology was carried out within the humanistic (phenomenological) paradigm, which considers teachers and students as equal subjects of the educational process.

The undoubted effectiveness of our work in achieving the goal was confirmed by the use of a 24-hour seminar "Humanistic content of physical culture" in experimental groups, the purpose of which was to develop students' ideas about the value of physical education and sports activities. The results of the formative stage of the experiment, obtained with sufficient reliability, confirm the correctness of the hypothesis put forward in the research: the effectiveness of the process of humanizing the physical education of students can be ensured by implementing and introducing a set of pedagogical conditions.

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THE EXPRESSION TOPONYMS IN THE FUNCTION OF NUCLEAR COMPONENTS IN ENGLISH AND UZBEK LANGUAGES

Jumatov Rashid Yangibaevich
PhD Student at Samarkand State Institute of Foreign Languages

ABSTRACT

This article is dedicated to the comparative study of toponyms in the English and Uzbek languages, in which the place names functioning as nuclear components are analyzed based on modern linguistic methods. In particular, the syntactic relations of toponyms in the sentence are explained on the basis of junctional models, and their morphological features are revealed through component models. Also, their similarities and differences in these unrelated languages have been identified. This article may be useful for linguistic researchers and those interested in toponymy and/or functional syntax.

INTRODUCTION

As noted by N. Mahmudov, it is not appropriate to look at the language, which is a miraculous and rare gift that nature has given to mankind, as a plain system and set of living signs necessary for thinking and to approach it only as an emotionless, soulless tool [4, 88]. Therefore, today, our linguistics faces the issue of systematically studying the role of toponyms in human life, their special status in human thinking and the unique "mission" of this type of units.

The study of place names can be an object of geography, history and linguistics. Linguistics is one of these areas that deals with extensive and deep research of toponyms [1, 12].

LITERATURE REVIEW

So far, a number of works have been carried out on the study of toponyms. It should be acknowledged that S. Koraev laid the foundation stone for the wide development of this direction in our country with his work "Toponymics". In this field, some aspects of proper nouns were studied in monographic research works and scientific activities of scientists such as N. Makhmudov, E. Begmatov, Z. Dosimov, D. Khudoyberganova, D. Yuldashev.

Scholars have approached toponyms from different perspectives and classified them based on several principles. In particular, lingua-cultural, cognitive, etymological, sociolinguistic, functional and semantic aspects of toponyms have been studied more widely. For example, A.V. Urazmetova emphasizes the secondary naming of toponyms and the scientist includes "place names given on the basis of descriptive expression in the group of secondary toponyms" [8, 56].

Since the emergence of "transformational grammar" in the world of linguistics, in the course of the development of structural and functional syntax, many linguistic studies have been carried out about the external and internal structures of the sentence. N. Chomsky tried to analyze the external and internal (surface and deep structure) structure of the sentence based on different methods of transformation [10]. The passive participle indicates that the internal structure of the sentence is expressed in the definite participle. For example, "The bear was chased by the lion" (surface structure), "The lion chased the bear" (deep structure) [11, 207] explains the sentence structure by

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transformation. In this regard, Ray Jackendoff "emphasizes that transformational grammar has the ability to reveal the essence of human thought."

If we pay attention to this idea, the initial appearance as a result of the formal connection of syntactic elements in the sentence device is recognized as an internal structure. The problematic aspect of the definition given by N. Chomsky is that it does not differentiate between external and internal structures of exactly one sentence structure (without transformation into another form).

P.H. Matthews expresses the following opinion about the internal structure of the sentence: "The internal structure is an expression of the sentence syntax that differs from the external device by its variable criteria" [12]. Also, in the sentence device "Children are hard to please" children - subject, “to please” is a determinant of the attribute “hard” which constitutes the external device of this sentence, according to the internal structure of the sentence, the syntactic unit “children” is the object of the word please and together they perform the function of possessive in relation to “hard”, he cites the following transformation view of this sentence as an internal structure: "To please children is hard" [12]. Here, too, it is noticeable that Chomsky's opinion is relied on, that is, the existence of an internal and an external structure in the same sentence is not stated.

Surider Deol comments on this as follows: “ …deep structure in the study of language is an underlying semantic content of a sentence. Surface structure of a sentence on the other hand is what we make of the sentence. If we expand this idea to cover all aspects of our life, we can say that surface structure (ideas, aspirations, actions) is the medium through which we make sense of our deep structures” [13]. With this, the scientist shows that the internal structure forms the semantic content of the sentence, and the external structure relies on individual factors from a sociological point of view.

METHODOLOGY

Having studied the opinions of linguists about the concept of the external and internal devices of the sentence, we were sure that the principles of distinguishing the external and internal structures of the sentence were not developed on the basis of specific linguistic methods. Until now, the opinions of researchers are not consistent with the fact that problems of syntactic content arise from word forms and their lexical meanings. Some linguists recognize lexical meaning as the basis of grammar (Barkhudarov), others deny it, and a third group of researchers do not recognize it as a linguistic category [9; 8-23; 13; 14].

Among such opinions of linguists, A. M. Mukhin's statement about the external and internal device attracted our attention: "the external device of a sentence is understood as the analysis of its content by dividing it into components... and the internal device is determined by the syntax analysis of this sentence" [7, 198] . So, according to the principle of A. M. Mukhin, exactly one sentence form can have both an internal and an external device. This allows young researchers like us to analyze sentences correctly. Now let's cover the definition of A.M. Mukhin in more detail. In order to determine the external device of the sentence, the mutual syntactic relations of the syntactic units involved in it are explained using junctional models, and on the basis of these models, the differential syntactic features of the syntactic units, that is, the composition of the components and their morphological characteristics, are revealed using the component models.

When analyzing the sentence structure separating into components, there is a need to identify syntactic relationships and distinguish syntactic units from each other. The syntactic relations determined between the syntactic units provide a wide opportunity to determine the differential syntactic features of the components involved in the sentence structure, and the method of contrast is used for this.

DISCUSSION

The distinctive features of the nuclear predicative relationship are that they can form a sentence that expresses an independent idea without being subject to other syntactic relationships and it connects two nuclear components

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
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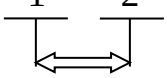
with equal rights [3, 36]. Therefore, the nuclear predicative relationship is given in the form of a sign [ ], which is bidirectional and has a two-way index, in the representation of junction models, due to the fact that two mutually equal nuclear components are organically connected. Also, this syntactic connection is a feature that distinguishes it from other syntactic connections due to its existence between the components that make up the main device of the sentence. Other syntactic relations cannot form the main center of the sentence in terms of construction. Because syntactic relations other than nuclear predicative relations are non-nuclear relations.

We fulfill component analysis of the surface structure of the following sentences:

1. The White House was smaller [18, 126].

2. Indian Island was news! [15, 2]

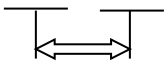
Both of these sentences fall into the same junction and component model as they are simple compound sentences, but their morphological features are different.

1 2 (1) The White House was smaller.	1 2  J.M.	NP_1 . NP_2 K.M.
1 2 (2) Indian Island was news!		

At this point, we found it necessary to give an explanation of the symbols in the component model. The symbol NP_1 denotes the subject of the sentence (N –nuclear, P_1 – predicated – determination of the subject of the sentence through a predicate), and the symbol NP_2 denotes the predicate of the sentence (N –nuclear, P_2 – predicating, represents the meaning of the element forming the center), ÑD is a non-nuclear dependent component and represents any secondary part of a sentence [6, 99]. An object, attribute and adverbial modifier, called secondary parts, are subordinate to another clause and cannot exist without a primary parts. Therefore, combining an object, attribute and adverbial modifier and naming them generally as a subordinate component (ÑD) makes it easier.

In the above sentences, if the goal is to determine only the subject and predicate, their component models remain the same. Therefore, it is necessary to explain aspects of their morphological expression.

The component models of the examples analyzed above can be expressed as follows:

1 2 *(1) The White House was smaller.*		J.M.	$\underline{NP_1}$. $\underline{NP_2}$ S cA	K.M
1 2 *(2) Indian Island was news!*			$\underline{NP_1}$. $\underline{NP_2}$ S cS	

The toponyms in the place of the nuclear predicated (NP_1) components in the sentences have the structure of Adjective + Noun, and are represented by (1) the color-based coloronym in the sentence and (2) the toponym based on the origin in the sentence. In both sentences, the nuclear predicating (NP_2) components are complex noun-predicate, the linking verb (c) is combined with the adjective (A) in the first sentence, and the noun (S) in the second sentence.

In the following examples, subordinate components are also involved and simple common sentences are formed:

3. New York City had been selected as the site for the kidnap [17, 84].

4. Times Square presented an extraordinary sight [17, 127].

5. The actual village of Stocklehaven could not be seen [15, 71].

In these sentences, the toponyms representing the names of the city (*New York City*), the square (*Times Square*) and the village (*Stocklehaven*) appear in the function of the nuclear predicated component and connected with

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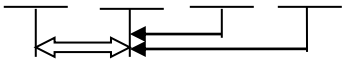
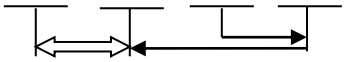
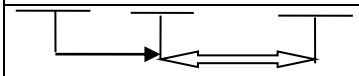
Volume: 7 | Issue: 12 | December 2022 - Peer Reviewed Journal

NP_2 – the action verb in the passive voice (*had been selected*) and the state verb in the active voice (*presented*) and the modal verb in the passive tense (*could not be seen*) on the basis of nuclear predicative relationship. The junction and component models of these sentences will look like this:

(3) New York City had been selected as the site for the kidnap			
	J.M. 3	$\underline{NP_1}$. $\underline{NP_2}$. $\underline{\tilde{N}D}$. $\underline{\tilde{N}D}$ S auxVp$_2$ S prS	K.M. 3
(4) Times Square presented an extraordinary sight			
	J.M. 4	$\underline{NP_1}$. $\underline{NP_2}$. $\underline{\tilde{N}D}$. $\underline{\tilde{N}D}$ S Vf A S	K.M. 4
(5) The actual village of Stocklehaven could not be seen			
	J.M .5	$\underline{\tilde{N}D}$. $\underline{NP_1}$. $\underline{NP_2}$ A SprS m.auxngVinf.	K.M. 5

In the following examples, we observe that the toponyms that are in the function of the nuclear predicated component are connected with the predicate by means of state verbs in the function of linking verbs:

6. Edgeway station looked so isolated [18, 19].

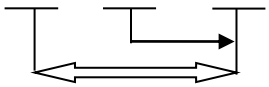
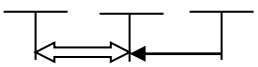
7. Tanjier Island was named after Tanjier, Morocco [18, 97].

To clarify the content of these sentences, we use the substitution and omission methods of the transformation method.

6) Edgeway station looked so isolated. → Edgeway station was … isolated → Edgeway station was in the state of isolation.

7) Tanjier Island was named after Tanjier, Morocco → Tanjier Island got its name from Tanjier, Morocco.

The junction and component model of sentences is as follows:

(6) Edgeway station looked so isolated			
	J.M. 6	$\underline{NP_1}$. $\underline{\tilde{N}D}$. $\underline{NP_2}$ S Adv cVp$_2$	K.M. 6
(7) Tanjier Island was named after Tanjier			
	J.M. 7	$\underline{NP_1}$. $\underline{NP_2}$. $\underline{\tilde{N}D}$ S auxVp$_2$ prS	K.M. 7

The fact that these models clearly demonstrate the differences in the syntactic order, component composition and morphological expression of sentences indicates their advantage in conducting research.

Therefore, the toponyms that replace the nuclear predicated component retain their position even when transformed; they are connected to the nuclear predicating part represented by an adjective or noun using linking verbs; it is also observed that it enters into a syntactic relationship with an independent verb in the passive tense, if the verb expresses a state, it is in the form of a active voice.

In the following examples, the syntactic role of toponyms in place of the nuclear predicating component is analyzed.

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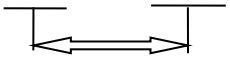
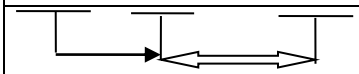
8. The President was for the Secret Service [17, 10].

9. At the top was the stamped address Indian Island, Sticklehaven, Devon [15, 3].

Toponyms are observed only in the function of noun-predicate in the English sentence structure. In this case, they enter into a syntactic relationship with the subject of the sentence using the linking verb "to be". In the sentence 8, the toponym "Secret Service", which means the name of a place, combined with the preposition "for", has taken the place of the nuclear predicating component and is clarifying the position of the syntactic unit the nuclear predicated component "the President". To prove that the toponym in sentence 9 is a nuclear predicating component, we use the transformation method.

9) At the top was the stamped address Indian Island, Sticklehaven, Devon → the stamped address was Indian Island...

The surface structure of sentences can be graphically expressed as follows in junction and component models:

(8) The President was for the Secret Service			
	J.M. 8	$\underline{NP_1}$. $\underline{NP_2}$ S c.prS	K.M. 8
(9) the stamped address was Indian Island...			
	J.M. 9	$\underline{\tilde{N}D}$. $\underline{NP_1}$. $\underline{NP_2}$ Vp_2 S cS	K.M. 9

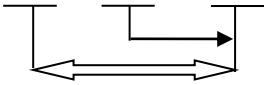
From the analyzed examples, it can be seen that toponyms can be found in prepositional and non-prepositional forms in the function of a nuclear predicating part and in this case they can only be complex noun-predicates since toponyms are characteristic of nouns, they cannot be simple predicates according to the structure of the sentence.

Our next examples are collected from works of art in the Uzbek language, on the basis of which we analyze the syntactic position of toponyms in Uzbek sentence structures, in particular, the occurrence of nuclear components.

1. Samarqand zebo shaharmi? [20, 82]

2. Ozarbayjon – sehrli o'lka [20, 44].

In these sentences 1, 2, the toponyms, which are the nuclear predicated parts, represent the names of cities and waterways, and are connected to the adjective + noun syntactic units, which are the nuclear predicating components, on the basis of the nuclear predicative relationship. Such statements can be indicative, interrogative and negative. Below, we reveal the component structure of these sentences, syntactic relations of syntactic units and features of morphological expression using junction and component models:

1) Samarqand zebo shaharmi? *2) Ozarbayjon – sehrli o'lka.*			
	J.M. 10	$\underline{NP_1}$. $\underline{\tilde{N}D}$. $\underline{NP_2}$ S A S	K.M. 10

It is known from the models that the component structure and syntactic relations of both sentences are the same and the nuclear components are represented by nouns. Also, sentences contain subordinate components represented by adjectives, which are connected to the nuclear predicating syntactic unit on the basis of a subordinate relationship.

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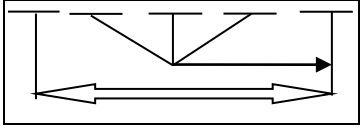
In the next sentence, the subordinate components that illuminate the features of the toponym, appear as homogeneous parts of the sentence.

3. Amu go‘zal, ammo sehrgar, jodugar shahar [16, 154].

It is possible to prove that the subordinate components in the given sentence are connected on the basis of a coordinative relationship and have equal syntactic relationship using the transformation method:

3) Amu go‘zal, ammo sehrgar, jodugar shahar → Amu go‘zal ... shahar → Amu sehrgar shahar → Amu jodugar shahar.

From the derivation of the transformation, it became clear that it is possible to connect each of the subordinate components to the dominant component without any lexical and grammatical changes, leaving out the others. The junction and component model of this sentence looks like the following:

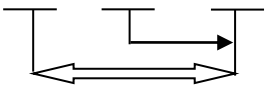
(3) Amu go‘zal, ammo sehrgar, jodugar shahar.			
	J.M. 11	$\underset{S}{NP_1} \cdot \underset{A}{IHÑD} \cdot \underset{cjA}{IIHÑD} \cdot \underset{A}{IIIHÑD} \cdot \underset{S}{NP_2}$	K.M. 11

In this sentence, we saw that the toponym in the function of the subject is attached to a predicate expressed by one original adjective, two derived nouns and a predicate expressed by a countable concrete noun in the singular form.

4. Ko‘yki – vodiyning ko‘rki [16, 81].

5. Orol O‘rta Osiyoning Baykali [16, 175].

The structure of sentences 4-5 is very similar to the structure of the above sentences; the difference is that the subordinate component is expressed not by an adjective or a noun in the common case, but by a noun in the possessive case. In other words, a possessive toponym is connected to a noun-predicate with a demonstrative determiner by means of a nuclear predicative relation. The syntactic and morphological features of sentences are as follows:

4) Ko‘yki – vodiyning ko‘rki. *5) Orol O‘rta Osiyoning Baykali.*			
	J.M. 12	$\underset{S}{NP_1} \cdot \underset{Sps}{ÑD} \cdot \underset{S}{NP_2}$	K.M. 12

Let's move on to the analysis of the next sentences expressed by the nuclear predicated toponym.

6. Istanbul dengiz sathidan ancha baland [19, 60].

7. Istanbul dengiz yoqasida [19, 60].

8. Nurbuloq ham shu yo‘lda [21, 188].

In the following sentences 6, 7, 8, the possessive toponyms Istanbul (6, 7), Nurbuloq (8) are in the singular form and in the common case and are syntactically connected with nuclear predicating components as the concrete adjective “baland” (6), the accusative form of the noun “yoqasida” (7), “yo‘lda” (8). This information is reflected in the following models:

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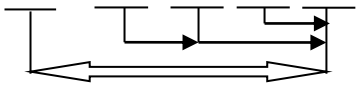
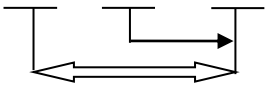
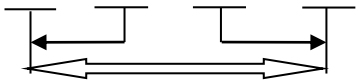
6) Istanbul dengiz sathidan ancha baland.			
	J.M. 13	$\underset{S}{\underline{NP_1}} \cdot \underset{S}{\underline{ÑD}} \cdot \underset{S_{dan}}{\underline{ÑD}} \cdot \underset{Adv}{\underline{ÑD}} \cdot \underset{A}{\underline{NP_2}}$	K.M. 13
7) Istanbul dengiz yoqasida.			
	J.M. 14	$\underset{S}{\underline{NP_1}} \cdot \underset{S_{ps}}{\underline{ÑD}} \cdot \underset{S_{da}}{\underline{NP_2}}$	K.M. 14
8) Nurbuloq ham shu yo'lda.			
	J.M. 15	$\underset{S}{\underline{NP_1}} \cdot \underset{prtc}{\underline{ÑD}} \cdot \underset{P_{dm}}{\underline{ÑD}} \cdot \underset{S_{da}}{\underline{NP_2}}$	K.M. 15

The toponyms that come in the place of the nuclear predicated component are connected not only to the noun predicate, but also to the verb predicate. We observe this in the following examples:

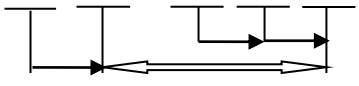
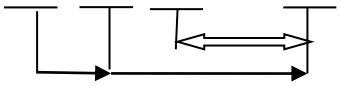
9. Bo'tana Amu keng yoyilib oqardi [16, 154].

10. ... jar tagida qaynab oqqan Shodasoy ko'rindi [16, 261].

The toponyms in the given sentences acquire a syntactic relationship based on the nuclear predicative relation to the nuclear predicating component represented by an independent intransitive verb in the active voice "oqardi" (9) and the transitive verb in the reflexive voice "ko'rindi" (10).

In the analysis of factual examples collected from works of art, we did not observe that the toponyms appearing in the place of the nuclear predicating component are associated with the transitive verb in the exact relative form in the place of the nuclear predicating component.

The junction and component model of these examples is different from the above.

9) Bo'tana Amu keng zozilib oqardi.			
	J.M. 16	$\underset{A}{\underline{ÑD}} \cdot \underset{S}{\underline{NP_1}} \cdot \underset{Adv}{\underline{ÑD}} \cdot \underset{Vp_1}{\underline{ÑD}} \cdot \underset{Vf}{\underline{NP_2}}$	K.M. 16
10) ... jar tagida … Shodasoz ko'rindi.			
	J.M. 17	$\underset{S}{\underline{ÑD}} \cdot \underset{Adv}{\underline{ÑD}} \cdot \underset{S}{\underline{NP_1}} \cdot \underset{Vf_{rf}}{\underline{NP_2}}$	K.M. 17

It is observed that in Uzbek sentences, words made from toponyms and compounds with toponyms also appear in the possessive function.

11. Kogondagilar ularning kelishini bilishar ekan [16, 266].

12. Samarqanddan ekaningiy yuz-ko'yingiydan maälum [19, 15].

The syntactic unit "Kogondagilar" in the given sentence 11 is in syntactic relation with the transitive verb in active voice, which is a predicate because it means a personal noun formed from a toponym of a syntactic unit. In the

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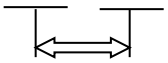
next sentence, the combination “Samarqanddan ekaningiz” (12) is a nuclear predicated component and it has a nuclear predicative syntactic relationship with the nuclear predicating component with the adjective “ma’lum”. It was observed in our examples that in the Uzbek language, a compound consisting of several words can be used as a nuclear predicated part.

In the examples of the Uzbek language, we will consider the place of toponyms in the place of the nuclear predicating component by means of the analysis of the following examples:

13. Italiyaning poytaxti – Rim [19, 70].

14. Oyog‘imiz ostidagi yer – Turkiya [19, 166].

In these sentences, toponyms come in the form of common case and are connected with nouns in common case in the function of a subject based on the nuclear predicative relationship. Their junction and component models are as follows:

Examples	J.M. 19	K.M. 19
13) ... poytaxti Rim. *14) ... yer Turkiya.*		$\underset{S}{NP_1} \cdot \underset{S}{NP_2}$

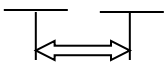
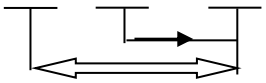
In the following sentences, it is observed that toponyms with in the function of a predicate are combined with the verb “emoq” and in the form of locative and ablative cases:

15. Moskvada ham obi-havo Tataristondagi kabi edi [20, 167].

16. U ... Samarqand shahridan [20, 151].

17. Qizlarning hammasi Bokudan emas [20, 10].

In the given sentences, the syntactic unit “Tataristondagi kabi edi” (15) is connected with an abstract noun “ob-havo”, the toponym with an apposition “Samarqand shahridan” (16) is connected with the personal pronoun “U”, the toponym “Bokudan emas” (17) is connected with the negative form of the verb “emoq”, and all are connected with the collective pronoun. The junction and component models of the examples look like this:

Examples	J.M.	K.M.
15) ... ob-havo Tataristondagi kabi edi.		$\underset{S}{NP_1} \cdot \underset{S_{даги}}{NP_2}$
17) ... hammasi Bokudan emas.		$\underset{S}{NP_1} \cdot \underset{ngS_{дан}}{NP_2}$
16) U ... Samarqand shahridan.		$\underset{S}{NP_1} \cdot \underset{S_{дан}}{NP_2}$

Although almost all of the considered examples fall into the same junction model, there is a difference in their morphological expression. In the Uzbek language, the toponyms appearing in the place of the nuclear predicating component can appear in the forms of the nominative case, locative case, exit case. In this case, they can be connected with the noun or pronoun that replaces the nuclear predicated component based on the nuclear predicative relationship.

Of course, the work does not end with the analysis of the syntactic units represented by the toponyms that have replaced the nuclear components. If these components in the sentence are analyzed by separating them into syntaxemes, it will be possible to identify various non-categorical (additional) differential (differentiating) syntactic-semantic signs in them.

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CONCLUSION

Judging from the above, we can see that the nature of toponyms, which are a reflection of national culture, and their syntactic-semantic features are not fully studied in the case of both unrelated languages. In this article, the semantic realization of toponyms at the syntactic level, the syntagmatic nature of the syntactic signs expressed in the place of nuclear components from their syntactic functions and the paradigmatics of syntaxemes expressed through them are studied by comparing and analyzing them into components and syntaxemes.

In the structure of the sentence, the nuclear components forming the basis of the sentence, expressed in traditional grammatical terms, are a subject and a predicate. The syntactic units that replace the nuclear components are connected to each other based on the nuclear predicative relationship. As A.M. Mukhin noted, "...in order to express an independent complete thought, it is necessary to have a nuclear predicative relationship between the two elements representing the main idea in the sentence, i.e. a subject and a predicate" [5, 78; 6, 48-70]. The mutual syntactic relationship between a subject and a predicate is a nuclear predicative relationship. Hence, we conclude:

1. From the analyzed examples in English language, it can be seen that toponyms can be found in prepositional and non-prepositional forms in the function of a nuclear predicating part and in this case they can only be complex noun-predicates since toponyms are characteristic of nouns, they cannot be simple predicates according to the structure of the sentence.

2. In the Uzbek language, the toponyms appearing in the place of the nuclear predicating component can appear in the forms of the nominative case, locative case, exit case. In this case, they can be connected with the noun or pronoun that replaces the nuclear predicated component based on the nuclear predicative relationship.

ACKNOWLEDGEMENTS

We are very grateful to our scientific instructors and consultants, as well as, scientists in linguistic sphere for their advice and assistance in writing our research work and this article.

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SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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EPRA International Journal of Research and Development (IJRD)
Volume: 7 | Issue: 12 | December 2022 - Peer Reviewed Journal

PREPARATION, CHARACTERIZATION, AND IN VITRO EVALUATION OF LOVASTATIN SOLID LIPID NANOPARTICLES

M.Spoorthy,K.Ramesh ,G.Vijay Kumar
KGR Institute of Technology and Management, Rampally, Kesara, Rangareddy, Telangana, India.

ABSTRACT

Nanoparticles are widely studied drug delivery system because of many benefits like controlled release ability to reach target, smaller particle size, enhancement of therapeutic activity and reduction of toxicity. SLNs (solid lipid nanoparticles) are novel nanoparticulated systems which invited substantial attention as a drug delivery carrier. The design of this study was to develop and evaluate Lovastatin solid lipid nanoparticles, loaded into transdermal patch. Lovastatin, a lipid lowering agent, because of its low bioavailabilty (5%) and shorter biological t ½ is a suitable drug to formulate into transdermal form. SLNs containing drug and non-toxic lipids (stearic acid, cholesterol and glycerol mono stearate), tween 80 and PEG 400 as surfactant and cosurfactant were prepared using micro emulsion process. FTIR study reports indicated that there was no interaction between Lovastatin and other excipients. SLNs were assessed for their particle size, entrapment efficiency, PDI (poly dispersity index) and in vitro studies. Scanning electron microscopy reports shown that the nanoparticles are spherical shape and has size range 132-249 nm. PDI was found out to be in the range of 0.186 – 0.376. Percent entrapment efficiency was between 74.3±0.8 – 93.5±1.8. The SLNs were loaded into a transdermal patch formulated using HPMC in varying concentration. All the prepared patches were assessed for flatness, folding endurance, tensile strength, moisture uptake, moisture content and were determined to be in essential range. The SLNP2 in vitro release rate studies shows better release than remaining formulations (SLNP1 &SLNP3) and it was selected as optimized formulation.

KEY WORDS: *Lovastatin, lipids, SLNs, micro emulsion, transdermal patch.*

1. INTRODUCTION

Lovastatin is [(1S,3R,7S,8S,8aR)-8-[2-[(2R,4R)-4-hydroxy-6-oxooxan-2-yl]ethyl]3,7dimethyl1,2,3,7,8,8ahexahydronaphthalen-1yl] (2S)-2-methylbutanoate falls into the category of statins known as cholesterol-lowering lactones which, in 2011-12, were discovered as being the most widely discovered drug in the universe (Bays, 2001). Lovastatin, a cholesterol lowering agent that is educed synthetically from Aspergillus terreus (a fermentation product) has been determined to minimise both normal and raised LDL-C concentrations. Lovastatin is having plasma half-life of 2 hrs and poor oral bioavailability (<5%) owing to the extensive first pass metabolism. To nullify the first pass effect, the possible methods include transdermal, rectal, buccal, and parenteral routes of administration.

TDDS (transdermal drug delivery system) can be an effective path for the systemic availability of drugs. Transdermal patches are novel drug delivery systems for the skin application to attain a systemic effect. Application of the TDDS system offers many clinical benefits over other routes. It provides a consistent drug release, maintain a steady blood level profile which can reduce systemic side effects, convenient, user complaint, which contribute to improve patient acceptance (Agrawal, 2007). Transdermal delivery can be a potential route for delivery of antihyperlipidemics systemically. As the first pass effect was bypassed, bioavailability can be enhanced. Gastrointestinal irritation that frequently occurs with statin drugs can be bypassed using TDDS. Steady absorption of a drug for a prolonged period eliminates the required for frequent dosing of the drugs which contribute to improved patient compliance (Darwhekar, 2011). Many strategies have been employed to better the transdermal delivery and dermal of drugs, e.g., improving the partitioning between the formulation, increasing the efficient concentration of the drug in the vehicle, the use of chemical penetration enhancers and different physical enhancement methods (Cleary, 2003; Barry, 1983). Furthermore, carrier systems like liposomes, nanoparticles or microparticles have equalled explored (Barry, 2006; Wagner, 2004; Kohli, 2004).

SLNs are biodegradable raw materials which are formed from a matrix of lipids that are physiologically well tolerated (Wissing, 2002). The main advantages of these systems include protection of labile substances from chemical degradation, control of the relinquish of substances referable to the solid state of the lipid matrix, and showing occlusive properties by the

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EPRA International Journal of Research and Development (IJRD)
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formation of films over the skin (Muller, 2000).

TDDS formulations were preferable over the tablet (conventional) or capsule preparations as it has several advantages like it controlled release pattern thus minimizing the dosing frequency (Barry, 2001; Mukherjee, 2005). The main aim of this study was to investigate the influence of SLNs on the penetration and permeation penetration of the lipophilic model drug Lovastatin into skin using stearic Acid, cholesterol and glyceryl monostearate as lipids.

2. MATERIALS AND METHODS

Materials: Lovastatin (Days healthcare), Cholesterol (Moly Chem., Mumbai), stearic acid, Glyceryl monostearate, tween 80, PEG 400, (Fine Chemicals), HPMCK 100M (Yarrow). All other chemicals and reagents were of analytical grade.

Compatibility Studies: It is an important requirement to study the drug and excipients under experimental conditions before preformulation. Drug and excipients incompatibility can alter the bioavailabilty and stability of drugs, thereby, dissembling its safety and efficacy. In the development of a stationary dosage form, the study of drug- excipients compatibility is a crucial process. Early stage of drug-excipents compatability studies helps the selection of excipients that increases the chances of acquiring a stable dosage form.

The FT-IR spectra were by using BRUKER spectrophotometer and recorded the spectrum in the region of 4000-400 cm-1.The samples (drug, polymer and drug polymer mixture) mixed with 200-400 mg of potassium bromide (KBr). The samples placed between the discs in a hydraulic press and compressed by applying 5 tons pressure upto 5 minutes. The prepared disc was placed in the path of light and the spectrum was recorded.

Method of preparation of Lovastatin SLN using microemulsion process: Preparation of SLN (Gasco, 1993) using microemulsion method was performed at a temperature higher than the lipid melting point. Stearic acid, Cholesterol and Glyceryl monostearate as the solid lipids were used for preparing SLN. Tween 80 and PEG 400 was used as a surfactant and cosurfactant. The dispersion medium used is deionised water. Various ratios of lipid, surfactant and cosurfactant were weighed and mixed at a temperature 10^{O}C higher the lipid melting point in a water bath. Deionised water was heated to the similar temperature as a lipid phase and added drop wise under mild stirring to the lipid melt. After each addition the liquid preparation was agitated at 1000 rpm for 10 Sec and checked for clarity. If turbidity persists after stirring, the samples were sonicated for 5 minutes at a temperature higher the lipid melting point. A thermodynamically static and translucency system was formed when all ingredients were mixed in suitable ratios for the formation of micro emulsion. The obtained micro emulsion was then disseminated in cold aqueous medium (5-10^{O}C) under mild mechanical stirring. The ratio of micro emulsion to aqueous medium was 1:20.

Table.1. Formulation Table

Ingredients	SL1	SL2	SL3	SL4	SL5	SL6
Lovastatin	0.2	0.2	0.2	0.2	0.2	0.2
Stearic acid	1	2	-	-	-	-
Cholesterol	-	-	1	2	-	-
Glyceryl mono stearate	-	-	-	-	1	2
Tween 80	1.5	1.5	1.5	1.5	1.5	1.5
PEG 400	1.5	1.5	1.5	1.5	1.5	1.5
Deionised Water	Q.S	Q.S	Q.S	Q.S	Q.S	Q.S

Evaluation of Nanoparticles

Morphology of Nanoparticles: Morphology of nanoparticles was characterized by scanning electron microscope (SEM) (Essa, 2010). SEM is one of the most limited instruments widely applied to surface microstructure imaging. SEM is a character of electron microscopy that images the sample surface of a solid specimen by using a focused beam of high-energy electrons. Nanoparticles containing Lovastatin was placed on a cover glass and shifted to a specimen stub. Dried samples were taken and coated with a platinum alloy to a thickness of 100° A. After completing the coating, shape and size was examined by scanning.

Particle size distribution: The nanoparticles size was analyzed by employing a Zetasizer, Ver. 6.20 (Malvern Instrument Ltd). The formulation was targeted in the sample holder and the particle size was measured (Elbary, 2008).

Poly dispersibility index (PDI): Poly dispersibility index (PDI): Polydispersity index (Nidhin, 2008) is defined as the particle size distribution of nanoparticles obtained from photon correlation spectroscopic analysis. The PDI was calculated for dispersion homogeneity ranging from 0 to 1. The value close to 0 indicated a homogeneous dispersion and greater than 0.3, high heterogeneity.

***In vitro* release studies:** Franz diffusion cell was used to determine the *in vitro* release of nanoparticles, having the receptor volume of 20ml in the cell. The diffusion area was $5cm^2$. The cell placed between the cell stirrer and water bath where the

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temperature was maintained at 32± 0.5°C. Cellophane membrane having a molecular weight (break up: 6000-8000) soaked previously in the receptor medium which was clamped between the donor and receptor chamber of diffusion cell. Formulated SLNs (100mg) were added to the donor compartment of the Franz diffusion cell which was blocked with a paraffin film. The receptor medium (pH 6.8 buffer + 1% tween 20) was stirred by magnetic bar. From the receptor compartment, 1ml sample was withdrawn at the following time intervals: 1, 2, 4, 6, 8, 10, 12 and 24 h and replaced by 1ml volume of the fresh receptor fluid. The withdrawn samples were centrifuged at 20,000rpm, for 30 minutes, at room temperature. By using the HPLC technique, the drug content in the supernatant liquid was estimated.

kinetics studies: In vitro Release data of various kinetic models were analyzed to describe the kinetics release. The zero order rate Equation. (1) describes the systems where the release rate of drug is independent of its concentration (Hadjiioannou, 1993). The first order Equation. (2) describes the release from the system where the release rate of drug is concentration dependent (Bourne, 2002). Higuchi (Higuchi, 1965) described the release rate of drugs from insoluble matrix as a square root of time dependent process based on Fickian diffusion Equation.(3). Where, k0 is zero-order rate constant expressed in units of concentration/time and t is the time.

$$Q = K0t \quad (1)$$

$$\text{Log } C = \text{Log}C0 - Kt / 2.303 \quad (2)$$

Where, C0 is the initial concentration of drug and k is first order constant.

$$Q = Kt\,1/2 \quad (3)$$

Where, K is the constant reflecting the design variables of the system.

The following plots were made:

a) Zero order kinetic model - Cumulative % drug release vs. time

b) First order kinetic model - Log cumulative of % drug remaining vs. time

c) Higuchi model - Cumulative % drug release vs. square root of time

d) Korsmeyer model - Log cumulative % drug release vs. log time

Preparation of nanoparticulated transdermal patches: Transdermal patches were prepared by dissolving varying concentrations of HPMC K100M (polymer) and PEG (plasticizer) in 50ml of distilled water. The mixture was soaked overnight to get rid of air bubbles. 100mg of Nanoparticles were incorporated into the polymeric solution. The prepared solution was poured into glass petri dishes of 25 cm2 area and dried at room temperature (Kulkarni, 2002; Munden, 1967). After 12 h, the patches were cut in 5 cm2 area and packed in aluminum foil until used.

Table.2. Formulation of Transdermal Patch

Formulation Code	Quantity of Nanoparticles (mg)	Amount of HPMC K100M (mg)	PEG 400 (10%w/w of polymer) (mg)
SLNP1	100	500	50
SLNP2	100	1000	100
SLNP3	100	1500	150

Evaluation Parameters for Transdermal Patches

Weight variation: Weight variation the surface area of the polymer film with 5cm2 was cut at 3 assorted places in the prepared film. Each film strip weight was considered and average weight was calculated.

Thickness of transdermal patches: Digital vernier calipers was used to evaluate the thickness of nanoparticulated transdermal patches. The values were taken by triplicate.

Drug content in transdermal patch: The patches (n=3) of 5 cm2 were weighted and dissolved in 100ml dichloro methane. The solution was filtered through 0.45 µm membrane filter and analyze the samples by HPLC method.

Folding endurance: The folding endurance was measured manually for the prepared patches. It is expressed as the number of times the patch is folded at the same place either to break the patch or to develop visible cracks. This is crucial to verify the power of the patch to resisit folding. This also gives an indication of brittleness (Raghuraman, 2002). This was ascertained by folding the patch repeatedly at the same place until the film breaks. The value of folding endurance is calculated by the number of times the patch could be folded at the same place without breaking/cracking (Devi, 2003).

Flatness: One strip is cut from the centre and two from each side of patches. The length of each strip is measured and variation in length is measured by determining percent constriction. Zero percent constriction is equivalent to 100 percent flatness (Arora, 2002)

$$\text{Constriction } (\%) = S1 - S2\ /S1 \times 100$$

Where, S1- initial length of strip, S2 - final length of strip

Tensile strength: Tensile strength was checked by weight pulley method (Gannu, 2008). The weight required for breaking the

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patch was taken as a measure of tensile strength of the patch.

Moisture content: Individually weigh the formulated films and placed in a desiccator which containing the calcium chloride at room temperature for a period of 24hrs. After assigned time interval the films were weighed again and again until they exhibit a constant weight. The percent moisture content was calculated using following formula (Bagyalakshmi, 2007).

% Moisture content= Initial weight-Final weight/Final weight*100

Moisture uptake: Weighed formulated films were taken and revealed to 84% relative humidity using saturated solution of potassium chloride in desiccator until a constant weight is achieved. % moisture uptake was calculated as given below.

% Moisture uptake = Final weight-Initial weight/Initial weight*100

drug release studies: Formulated Lovastatin nanoparticulated patch in vitro drug release was executed by using a modified USP type II dissolution apparatus using 900 ml dissolution medium (pH 6.8 buffer + 1% tween20). For the study of *in vitro* release of nanoparticulated patch, a circular patch of an internal diameter 5^2 cm was used. To sink the patch at the bottom of dissolution apparatus, a stainless steel ring was utilized. All the *in vitro* dissolution studies were conducted at 37±0.5 °C (temperature of the skin) at 100 rpm. At particular time intervals the samples were removed and substituted with an equal volume of fresh dissolution media to maintain sink conditions and their concentrations were examined using HPLC spectroscopy (Jain, 2001).

To analyse the release kinetics, data obtained from in vitro drug release rate studies were accommodated in respective kinetic models: cumulative percent of drug released vs. time (zero order), log cumulative percentage of drug remaining vs. time (first order) and cumulative percent drug released vs. square root of time (Higuchi's model). To determine the drug release mechanism, the release data were confirmed into Korsmeyer and Peppas equation as log cumulative percentage of drug released vs. log time, and the exponent n was computed from the slope of the straight line. If the exponent is 0.5 for slab matrix, then diffusion mechanism is Fickian; if 0.5< n <1.0, mechanism is non- fickian; if n is 1.0, the mechanism is zero order and if n >1.0, then it is super case II transport (Alam, 2009).

3. RESULTS AND DICUSSION

Compatability studies: The characteristic peaks for Lovastatin, viz. –OH stretching at 3550, -Ar-H stretching at 3011, aliphatic C-H stretching at 2956 & 2872, C=O stretching at 1698, and C=C aromatic stretching at 1466 cm-1 was also noticed in spectrum of drug with excipients (Fig 1 & 2). There is no appearance or disappearance of any characteristic peaks.

This establishes that the drug and excipients used in the nanoparticle preparation has no interaction.

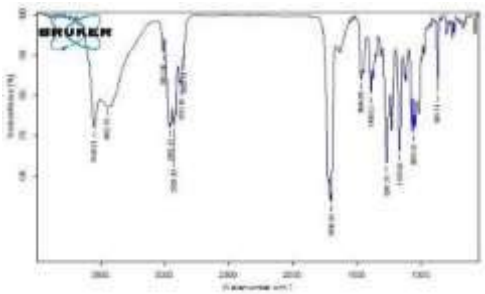

Fig.1. FTIR Spectrum of Lovastatin

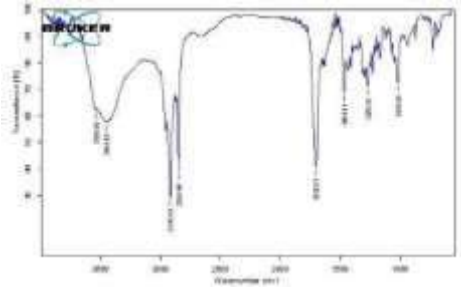

Fig2. FTIR Spectrum of Lovastatin+Excipients

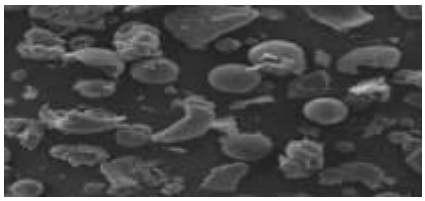

Fig.3. SEM image of Lovastatin solid lipid nanoparticle

Particle size and poly dispersity index: Lovastatin loaded SLNs developed by using cholesterol and stearic acid as the lipid matrix, resulted in bigger particle size compare to SLNs made by employing glyceryl monostearate.

This phenomenon could be assigned to the melting point of the lipid. Glyceryl monostearate, having melting point lower than remaining two lipids shown faster lipid crystallisation from the hot homonogenized condition resulting in decrease in the size of the particle. Various SLNs formulated with different lipids, the particle size of was in the order of Cholesterol > Stearic acid > glyceryl monostearate. A Drug lipid proportion is a critical parameter as the entrapment efficiency increased with increase in lipid phase. However an upper level is crucial to maintain the nanoparticle size in a reasonable range. The PDI of all formulations was found to be in the range of 0.186-0.376. In this study, Tween 80 and PEG 400 were opted as surfactant and

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cosurfactants which were reported earlier in the literature shall yield finer sized SLN.

Table.3. Physical evaluation of Lovastatin Solid Lipid Nanoparticles

Formulation Code	Particle Size (nm)	PDI	Entrapment efficiency (%)
SL1	181	0.312	75.6±3.2
SL2	192	0.279	81.6±1.9
SL3	249	0.376	74.3±0.8
SL4	243	0.301	77.4±2.4
SL5	132	0.186	91.6±1.6
SL6	139	0.193	93.5±1.8

Entrapment efficiency: The entrapment efficiency is the functional characteristic of polymers, drug and surfactant etc. The entrapment efficiency increases with the increase in the concentration of lipids. This may be due to decrease of surface tension between organic phase and aqueous phase that possibly allows the formation of initially smaller solvent droplets at the site and causes decreased particle size and increase entrapment efficiency. Entrapment efficiency was performed in all six batches (SL1 –SL6). The result obtained for different batches varies from 74.3±0.6 to 93.5±1.8 and are indicated in Table 3. It has been noticed that with enhancing the lipid concentration entrapment efficiency also increases. The maximum entrapment efficiency was found 93.5±1.8 prevailed in batch SL6.

Release studies: From SLNs the Lovastatin in vitro release exhibited a slow initial release at 2 h and followed by a sustained release at a perpetual rate. The initial release, was because of the loosely bounded surface present on the drug could be removed in the initial sink condition. The observed quantity might change with the accumulation and the disaggregation status of the particles. Figure 4 shows the Lovastatin in vitro release profile from nanoparticulate system. The prolonged release of the drug can be assigned to the drug embedment in the solid lipid matrix.

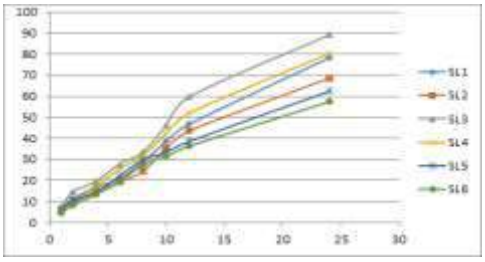

Figure.4. Release profiles of Lovastatin SLNsloaded transdermal patches

Table.4. *In-vitro* drug relese kinetics from solid lipid nanoparticles formulaions

rmulation code	Zero order		First order		Higuchi		Korsmeyer-Peppas		Drug release mechanism
	r^2	Slope	r^2	Slope	r^2	Slope	r^2	Diffusion exponent (n)	
SL1	0.9897	3.1637	0.9667	0.027	0.9586	18.529	0.9858	0.783	Non-Fickian
SL2	0.9801	2.8049	0.9866	0.0212	0.9599	16.518	0.9854	0.796	Non-Fickian
SL3	0.987	3.6417	0.9649	0.0408	0.9639	21.445	0.984	0.786	Non-Fickian
SL4	0.9771	3.3227	0.9876	0.03	0.9788	19.79	0.9959	0.865	Non-Fickian
SL5	0.9795	2.447	0.998	0.0173	0.9852	14.603	0.9921	0.734	Non-Fickian
SL6	0.9721	2.3117	0.9975	0.0154	0.9889	13.875	0.9955	0.807	Non-Fickian

The kinetics release from nanoparticles was shown in Table 4. All the preparations fit First order model, R^2 values calculated are in the array of 0.9649 to 0.998. Value of exponent n from Koresmeyer model was in the array of 0.734 to 0.865. This is an indication that the dominant drug transport mechanism appears to be non-Fickian diffusion (n 0.45 < n=0.89).

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Evaluation of transdermal patches: Results of various parameters studied of transdermal nanoparticulated patches were mentioned in Table 5 and were observed to be in desired range. Folding endurance test results confirmed that the patches would be stable with general skin folding and would not break when applied. Flatness studies results shows that no preparartion had the differnce in the strip length earlier and later their cuts, showing 100% flatness in all the formulations. No constriction was observed: this indicates that all the transdermal patches have smooth, flat surface and when the patch was applied to the skin smooth surface can be maintained.

Table.5. Evaluation of various parameters of Transdermal Patch

Parameters	SLNP1	SLNP2	SLNP3
Weight variation (g)	0.372±0.015	0.385±0.022	0.392±0.02
Thickness (mm)	0.199±0.012	0.208±0.009	0.224±0.14
Drug content (%)	92.41±2.523	93.22±1.48	89.72±0.892
Folding endurance	96.21±3.231	102±2.458	109.12±1.589
Flatness	100	100	100
Tensile strength (Kg/mm^2)	3.87±0.022	4.82±0.01	5.04±0.121
Moisture content (%)	2.354±0.432	2.920±0.125	3.213±0.251
Moisture uptake (%)	2.7±0.24	2.9±0.32	3.4±0.072

The tensile strength of the SLNP1 to SLNP3 shows the 3.87 ± 0.022 to 5.04 ± 0.112 shows the excellent viscosity. Moisture content consequences shown that increasing the concentration of hydrophilic polymers the moisture content was observed to enhanced in all the formulations. In the developed patches the moisture content was low, which could assist the prepared formulations stable and brittleness reduces throughout long- term storage (Ubaidulla, 2007). The low absorption of moisture assists the material from microbial contamination and patch bulkiness. Moisture uptake of the prepared formulations (2.7±0.24 to 3.4±0.72) was low, facilitating the prepared formulations to persist stable for usage and longtime storage. The in vitro release profiles of different transdermal patches were mentioned in Fig 5. The cumulative percentage drug release for SLNP1, SLNP2and SLNP3 was observed to be 52.1±0.6, 46.5±1.4 and 41.2±1.8 respectively at 48 h. It was found that as the concentration of polymer increases the drug release was observed to be decreased. SLNP2 which has shown better release can be considered as best formulation. Burst releases as well as sustained release, both are of interest to dermal application. To facilitate the penetration of the drug, burst release can be helpful. Sustained release supplied the drug over a prolonged period of time.

Fig .5. Release profiles of Lovastatin SLN loaded Transdermal Patches

Table.6. *In vitro* kinetic studies of SLN Tansdermal patches

Formulation code	Zero order		First order		Higuchi		Korsmeyer-Peppas		Drug release mechanism
	r^2	Slope	r^2	Slope	r^2	Slope	r^2	Diffusion exponent (n)	
SLNP1	0.9947	0.9464	0.9863	0.006	0.9685	7.8995	0.9736	0.6122	Non-Fickian
SLNP2	0.9954	0.8348	0.9855	0.005	0.9649	6.9525	0.9783	0.6065	Non-Fickian
SLNP3	0.9858	0.7176	0.9641	0.004	0.9353	5.913	0.9579	0.5700	Non-Fickian

The description of dissolution profile of a model function has been attempted using different kinetics (zero order, first order, Higuchi square root model, Korsmeyer's Peppas model (Table 6). All the formulations (SLNP1- SLNP3) followed first order release kinetics. The correlation coefficients (R2) were observed to be in the range of 0.9641-0.9863. The data were implemented to Higuchi and the line obtained were comparatively linear (r2 = 0.9353- 0.9685) suggesting that the diffusion might be of drug release. To affirm further drug release mechanism, the data were confirmed to Korsmeyer's Peppas equation. The release exponent 'n' value ($0.5 < n < 1$) of korsmeyer's peppas model indicated that release of the drug from all the patches followed anomalous transport.

4. CONCLUSION

It can be concluded that Lovastatin, poorly water soluble drug converted to SLNs, which are then included in transdermal patch to overcome the problems with oral administration. The Lovastatin SLNs were formulated by micro emulsion

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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process using stearic acid, cholesterol and glyceryl mono stearate as lipids. The physical parameters, entrapment and release studies indicated the formulation SL6 prepared using glyceryl mono sterate was suitable to prepare transdermal patch. The transdermal patches containing SLNs employing HPMC in changing concentrations were referred to various parameters and found that formulation SLNP2 shown the sustained release over a time period of 48 h, which can gain the patient in reducing the dosing frequency. So it is concluded that transdermal patch containing Lovastatin SLNs can represent as a potential drug delivery approach for treating hyperlipidemia. Further, it can be employed for pharmacokinetic and pharmacodynamic studies in suitable animal models.

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EPRA International Journal of Research and Development (IJRD)
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EFFECT OF WALKING TECHNIQUE ON HEALTH RELATED FITNESS FUNCTIONAL OF WOMEN

Ms.N.Sathiyabama[1], Dr.R.Annadurai[2]
[1]Ph.D. Research Scholar Department of Physical Education, Bharathiar University, Coimbatore, India.
[2]Professor, Department of Physical Education, Bharathiar University, Coimbatore, India

ABSTRACT
The study was designed to investigate the Effect of Walking technique on health related fitness functional of women. To investigate the study, thirty women were randomly selected from spouse women's at Coimbatore district and their age ranged between 30 and 35 years. The subjects were randomly assigned to two equal groups (n=15). All the subjects were divided in to two groups with 15 subjects in each as experimental and control group. Group-I underwent walking technique for a period of 12 weeks and group-II acted as control who did not participate in any special training other than the regular routine. The health related fitness variables such as Muscular strength and Flexibility were selected as dependent variables. Pre and post-test random group design was used for this study. The dependent't' test was applied to determine the difference between the means of two groups. To find out whether there was any significant difference between the experimental and control groups. To test the level of significant of difference between the means 0.05level of confidence was fixed. The result of the study shows that, there was a significant improvement takes place on Muscular strength and Flexibility of of women due to the Effect of Waling technique. And also concluded that, there was a significant difference exists between experimental and control groups in Muscular strength and Flexibility. The control group did not improve the selected criterion variables.
KEYWORDS: *Waling Technique Muscular Strength and Flexibility,*

INTRODUCTION

Walking is one of the most popular forms of exercise worldwide. It doesn't require expensive equipment or special skills, and it provides a wide range of health benefits. Whether you choose an outdoor solitary path in nature, a busy route on city sidewalks, a treadmill workout, or a few rounds around your office building, walking is a relatively accessible way to stay active. Walking is a type of cardiovascular physical activity, which increases your heart rate. This improves blood flow and can lower blood pressure. It helps to boost energy levels by releasing certain hormones like endorphins and delivering oxygen throughout the body. Brisk walking is considered a moderate-intensity, low-impact workout that does not exert excess strain on joints (hip, knee, ankles) that are susceptible to injury with higher-impact workouts walking prevents cancer, walking prevents obesity, walking prevents diabetes, walking helps improve back pain, walking improves circulation **Arivazhakan (2018),**

METHODOLOGY

The purpose of the study was to find out the Effect of Waling technique. To achieve the purpose of the study, thirty women were house women at Coimbatore. The subjects were randomly assigned in to two equal groups namely, Waling technique group (BTG) (n=15) and Control group (CG) (n=15). A pilot study was conducted to assess the initial capacity of the subjects in order to fix the load. The respective training was given to the experimental group the 3 days per weeks for the training period of six weeks. The control group was not given any sort of training except their routine.

DESIGN

To evaluate Health related fitness variable Muscular strength was sit-ups test score in counts and Flexibility was by sit and reach test score in centimeters. The parameters were measured at baseline and after 12 weeks of Waling technique were examined.

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STATISTICAL ANALYSIS

The collected data before and after training period of 12 weeks on the above said variables due to the Effect of Waling technique was statistically analysed with 't' test to find out the significant improvement between pre and post-test. In all cases the criterion for statistical significance was set at 0.05 level of confidence. (P<0.05)

Table I

Computation of 'T' Ratio on experimental group and Control group selected House women Coimbatore.

Group	Variables		Mean	N	Std. Deviation	Std. Error Mean	t ratio
Experimental Group	Muscular strength	Pre	9.46	15	2.13	0.13	14.49*
		Post	11.46	15	2.13		
	Flexibility	Pre	15.6	15	4.06	1.02	6.13*
		Post	16.07	15	3.81		
Control Group	Muscular strength	Pre	9.80	15	2.21	0.30	0.88
		Post	9.53	15	1.95		
	Flexibility	Pre	15.2	15	4.88	1.2	1.97
		Post	14.93	15	4.45		

*Significant level 0.05 level degree of freedom (2.14, 1 and 14)

Table I reveals the computation of mean, standard deviation and't' ratio on selected Health related fitness variable namely Muscular strength and Flexibility of experimental group. The obtained 't' ratio on Muscular strength and Flexibility were 14.49 and 6.13 respectively. The required table value was 2.14 for the degrees of freedom 1and 14 at the 0.05 level of significance. Since the obtained't' values were greater than the table value it was found to be statistically significant. Further the computation of mean, standard deviation and't' ratio on selected Health related fitness variable namely Muscular strength and Flexibility of control group. The obtained't 'ratio on Muscular strength and Flexibility were 0.88 and 1.97 respectively. The required table value was 2.14 for the degrees of freedom 1and 14 at the 0.05 level of significance. Since the obtained't' values were lesser than the table value it was found to be statistically not significant.

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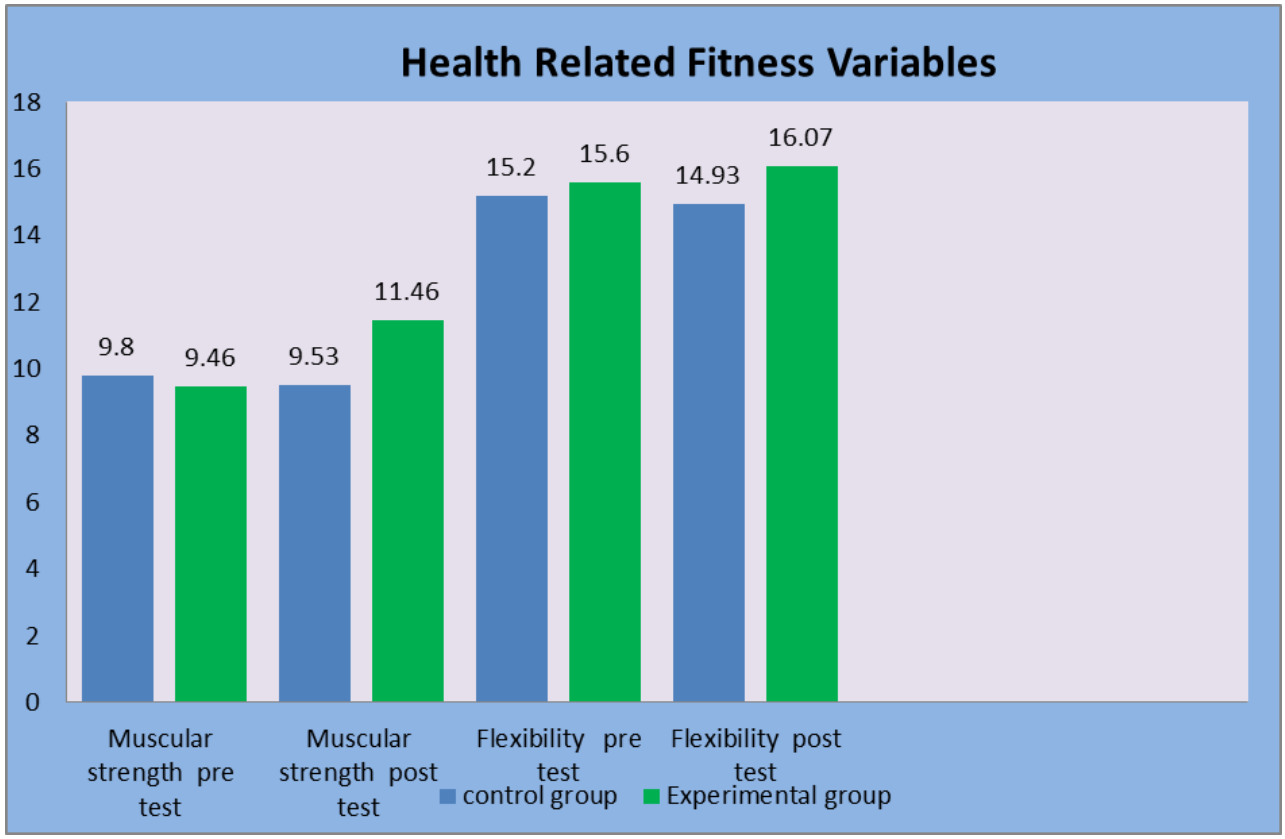

DISCUSSION AND FINDINGS

The result of the present showed the Effect of Waling technique on health related fitness of women. And there was a difference between experimental group and control group. The findings of the present study are in line with investigator referred in this study. Muscular strength and Flexibility developed due to the game specific training after 12 week training period **. C Durai and** (2019) Effect of brisk walking on selected physical fitness variables among college women**. Manson** (2019) A prospective study of walking as compared with vigorous exercise in the prevention of coronary heart disease in women. **(Murphy)** The effect of walking on fitness, fatness and resting blood pressure: a meta-analysis of randomised, controlled trials. Preventive medicine. **(Rippe 2013)** Walking for health and fitness. Jama. **(George)** A modified version of the Rockport Fitness Walking Test for college men and women. **Fellingham 2020** investigated Effect of Waling technique on health related fitness of women. From the result of the present study, it is speculated that the observed changes in Muscular strength and Flexibility may properly designed game specific which are suitable for male tennis players.

CONCLUSION

1. There was a significant improvement takes place on selected health related fitness variable due to the effect of 12 weeks Waling technique.
2. There was a significant difference exists between experimental and control groups on selected health related fitness variable such as Muscular strength and Flexibility.

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SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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EPRA International Journal of Research and Development (IJRD)
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VULNERABILITE DE LA PRODUCTION DU MANIOC AUX CHANGEMENTS CLIMATIQUES ET PRIORITE D'ADAPTATION DANS LES AGGLOMERATIONS FRONTALIERES BENIN-TOGO (VALLEE DU MONO, AFRIQUE DE L'OUEST)

Sebo Vifan Éric Laurent Sévimi Coffi
Ecole Nationale Supérieure des travaux Publics (ENSTP/UNSTIM)
Laboratoire de Géosciences de l'Environnement et Application (LaGEA)

Article DOI: https://doi.org/10.36713/epra12133
DOI No: 10.36713/epra12133

ABSTRACT

In the south of the Mono Valley and in its Benin-Togo border towns, the production of cassava roots is hampered by fluctuating climatic conditions. It is in this context that this study is conducted, in order to analyze climatic variations and their impact on cassava production. Thus, climatological data (rainfall, temperature, relative humidity, potential evapotranspiration) and agricultural data (sown areas, yield and production of cassava) made it possible to characterize the major agroclimatic situations. Documentary research and field surveys formed the basis of the research methodology. In addition, data analysis reveals that the study area has a bimodal rainfall regime. The annual evolution of rainfall over the period
1988-2018 is marked by 45.16% of surplus years, 12.90% of normal years and 41.93% of deficit years. Therefore, the index of the deviation from the minimum value was calculated in order to see the years where the minimum need was not satisfied for certain years. In addition, an upward trend in average temperatures is noted with an average annual rate of 0.04°C/year. The linear correlations established between cassava yields and climatic parameters showed that there is no explicit linear relationship between cassava production and temperature and between cassava production and insolation. The rainfall and humidity dependence of cassava production are also low: 27% and 20% respectively. Thus, climatic parameters taken in isolation are not sufficient to explain agricultural yields. In addition, other factors could also play an inhibiting or enhancing role in yields. However, the producers have developed adaptation strategies in the face of climatic variability in the study area that deserve to be accompanied.

KEYWORDS : *Climate change, Cassava, Lower Mono Valley, border agglomeration, Benin and Togo*

RESUME

Au sud de la vallée du Mono et dans ses agglomérations frontalières Bénin-Togo, la production des racines de manioc est entravée par la fluctuation des conditions climatiques. C'est dans ce contexte que cette étude est menée, afin d'analyser les variations climatiques et leurs incidences sur la production du manioc. Ainsi, les données climatologiques (pluviométrie, température, humidité relative, évapotranspiration potentielle) et celles agricoles (superficies emblavées, rendement et production de manioc) ont permis de caractériser les situations agroclimatiques majeures. La recherche documentaire et les enquêtes de terrain ont constitué la base de la méthodologie de recherche. En outre, l'analyse des données révèle que la zone d'étude a un régime pluviométrique bimodal. L'évolution annuelle de la pluviométrie sur la période 1988-2018 est marquée par 45,16 % d'année excédentaires, 12,90 % d'année normales et 41,93 % d'année déficitaires. De ce fait, l'indice de l'écart à la valeur minimale a été calculé afin de voir les années où le besoin minimum n'a pas été satisfait pour certaines années. De plus, il est remarqué une tendance à la hausse des températures moyennes avec un taux moyen annuel de 0,04°C/an. Les corrélations linéaires établies entre les rendements du manioc et les paramètres climatiques ont montré qu'il n'existe pas de relation linéaire explicite entre la production du manioc et la température et entre la production du manioc et l'insolation. La dépendance pluviométrique et celle hygrométrique de la production du manioc sont également faibles : respectivement 27 % et 20 %. Ainsi, les paramètres climatiques pris isolément ne suffisent pas à expliquer les rendements agricoles. Par ailleurs, d'autres facteurs pourraient également jouer un rôle inhibiteur ou bonificateur des rendements. Cependant, les producteurs ont développé des stratégies d'adaptions face aux variabilités climatiques dans la zone d'étude qui méritent d'être accompagnées.

MOTS-CLES : *Changement climatique, Manioc, Basse Vallée du Mono, agglomération frontalière, Bénin et Togo.*

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INTRODUCTION

Les changements climatiques sont devenus aujourd'hui une préoccupation mondiale, en particulier pour les agriculteurs africains qui luttent pour faire face à la hausse des températures, à la concentration des précipitations sur un laps de temps pendant la saison pluvieuse, à l'augmentation de la fréquence des sécheresses et des risques d'inondation (GIEC, 2014). En effet, les dernières décennies de la fin du deuxième millénaire ont été marquées par une évolution rapide des climats (Edjame, *et al.*, 1992 ; Kekey, *et al.*, 1993 ; Nicholson, 1998 ; Adjoussi, 2000). Les recherches effectuées par Olivry (1983) et Sircoulon (1990) indiquent que les précipitations en Afrique ont été marquées par une diminution. Dans ce contexte continental, la région ouest-africaine a connu une récession pluviométrique aux ampleurs parfois très accusées, doublée d'une augmentation significative due au nombre d'années sèches (Sircoulon, 1990 ; Amran, 1996). Au Bénin comme au Togo, de nombreuses recherches (Kekeh et Edjame, 1987 ; Piton, 1989 ; Issa, 1995 ; Awesso et Sivakumar, 1996 ; Klassou, 1996 ; Bokonon-Ganta, 1999 ; Houndénou, 1999 ; Ogouwalé, 2006 ; Afouda, *et al.*, 2007 ; Amoussou, *et al.*, 2009 ; Amoussou, *et al.*, 2014) révèlent une nouvelle dynamique climatique qui se traduit par de grands déficits pluviométriques souvent alternés avec des années de fortes précipitations, puis une augmentation sensible des températures, depuis les années 1960. Les conséquences de cette situation climatique pour l'agriculture pluviale pratiquée dans ces deux pays sont entre autres, la perturbation des cycles culturaux, le bouleversement du calendrier agricole traditionnel en vigueur chez les paysans, la baisse des rendements agricoles et les pertes de récoltes (Vignigbé, 1992 ; Badameli, 1996 ; Houndénou, 1999 ; Agbéko, 2003 ; DSID, 2005 ; Ogouwalé, 2006). Ainsi, les agricultures béninoises et togolaises subissent donc déjà le contre coup des changements observés au niveau des paramètres climatiques, notamment la baisse des précipitations et la hausse des températures.

En outre, dans ces deux pays, le manioc occupe une place de choix dans le système agricole et vient au deuxième rang après le maïs (Marquette, 1985 ; Salanon, 2008). De par sa production et eu égard à son poids dans l'alimentation des populations béninoises et togolaises, le manioc représente aujourd'hui pour ces populations, surtout des milieux ruraux, une principale culture vivrière et l'aliment de base le plus important après le maïs (Kpogo, 1999 ; Bassili, 2006). Cette plante est d'ailleurs l'une des principales cultures produites dans les agglomérations frontalières Bénin-Togo situées à la lisière du fleuve Mono. Elle est en même temps la matière de base la plus transformé (Marquette, 1985 ; DSID, 2005 ; Bassili, 2006 ; Salanon, 2008).

Mais sa production se retrouve être confronté à la variabilité climatique, l'un des sujets les importants de ces dernières années. Pour Badameli, 1996 ; Agbéko, 2003 ; DSID, 2005 ; Ogouwalé, 2006 et Totin, et al., 2016, les communautés paysanes seront les plus vulnérables du fait de leurs capacités d'adaptation limitées et de leur grande dépendance de ressource à forte sensibilité climatique telles que l'eau et les systèmes de production. Cette situation contraint les producteurs à développer des stratégies d'adaptation afin de préserver leurs moyens de subsistance.

La présente étude se propose donc d'évaluer l'ampleur des irrégularités climatiques et leurs impacts sur la production du manioc dans les agglomérations frontalières Bénin-Togo situées à la lisière du fleuve Mono. L'étude est fondée sur trois hypothèses : les agglomérations frontalières Bénin-Togo sont soumises à une forte variabilité climatique ; la variabilité climatique influence la production du manioc dans la zone d'étude ; plusieurs stratégies sont développées par les producteurs de manioc pour faire face aux impacts néfastes de la variabilité climatique dans les agglomérations frontalières Benin-Togo.

1. MATERIEL ET METHODES

1.1. Situation géographique de la zone d'étude

Le bassin versant du Mono est à cheval sur le Togo et le Bénin, bien que sa majeure partie (les fractions hautes et moyennes) se situe sur le territoire togolais. Mais, le bassin versant du Mono ne fait pas, dans sa totalité, objet de la présente étude. Seule sa fraction basse, largement partagée par le Bénin et le Togo, est concernée la présente étude (figure 1). Celle-ci se localise entre les parallèles 6°14‟ et 7°18‟ de latitude Nord et les méridiens 1°12‟ et 1°54‟ de longitude Est. Elle couvre six Communes du côté béninois (Aplahoué, Athiémé, Djakotomey, Dogbo, Grand-Popo et Lokossa) et quatre Régions du côté togolais (Région d'Ogou, Région de Haho, Région de Yoto et Région des Lacs).

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
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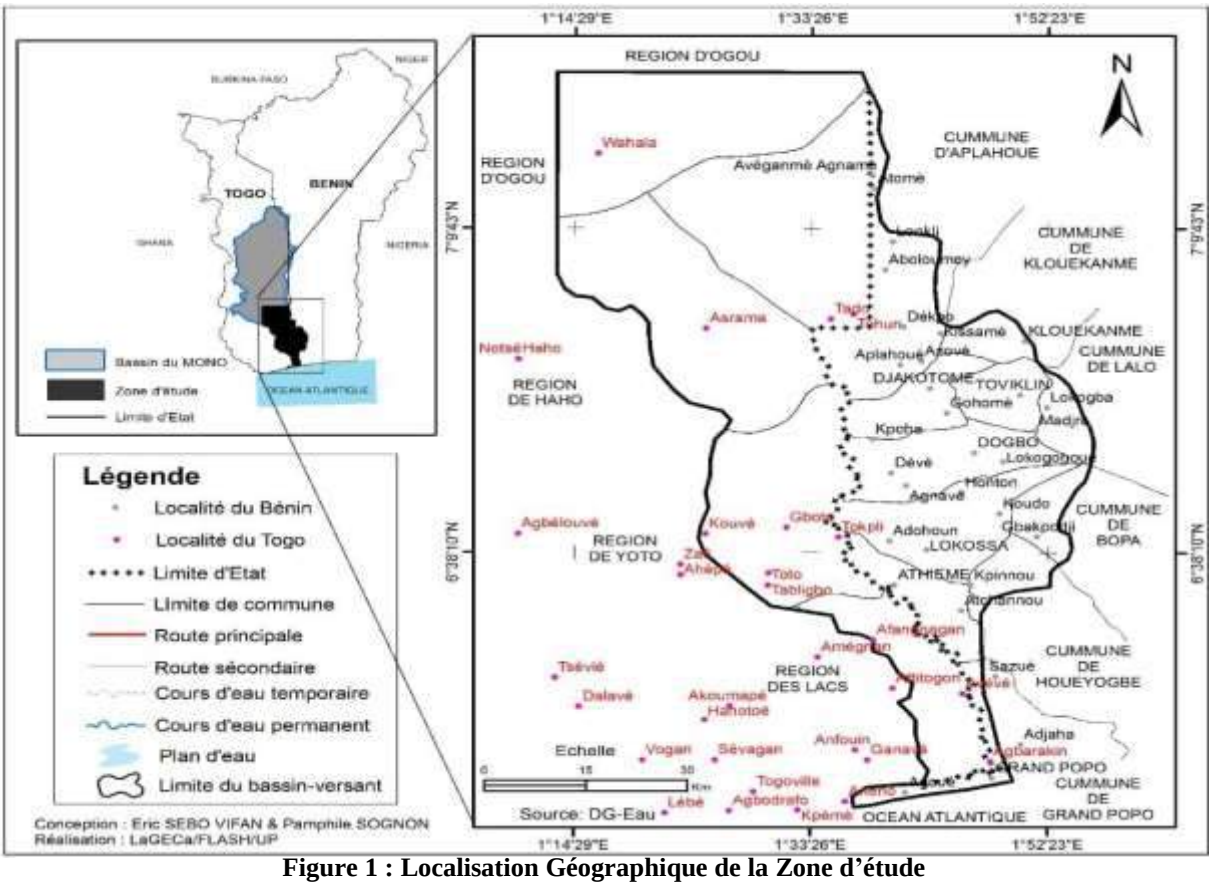

Figure 1 : Localisation Géographique de la Zone d'étude

1.2. Données et méthodes

1.2.1. Données collectées

Les données climatologiques utilisées dans la présente étude sont les séries climatologiques mensuelles de précipitation du poste pluviométrique d'Athiémé, de température, d'humidité relative et d'évapotranspiration potentielle (ETP) de la station synoptique de Tabligbo. Ces séries couvrent la période de 1988 à 2018.

Les données de production brute de manioc et de superficies totales emblavées sont issues des annuaires statistiques de la Direction de la Statistique Agricole (Bénin) et de la Direction des Statistiques agricoles, de l'Informatique et de la Documentation (Togo). Celles-ci couvrent essentiellement la période de 1998 à 2018. Les rendements agricoles (quantité produite à l'hectare) dérivent donc de la production totale rapportée à la superficie totale emblavée. Ces données ont permis de faire l'analyse corrélative du climat et de la production du manioc.

Les données démographiques concernent les effectifs des populations-cibles (agriculteurs) présentent dans la basse vallée du Mono. Pour le Bénin, ces effectifs ont été estimés en croisant les données de l'Institut National de la Statistique et de l'Analyse Economique (INSAE) à celles du Ministère de l'Agriculture, de l'Elevage et de la Pêche (MAEP). Pour le Togo, ces effectifs ont été estimés en croisant les données de l'Institut National de la Statistique et des Etudes Economique et Démographiques (INSEED) à celles du Ministère de l'Agriculture, de la Production Animale et Halieutique (MAPAH) et du quatrième Recensement National de l'Agriculture (RNA). Ceci a permis d'évaluer, pour l'année 2018, la population agricole de la zone d'étude à 212 988 individus composé de 111 708 agriculteurs béninois et de 101 280 togolais. L'exploitation des données démographiques a permis de réalisation des investigations auprès de 766 agriculteurs (383 agriculteurs béninois et 383 agriculteurs togolais). Cet échantillon a été déterminé avec le protocole statistique de SCHWARTZ (1995) appliquée à l'effectif totale de la population agricole de la zone d'étude. Ce protocole statistique se présente sous la forme $N = Z\alpha^2 PQ/d^2$ avec N = taille de l'échantillon ; $Z\alpha$ = écart fixé à 1,96 correspondant à un degré de confiance de 95 % ; P = nombre n_{pays} des agriculteurs de chaque pays de la basse vallée du Mono par le nombre total n_{bassin} des agriculteurs de la basse vallée du Mono; Q = 1-P et d = marge d'erreur (d = 5 %).

Les données collectées auprès des agriculteurs sont relatives aux différentes stratégies d'adaptation qu'ils ont développées pour faire face aux effets / impacts du changement climatique dans la zone d'étude.

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1.2.2. Méthodes de traitement des données

- ***Moyenne Arithmétique***

La moyenne a été le paramètre utilisé pour caractériser l'état climatique moyen de la zone d'étude. En effet, la moyenne des hauteurs de pluies, de température et de l'humidité relative a été calculée par la formule : M = $\mathbf{M} = \frac{\mathbf{1}}{\mathbf{n}}\sum_{\mathbf{i=1}}^{\mathbf{n}}\mathbf{(x)i}$, x = la moyenne arithmétique ; n = l'effectif total des modalités ; xi = modalité du caractère étudié.

- ***Indice pluviométrique***

Les indices pluviométriques qui sont déterminés en utilisant la formule $Ip = \frac{xi-\bar{x}}{\sigma(x)}$ (où xi représente la valeur annuelle des précipitations pour l'année i, et $\bar{x}$ et σ(x), représentent respectivement, la moyenne et l'écart type de la série considérée. Dans ce travail, les indices négatifs ont été déterminées par rapport à l'indice pluviométrique de Lamb (Lawin, et al., 2011). Selon cet indice, une année est considérée comme stable si son indice est compris entre - 0,1 et + 0,1. Elle est dite humide si son indice est supérieur à 0,1 et sèche en deçà de - 0,1. Ils ont facilité l'analyse des anomalies pluviométriques.

- ***Tendance d'évolution***

Les tendances d'évolution ont été mises en évidence par le modèle linéaire qui a l'avantage de proposer une représentation synthétique dynamique de l'évolution des paramètres considérés (Wesselink, *et al.*, 1995). L'équation de la droite de régression linéaire est de la forme $Y = at + b$, dont a est le coefficient dont le signe positif (+) ou négatif (-) exprime respectivement une tendance à la hausse ou à la baisse dans le temps t, b une constante et *Y* la valeur de la variable dont la tendance est recherchée. Les tendances pluviométriques et thermométriques ont été celles recherchées dans la présente étude.

- ***Calcul des indices agroclimatiques***

- ***Indice de l'écart à la valeur minimale***

Cet indice a permis de faire la différence entre la hauteur de précipitation annuelle (Pi) et la hauteur minimale annuelle nécessaire (Pmini) qui est égale à 1000 mm encore appelé écart à la valeur minimale. **Emini = Pmini-1000 mm**

- ***Bilan climatique***

Le calcul du bilan climatique annuel a permis de confirmer les résultats obtenus au niveau de l'indice de l'écart à la valeur minimale. Le bilan climatique (Bc), différence entre la quantité de pluie (P) et l'évapotranspiration potentielle (ETP), donne une idée approximative sur la disponibilité en eau de la plante. En effet, pour déterminer les années sèches et humides, les pluies annuelles ont été comparées à l'évapotranspiration potentielle (ETP) annuelle par la formule **Bc = P - ETP** avec : Bc = bilan climatique (mm) ; P = pluviométrie totale (mm) ; ETP = évapotranspiration potentielle (mm).

Ainsi, si : P - ETP < 0, Bc est déficitaire. Par contre, si P - ETP > 0, Bc est excédentaire. Lorsque P - ETP = 0, Bc est équilibré.

- ***Analyse comparée de la production du manioc et de la variabilité climatique***

Une approche par régression linéaire simple a été faite afin de déterminer l'impact du climat sur les productions agricoles. Elle a essentiellement consisté à comparer les rendements agricoles observés aux durées des saisons culturales. En effet, un coefficient de corrélation -1 < (r) < 1 signifie que lorsque les variables explicatives (durées des saisons culturales) ont tendance à croître, les variables expliquées (rendements de manioc) augmentent elles aussi réciproquement.

2. RESULTATS ET DISCUSSION

2.1. Caractéristique climatique de la zone d'étude

2.1.1. Régime pluviométrique et évolution interannuelle de la pluviométrie dans la zone d'étude

La figure 2 présente le régime pluviométrique et l'évolution interannuelle de de la pluviométrie dans la zone d'étude.

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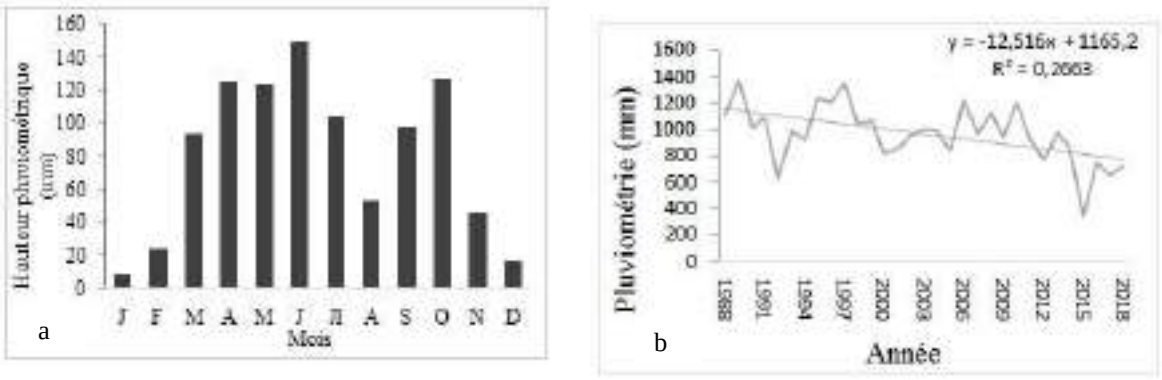

Figure 2 : Régime pluviométrique (a) et évolution interannuelle de la pluviométrie (b) de 1988 à 2018 dans la zone d'étude

L'analyse de la figure 2a montre que la zone d'étude a un régime bimodal avec les quantités de pluie les plus élevées en avril, mai, juin et octobre. Elles peuvent occasionner des inondations, en général pendant le mois d'août et de septembre au niveau des bassins versants, en créant ainsi des pertes de cultures. Le mois d'août représente la petite saison sèche. La pluviométrie dans la zone d'étude est marquée par des fluctuations interannuelles remarquables avec une succession de périodes sèches et de périodes humides. Ainsi l'analyse de la figure 2b révèle que l'évolution de la hauteur moyenne d'eau entre 1988 et 2018 présente une tendance régressive avec un taux de régression de 12,51% par an.

En effet, plusieurs études portant sur le bassin du Mono (Rossi et Blivi, 1995 ; Gnogbo, 1996 ; Blivi, 2000a ; Blivi, 2000b ; Amoussou, 2010) réalisées à l'échelle ouest-africaine ou du Bénin et du Togo, identifient un climat subéquatorial dans le bassin de la côte à la latitude 7°30' Nord, avec une nuance maritime (de la côte à la latitude 6°35' Nord) et une nuance intérieure (de 6°35' à 7°30' N).

2.1.2. Indice pluviométrique

La figure 3 montre l'évolution de l'indice pluviométrique dans la zone d'étude.

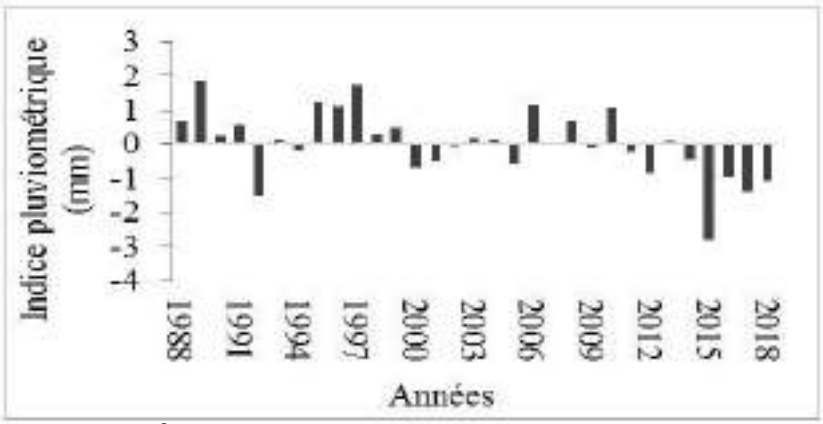

Figure 3 : Évolution de l'indice pluviométrique de 1988 à 2018 dans la zone d'étude

L'indice pluviométrique sur la période 1988-2018 a permis de constater que la zone d'étude est caractérisée par une alternance des d'années déficitaires, excédentaires et normales. Ainsi, la zone d'étude a enregistré 45,16 % d'année excédentaires, 12,90 % d'année normales et 41,93 % d'année déficitaires. L'alternance des années excédentaires, normales et déficitaires entraine le bouleversement du calendrier cultural dans la zone d'étude.

2.1.3. Régime thermométrique mensuel et variabilité interannuelle de la température

Le régime thermométrique moyen sur la période 1988-2018 de la zone d'étude est illustré dans la figure 4.

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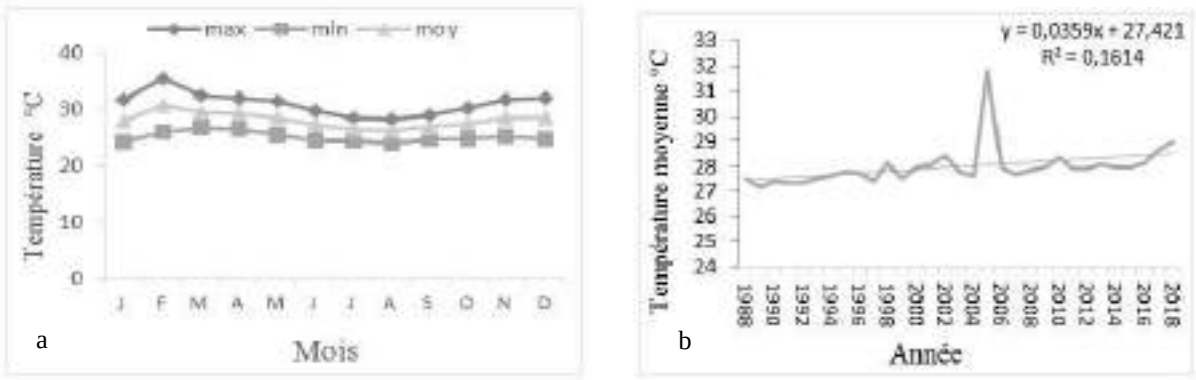

Figure 4 : Régime thermométrique (a) et évolution interannuelle de la température (b) de 1988 à 2018 dans la zone d'étude

Cette figure 4a révèle que la température moyenne croit de 27,71 °C en janvier à 29,50 °C en mars. Cette période qui est la plus chaude de l'année ne favorise pas la production agricole. Bon nombre de producteurs s'adonnent donc à d'autres activités telles que le commerce, l'artisanat et le transport. Par ailleurs, la température moyenne mensuelle dans la zone d'étude chute progressivement de 29,12 °C au début du mois d'avril à 26,05 °C en août puis croit progressivement de 26,77 °C en septembre à 28,30 °C en décembre.

La figure 4b met en évidence l'évolution interannuelle de la température moyenne. Il ressort de l'analyse de cette figure 4b que la température a connu une hausse au cours de la période d'étude. En effet, l'évolution de la température moyenne varie entre 27,19 °C en 1986 et 31,82

°C en 2005 soit une augmentation de 0,03 °C/an. Cela voudra dire que la température s'élève de plus en plus au fil des ans. Il est évident que la hausse des valeurs thermométriques pour la période 1988-2018, montre que le milieu d'étude n'est pas épargné par le réchauffement planétaire observé.

2.1.4. Régime hygrométrique

L'humidité relative de par sa capacité à mettre en équilibre la vapeur d'eau entre la surface de l'exploitation agricole et celle de l'air que l'entour, joue un rôle crucial dans la satisfaction en eau des cultures. Car, lorsque l'humidité relative est élevée, cela conduit à la baise l'ETP. La figure 5 présente le régime hygrométrique de 1988-2018 dans la zone d'étude.

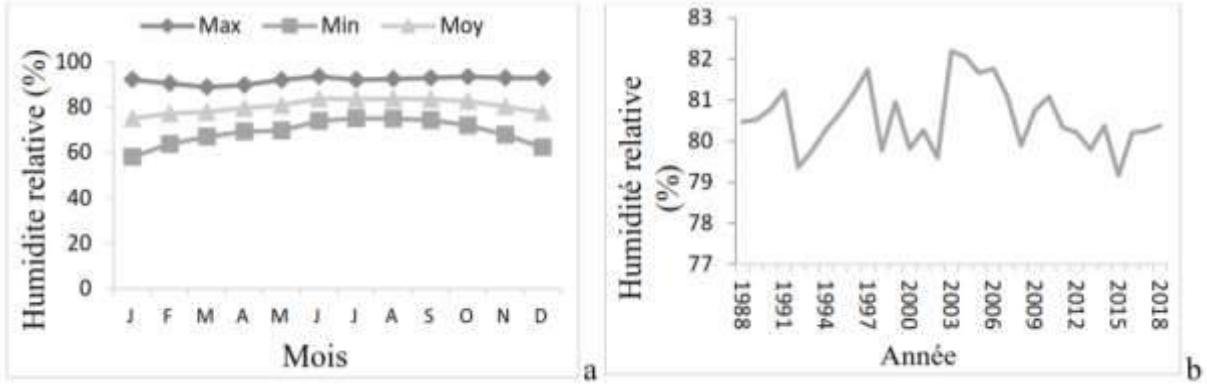

Figure 5 : Régime hygrométrique (a) et évolution interannuelle de l'humidité relative (b) de 1988 à 2018 dans la zone d'étude

La figure 5a présentant l'évolution de l'humidité relative dans la zone d'étude révèle que l'humidité relative moyenne oscille entre 75 % en janvier et 84 % en août. L'humidité relative maximale quant à elle, est très élevée en saison pluvieuse avec un optimum enregistré en juin (94 %). Elle oscille entre 58 % en janvier et 75 % en juin pour les minimums.

Des travaux de Cornet (2005), on retient qu'en deçà de 30 %, les plantes ferment leurs stomates pour limiter les pertes d'eau, ce qui arrête la transpiration.

L'analyse de la figure 5b permet de constater une variation de l'humidité relative moyenne annuelle entre 79 % et 81,74 %. A l'échelle annuelle, la variation de l'humidité relative n'influence pas la production de manioc. Cependant, il est intéressant de constater que cette fourchette correspond aux valeurs idéales de l'humidité relative pour une production agricole excellente (Badameli, 1996 ; Agbéko, 2003 ; Cornet, 2005 ; Ogouwalé, 2006). Mais dans un contexte d'augmentation de la température, ces valeurs risques de diminuer ce qui ne serait pas sans conséquence sur la production de manioc.

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2.1.5. Régime de l'insolation

La figure 6 présente le régime de l'insolation dans la zone d'étude.

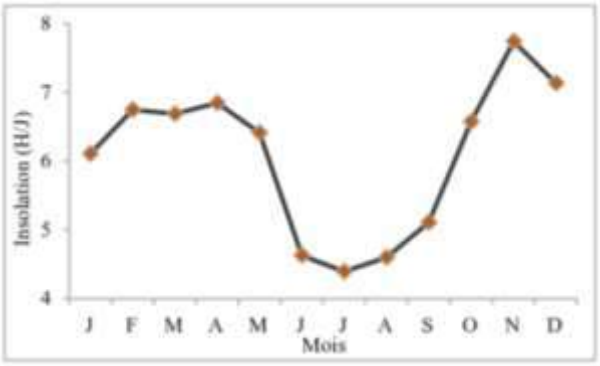

Figure 6 : Régime de l'insolation (moyenne mensuelle) de 1988 à 2018 dans la zone d'étude

La figure 6 montre que la durée journalière de l'insolation est comprise entre 4,39 heures et 7,74 heures. Sur l'ensemble, deux grandes phases se démarques à savoir : la première qui englobe les cinq premiers mois de l'année (janvier à mai) auxquels s'ajoutent les trois derniers mois de l'année (octobre à décembre). Cette première phase montre des valeurs élevées de l'humidité relative. La deuxième phase quant à elle, est celle où les valeurs de l'humidité relative sont basses. Cette phase couvre les mois de juin, juillet et août. Cette période coïncide avec la saison pluvieuse. C'est d'ailleurs la période où s'observe les maximums pluviométriques. La nébulosité est donc bien développée, et représente un frein à la pénétration des radiations solaires.

2.2. Implication de la variabilité climatique sur la culture du manioc dans la zone d'étude

2.2.1. Indice de l'écart à la valeur minimale et bilan climatique

La figure 7 présente l'indice de l'écart à la valeur minimale (Emini) et le bilan climatique mensuel de 1988 à 2018.

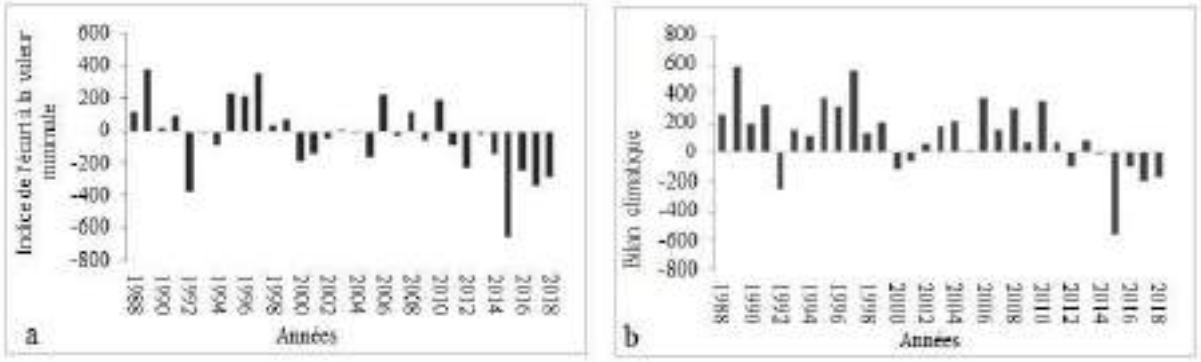

Figure 7 : Indice de l'écart à la valeur minimale (a) et bilan climatique (b) de 1988 à 2018 dans la zone d'étude

La figure 7a montre que les années de Emini négatif sont de 58,07 % et de Emini positif sont de 41,93 %. La présence des années où l'écart minimal est négatif traduit qu'au cours de ces trente dernières années le besoin minimum pluviométrique pour une bonne production des racines de manioc n'a pas été satisfait. L'analyse de la fréquence des années de déficit pluviométrique a montré des successions d'années déficitaires de 2011 à 2018. Au cours de cette période, la culture du manioc a subi des stress hydriques, ce qui a assurément perturbé la production de manioc dans la zone d'étude.

L'analyse de la figure 7b montre, quant à elle, que les années pendant lesquelles le bilan climatique est déficitaire sont de 29,03 % contre 70, 97 % pour les années excédentaires. Le bilan climatique des années 2015 à 2018 confirme les déficits en eau des cultures de manioc. Ces années ont été particulièrement sèches. Ce qui pourrait entrainer la baisse des rendements au cours de ces années. Plusieurs années exceptionnellement pluvieuses ont été enregistrées (1988, 1989, 1990, 1991, 1996, 1997, 2006, 2007, 2008 et 2010. Tous ces paramètres influencent la production des racines de manioc.

2.2.2. Production de manioc et contraintes pluviométriques

La culture du manioc est en général exigeante en eau, soit au moins 1000 mm d'eau et au plus1400 mm d'eau par saison agricole (IITA, 1982). Les précipitations constituent donc un élément majeur pour la culture et le rendement de manioc. Or, les précipitations impactent les cultures à travers des excès et des déficits, rendant vulnérable la production agricole. Selon IITA (1982), grâce à ces racines tubéreuses, le manioc peut supporter 4 à 6 mois de sécheresse. La figure 8 permet d'apprécier la relation entre la pluviométrie et la production de manioc.

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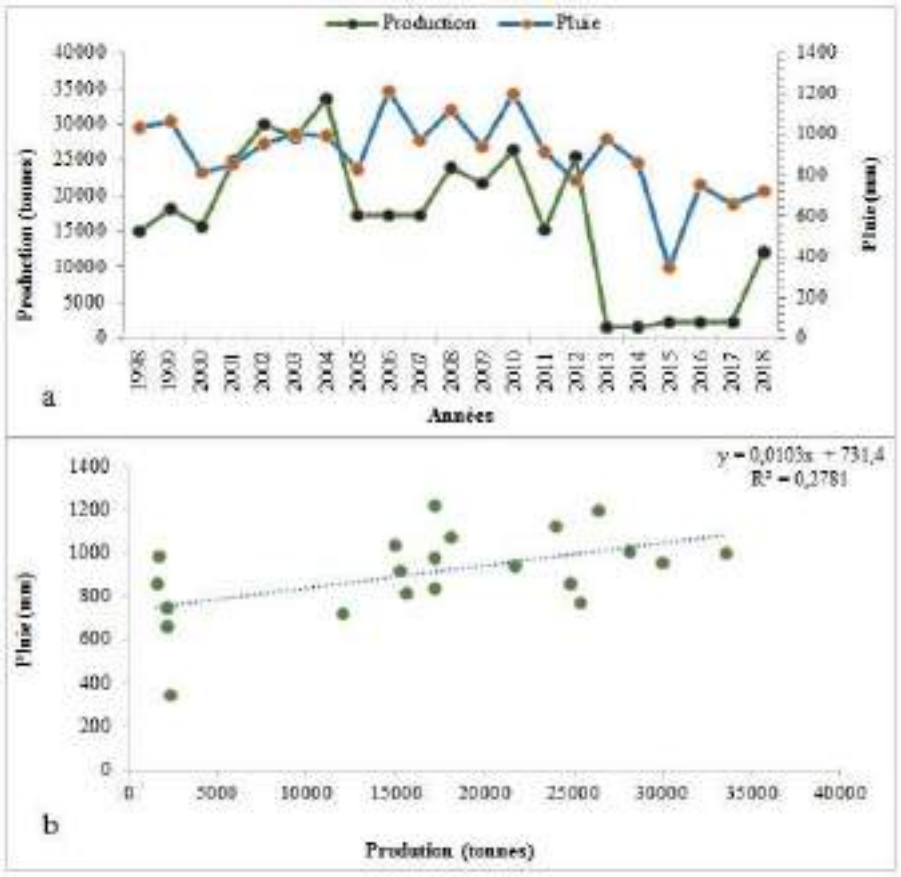

Figure 8 : Relation entre la production de manioc et les précipitations de 1998 à 2018 dans la zone d'étude

De l'analyse de la figure 8a, il ressort que de bons rendements de manioc ont été obtenus aussi bien en année humide qu'en année sèche. Pour preuve, l'année 2001, malgré sa pluviométrie de 854,3 mm qui n'est pas favorable à la culture de manioc, enregistre une production de 24 900 tonnes, laquelle est la troisième meilleure production entre 1998 et 2018. Ceci montre que la pluviométrie n'est pas le seul paramètre qui conditionne la production du manioc dans la zone d'étude bien qu'il soit le plus important. En effet, la capacité de rétention d'eau des sols de la zone d'étude, l'augmentation des superficies emblavées, la fertilité des terres, la densité des plantages et la qualité du matériel végétal sont également des facteurs bonificateurs de la production (Darbin et Maignien, 1979 ; Poss et Rossi, 1987 ; Azontondé, 1991 ; INRAB, 1997 ; Beauchamp, 2001, Agbéko, 2003 ; Cornet, 2005 ; Ogouwalé, 2006). Le faible niveau de corrélation entre la production du manioc et les précipitations dans la zone d'étude (figure 8b) avec un coefficient R = 0,27 (soit 27 % de dépendance) confirme cette mulidimensionnalité de la production de manioc dans la zone d'étude. La quantité de pluie reçue n'est donc pas ce qui est important, mais surtout sa répartition dans le temps et dans l'espace.

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2.2.3. Production de manioc et contrainte thermométrique

L'irrégularité thermométrique annuelle influe aussi sur la production de manioc (figure 9).

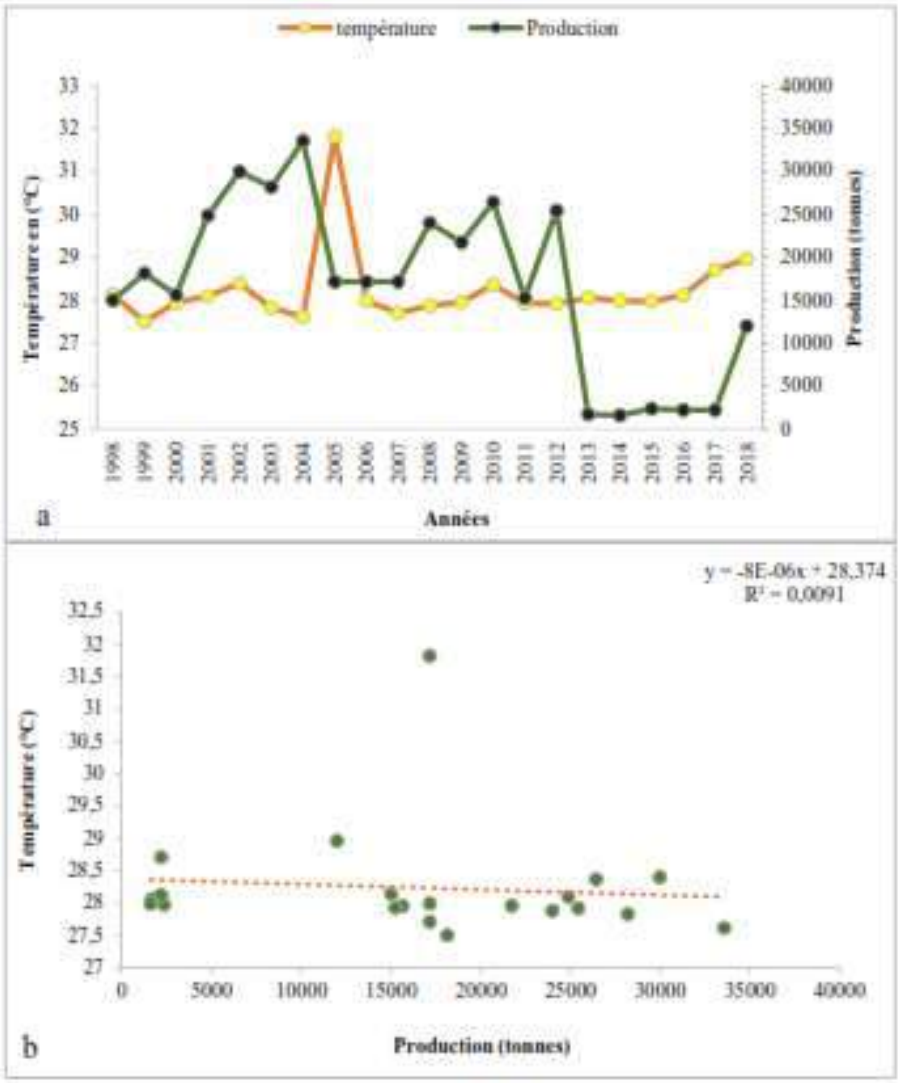

Figure 9 : Relation entre la production de manioc et la température de 1998 à 2018 dans la zone d'étude

L'analyse de la figure 6a montre que l'évolution de la température et de la production de manioc est faite de façon totalement disharmonieuse. Ce qui laisse penser que la production de manioc ne dépend pas de la température dans la zone d'étude. Cette appréhension est confirmée par la corrélation nulle (figure 9b) avec R2 = 0,009 entre la température et la production de manioc dans la zone d'étude. Cependant, ce résultat peut avoir été "biaisé" par les autres facteurs énumérés ci-dessus au niveau de l'analyse de la relation entre les précipitations et la production de manioc dans la zone d'étude.

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2.2.4. Production de manioc et contrainte hygrométrique

La figure 10 présente la relation entre l'humidité relative et la production du manioc dans la zone d'étude.

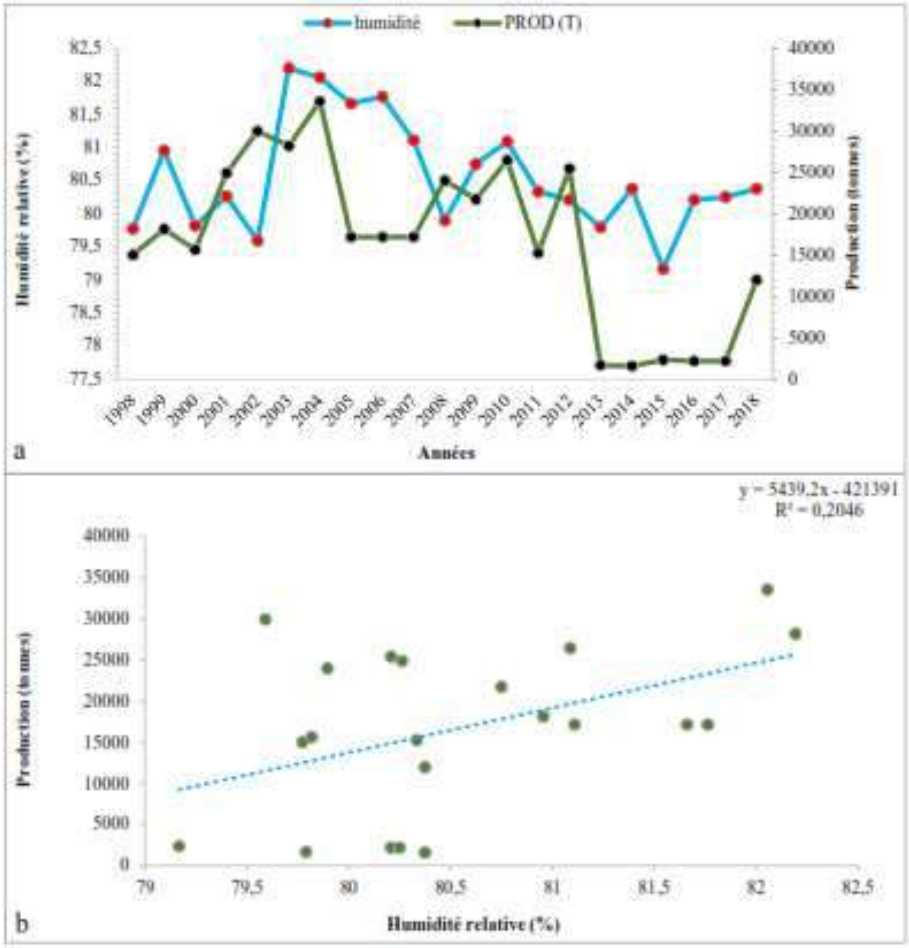

Figure 10 : Relation entre la production de manioc et l'humidité relative de 1998 à 2018 dans la zone d'étude

La variation de l'humidité relative commande l'ouverture et la fermeture des stomates des plantes. L'analyse de la figure 10a montre que l'humidité relative et la production du manioc évoluent de façon relativement similaire. Ce qui suggère que la production du manioc dépend plus ou moins de l'humidité relative. Cependant, la figure 10b ne justifie cette dépendance qu'à hauteur de 20 % (R2 = 0,20). Il n'est pas superflu de préciser que l'humidité relative est étroitement liée à la température. Par ailleurs, comme pour les précipitations et la température, la capacité de rétention d'eau des sols de la zone d'étude, l'augmentation des superficies emblavées, la fertilité des terres, la densité des plantages et la qualité du matériel végétal, peuvent inhiber ou bonifier l'impact positif de l'humidité relative dans la production du manioc dans la zone d'étude.

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2.2.5. Production de manioc et contrainte d'insolation

La figure 11 présente la relation entre l'insolation et la production du manioc dans la zone d'étude.

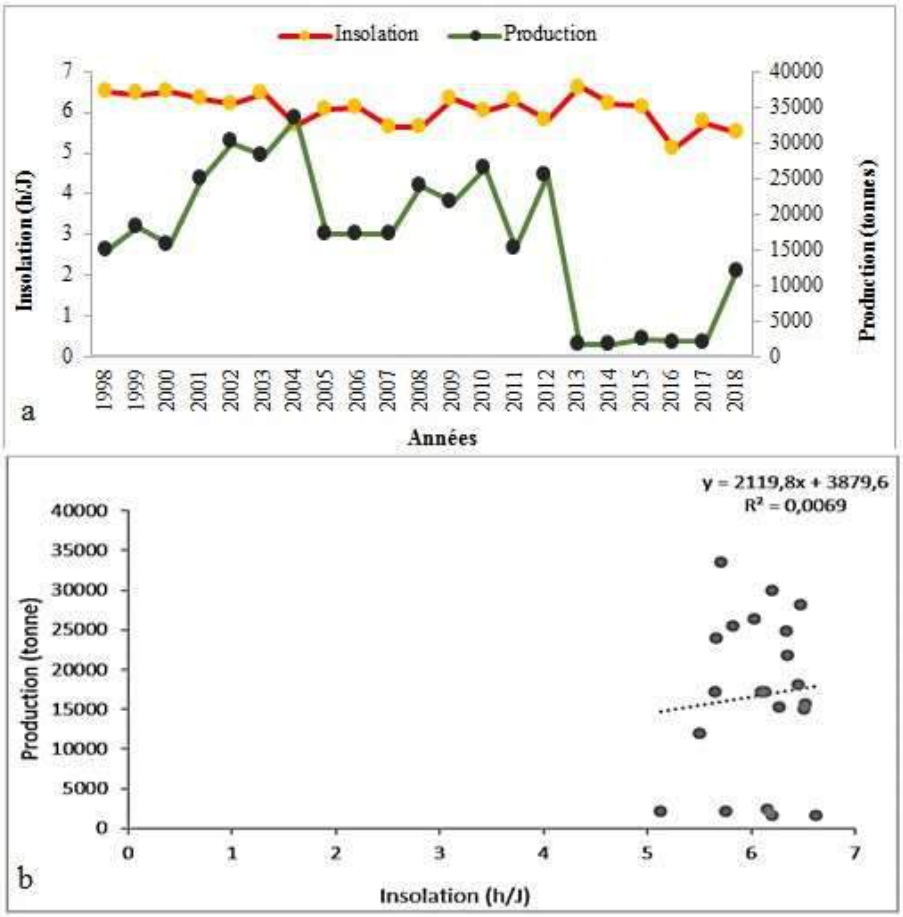

Figure 11 : Relation entre la production de manioc et l'insolation de 1998 à 2018 dans la zone d'étude

L'évolution comparée de l'insolation et de la production de manioc sur la figure 11a montre une évolution très disproportionnelle. Ceci suggère que l'évolution de l'un n'influe pas sur l'autre. Par ailleurs, cette déduction se confirme aisément par la figure 11b qui montre une corrélation nulle entre l'insolation et la production du manioc avec R = 0.

2.3. Perception paysanne des changements climatiques et de leur impact sur la production de manioc

Les connaissances des producteurs des changements climatiques dans la zone d'étude constituent des savoirs locaux axés sur des vécus. Les résultats issus des enquêtes, révèlent que ces derniers (100 %) perçoivent incontestablement les effets des changements climatiques.

Pour la totalité des producteurs consultés dans la zone d'étude, leur milieu connaît une modification des paramètres climatiques. Pour eux, ceci est due essentiellement aux activités humaines (55 %), à la volonté de divine (35 %) et à une modification cyclique des paramètres climatiques (12 %). Selon 95 % des agriculteurs consultés, le retard de la grande saison pluvieuse, l'irrégularité de la pluie, la chaleur excessive, les poches de sécheresse en saison de pluie, les inondations. Cette évolution du climat dans la zone d'étude affecte diverses étapes de mise en place de la culture du manioc (préparation du sol, semis, fumure, entretiens divers), empêchant ainsi le bon développement des plants de manioc. Tout ceci entraine la modification du calendrier cultural en fonction de la pluviométrie (69 %).

2.4. Autres facteurs d'impacts sur la production du manioc

Le manioc (Manihot esculenta, Crantz) est très sensible à la mosaïque africaine, à la bactériose et diverses pourritures des racines. Environ 80 % des agriculteurs ont confirmé qu'au moins 10 % de leurs productions sont affectés par des facteurs autres que le climat. Par exemple, les troupeaux de bœufs en transhumance rendent le sol lourd. Cela ne permet pas au manioc de se développer dans les buttes or cette culture nécessite des sols légers et bien drainés (Mémento de l'agronome, 2002). Pour 71 % des

SJIF Impact Factor 2022: 8.197| ISI I.F. Value: 1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 7 | Issue: 12 | December 2022 - Peer Reviewed Journal

producteurs consultés, les actions destructives des insectes et des rongeurs affaiblissent également les rendements. La planche 1 montre des racines de tubercules attaquées par des termites.

Planche 1 : Images de racines de manioc attaqué par les termites (a) et feuilles de racine de manioc attaquées par les insectes (b)
Prise de vues : SEBO VIFAN, Juin 2020

2.5. Stratégies d'adaptation des agriculteurs face à l'évolution des paramètres climatiques

Dans le but d'améliorer la production du manioc, malgré les conditions climatiques contraignantes, les agriculteurs ont confirmé utiliser plusieurs stratégies adaptatives dont :

- **Augmentation des emblavures**

Dans la zone d'étude, l'extension des surfaces cultivables par les producteurs (60 %) est l'une des réponses aux changements climatiques, pour accroitre les rendements agricoles. Il faut retenir que cette stratégie ne pourra pas être efficace longtemps dans ce contexte de changement climatique. Mais elle accentuera les risques d'insécurité alimentaire pour les générations futures, si les tendances actuelles conjuguées à celles démographiques se maintiennent.

- **Changement des techniques de mise en terre des tiges de manioc**

Pour réduire les effets des changements climatiques sur la production du manioc, la quasi- totalité (84 %) des paysans changent l'orientation des tiges de manioc.

- **Association culturale**

Pour augmenter les rendements de manioc, les producteurs associent le champ de manioc avec les champs de maïs. Ce qui fait bénéficier les champs de manioc des engrais reçu par la culture de maïs. Selon les résultats issus des travaux de terrain dans le cadre de ce travail, cette stratégie est développée par (58 %) des producteurs.

Photo 1 : Association du manioc avec du maïs
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- **Choix du matériel végétal**

La productivité du manioc dépend aussi des aptitudes propres du matériel végétal utilisé qui sont liés à sa constitution génétique. Ainsi, les enquêtes de terrain ont révélés que 69 % des producteurs optent pour une gamme de variétés traditionnelles qui sont le résultat d'une sélection empirique faite par les paysans à partir de pieds issu de graine qui poussent dans les champs abandonnés. Selon eux, ces variétés sont souvent très productrices et résiste plus aux maladies.

2.6. Stratégies d'adaptation à promouvoir en communion par les deux États

Pour les institutions locales : - d'élaborer une chaine de surveillance et d'avertissement contre les maladies et les insectes, - mettre à disposition des producteurs des variétés de boutures résistantes aux effets des changements climatiques, - renforcer les systèmes de vulgarisation agricole, - investir durablement dans la recherche et l'innovation agricole participatives. A l'endroit des producteurs agricoles il serait bien de leur part : - de bien mettre en pratique les consignes faites par les accompagnateurs, - de faciliter la tâche aux chercheurs en coopérant.

3. CONCLUSION

Au terme de ces travaux, les résultats montrent que la zone d'étude est bien soumise aux effets des changements climatiques. On assiste dans l'ensemble à une alternance d'année déficitaire et excédentaire. Bien que l'étude des paramètres comme la température, l'humidité relative et de l'insolation n'aient pas montré de véritables impacts sur la production du manioc, cette dernière reste néanmoins soumise aux effets des changements climatiques dans la zone d'étude. De ce fait, les producteurs ont adopté plusieurs stratégies d'adaptation : il s'agit de l'actualisation à l'échelle locale du calendrier agricole, de l'augmentation des emblavures, de l'association culturale, etc. Au regard de l'importance de l'évolution des paramètres climatiques dans la zone d'étude et de leurs implications directes sur la production de manioc, il s'avère nécessaire pour les deux états de prendre en compte les recommandations issues de ce travail de recherche afin de réduire durablement les effets des changements climatiques sur la production des racines de manioc.

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