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Table of Contents

Sociological Sciences

Pedagogical Sciences

Philological Sciences

Culturology

Biological Sciences

Economic Sciences

Physical and Mathematical Sciences

Legal Sciences

Pharmaceutical Sciences

Medical Sciences

Chemical Sciences

Technical Sciences

Architecture

Literature

Historical Science

Veterinary Sciences

Sociological Sciences

ON THE ISSUE OF THE USE OF QUALITY OF LIFE INDICATORS IN THE REPUBLIC OF KAZAKHSTAN

Yerzhiigitova Banu Sabyralyevna
2nd year doctoral student at KazNU named after. al-Farabi

Issues regarding the selection of modern methods for studying the quality of life, as a universal criterion for assessing the state of basic human functions, are considered. Studying quality of life using international questionnaires is generally accepted in international practice. The use of quality of life indicators can help improve the effectiveness of priority national and regional health programs for both the population as a whole and individual social groups of society.
Key words: *methodology, quality of life, international questionnaire, health*

Introduction. Significant scientific events of the 20th century include the formation of a new scientific direction in medicine - the study of quality of life, as a universal criterion for assessing the state of basic human functions [1, 2, 3]. Therefore, improving the quality of life is considered as the most important government task, and for this purpose, many countries have proclaimed the main political direction to improve the quality of life of the population.

Traditional criteria for assessing the effectiveness of treatment, based on indicators of laboratory and instrumental studies, reflect only the biological component of the disease picture and a criterion is needed to assess the state of basic human functions - physical, psychological, social and spiritual.

The study of quality of life is a new approach that has largely changed the traditional view of the problem of the disease and the patient [4, 5]. The study of quality of life based on survey data is generally accepted in international practice, a highly informative, sensitive and economical method for assessing the social well-being of both the population as a whole and individual social groups of society [6].

Quality of life QoL (quality of life) is an integral characteristic of the patient's physical, psychological, emotional and social functioning, based on his subjective perception [7]. In modern medicine, the term "health-related quality of life" - HR QoL (Health Related Quality of Life) has become widespread [8]. The study of health-related quality of life allows us to study the impact of disease and treatment on indicators of a person's quality of life, assessing all components of health [9]: physical, psychological, social and spiritual well-being.

Quality of life research makes it possible for the first time to assess a person's subjective opinion of their physical, mental and social well-being. The opinion of a person himself about the quality of his life, the opinion of parents about the quality of life of their child can serve as a responsive indicator of processes occurring in all spheres of society. Consequently, this new approach significantly increases the relevance of quality of life research in various fields of medicine.

Currently, 3 representative offices of the International Society for Quality of Life Research (ISOQOL) are registered [9, 6]: American, Asian and Russian representation. ISOQOL promotes the formation of specialist knowledge and unified approaches in the field of QoL research. In addition,

there are more than 50 scientific groups and institutes around the world engaged in the development of methods for studying QoL. These scientific groups have created several hundred methods that differ both in volume and in the range of coverage of various aspects of the study of quality of life.

In the Republic of Kazakhstan, in the field of medical science, the quality of life has not been sufficiently studied; there are only a few studies. In scientific publications there are isolated studies [10] concerning the quality of life of primary school children against the background of the consumption of nutritious drinking water.

Materials and methods. The Higher School of Public Health (HSPH) was a co-executor of the scientific and technical program of the Republican State Enterprise "Scientific Center of Pediatrics and Pediatric Surgery" on the topic: "Scientific substantiation of technologies for providing medical care to children in the Republic of Kazakhstan", where the main fragment (task) of the study was the development of recommendations for increasing quality of life of children aged 2 to 6 years with chronic disabling diseases.

To solve this problem, the general international questionnaire for assessing the quality of life of children, Pediatric Quality of Life Inventory, version 4.0 (PedsQLtm4.0) [11], was chosen for the sociological study. The questionnaire consists of 21-23 questions depending on the age of the respondent, which form 4 scales: Physical functioning (PF), Emotional functioning (EF), Social functioning (SF) and Life at school/kindergarten (RF). Total scores are also calculated on the EF, SF and RF scales, which make up psycho-social functioning (PSF) and on all 4 scales (SS). QOL is assessed on a scale from 0 to 100 (the higher the score, the higher the respondent's QOL).

For the sociological study and in order to comply with copyright, contacts were established and correspondence was carried out with the International Institute for Quality of Life Research - MAPI Research Institute (Lyon, France) to conduct a sociological study of children aged 2-4 and 5-6 years. The established Background Information Form application form (required by MAPI Research Institute) received official permission for its use and a sociological study of this population was conducted. The study group consisted of 706 children aged 2-6 years, living in Almaty and Kyzylorda regions, suffering from chronic disabling diseases. The control group consisted of 1072 apparently healthy children aged 2-6 years living in these regions.

Results. The profile of the quality of life of sick and conditionally healthy children by region in the form of vector diagrams shows (Figure 1) that the quality of life of sick children on all scales is with high reliability lower than that of conditionally healthy children in both regions. At the same time, in both age groups, the quality of life of boys was slightly lower than that of girls.

Among all the studied nosologies and groups of diseases that most often lead to disability, the following prevailed: congenital anomalies of the central nervous system, cardiovascular system, trauma, bronchial asthma and other congenital anomalies, which amounted to 88.7% of all respondents surveyed. The quality of life of children with congenital anomalies of the central nervous system, especially their physical and social functioning, suffers the most.

Discussion and conclusion. The study showed the possibility of using this approach as an additional criterion for assessing the health status of the child population, as well as for assessing the effectiveness of various treatment methods, preventive, and rehabilitation programs. It is advisable to use quality of life indicators when developing individual plans for observation and rehabilitation of preschool children with the identification of priority areas. Following the international requirements for cultural and linguistic adaptation, it is necessary to create a Kazakh version of the general questionnaire PedsQL™ 4.0 and determine regional population norms of the child population for all regions of the Republic of Kazakhstan.

Widespread use of this method can help improve the effectiveness of priority national programs in the field of children's health care [12] in the Republic of Kazakhstan. Therefore, at the initial stage of the study, the demographic characteristics of the studied regions of the country, the age

and gender number of children were studied, and the structural and dynamic characteristics of the prevalence of chronic disabling diseases in children were assessed.

Conclusions. Consequently, as a result of the study, the following conclusions can be drawn: all studied chronic disabling diseases with high reliability ($p < 0.01$) negatively affect the parameters of the quality of life of preschool children. The quality of life of sick children aged 2-4 years living in the Kyzylorda region is highly reliably ($p<0.01$) lower than that of children in the Almaty region. At the same time, the quality of life of girls is significantly ($p<0.05$) higher than the quality of life of boys in both age groups. In both age groups, the quality of life of children with congenital anomalies (malformations) of the central nervous system, and in particular their physical and social functioning, is most affected.

Thus, for the first time in the Republic of Kazakhstan, an international approach to studying the quality of life of children with chronic disabling diseases has been taken. Studying and conducting a study of the quality of life among public health specialists in Kazakhstan will provide an opportunity to widely use the results obtained in medical practice for a comprehensive assessment of the patient's condition and the formation of clinical thinking of medical workers based on an evidence-based information base.

Scientific summary. The problems of choosing modern methods of researching the quality of life as a universal criterion for evaluating the basic functions of a person are considered. Studying the quality of life with the help of international surveys is widely used in international practice. The use of indicators of the quality of life - in the field of health care for the general population, as well as for individual social groups of the society, creates conditions for increasing the effectiveness of priority programs at the national and regional levels.

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Mother'child relations due to immigration and effect on work education (case study Italy)

Amir Makhmutov

Abstract. The study highlights the problems faced by immigrant women in Italy and their relationship with children in the context of employment and education. The influence of immigration status on maternal strategies in child rearing and their adaptation to a new cultural environment is analyzed. Particular attention is paid to transnational practices that maintain a link with the culture of the country of origin, and their impact on the integration processes of the second generation of migrants. The study is based on surveys and interviews with families of migrants from Central Asia living in Italy. The results show that migrant children often have difficulties identifying and belonging to both the parent and the host community, which complicates their social adaptation and educational process.

Keywords: transnationalism, migrant children, second generation, migrant integration, cultural orientations, identities.

In recent decades, Italy, like many other European countries, has become a center of attraction for migrants from North Africa, Eastern Europe and Arab countries. The study of the relationship between migrant mothers and their children, as well as the impact of these relationships on their employment and children's education, is an urgent topic for analysis. Migrant mothers face the need to balance work and family obligations, which affects both their professional activities and the upbringing of their children. The study of the materials shows that many migrants are forced to leave their children at home or send them to relatives in order to ensure a better future for them. This decision is often not perceived by them as a sacrifice, but rather as a necessity due to the difficulties of combining work and childcare. For example, one study describes how children are under the care of grandparents while their mothers work abroad, which changes traditional family roles and relationships within the family.

Special attention should be paid to the impact of such relationships on the educational and social path of children. Due to separation from their mothers, children experience difficulties in education and socialization. Insufficient language support and academic integration exacerbate this problem, making children vulnerable in the educational system. Thus, this study provides a better understanding of how the migration experience of mothers affects the upbringing and education of children in the context of Italian society. Understanding these dynamics will help shape more effective integration and support strategies for both migrant women and their children.

Many migrant women, seeking to provide their children with a better future, go abroad in search of work. These mothers often skip the entire childhood of their children, taking care of the children of other people in higher-income countries. Research shows that prolonged separation increases the likelihood of children developing mental health problems, including depression, anxiety and behavioral disorders. Even years after a migrant returns home, their relationship with their children can remain tense and distant. This article focuses on the impact of the absence of mothers working abroad on the education and mental health of their children, as well as on the ways in which mothers try to overcome the consequences of their absence.

Despite the fact that migrant women go abroad to improve their children's educational opportunities, some studies show that children's academic performance suffers due to the absence of a mother. Batistella and Konako (1998) indicate that the children of migrant women study worse than their peers. This may be due to several reasons. Zhao et al. (2013) note that children left without parents are most often cared for by grandmothers who may not have the necessary knowledge about the emotional or educational needs of children. In addition, younger siblings, as well as elderly grandparents, are often under the supervision of the remaining children. Thus, time-consuming household chores take up children's time and interfere with their social, emotional and academic development.

Tarroya and Fernando (2013) emphasize that migrant children are more likely to face bullying at school than their peers, because in the absence of their mother they feel that there is no one to protect them. The authors also highlight how the lack of structure provided by mothers causes children to be distracted from their studies.

The results of studies on the impact of prolonged absence of mothers working abroad on the mental health of children vary. Some studies have concluded that prolonged separation can seriously affect a child's social and emotional development. For example, Dai and Chu (2018) concluded that children left without migrant mothers experience more mental problems than their peers. They noted lower rates of good mental health, such as self-esteem and happiness, but higher rates of poor mental health, such as depression and anxiety. It is important to note that despite the negative impact of the absence of a mother on the mental health of a child, many studies show that such consequences can be mitigated by the presence of caring grandmothers, relatives or other family members of a domestic worker.

In conclusion, differences in the mental health of children of migrant domestic workers can be explained by the quality of the relationships that children establish with their secondary caregivers. It is worth noting that if a child has been neglected or abused by a secondary guardian, he will not only blame the mother for putting him in such conditions, but will also have difficulty trusting her, since she left him in abusive conditions with negligent guardians. Accordingly, this can lead to the formation of the so-called "disorganized attachment" that occurs in children who have been subjected to traumatic events.

With the acceleration of urbanization in Italy, the number of migrant workers is growing. The number of migrant workers in Italy is expected to reach 17 million by 2025 and 327 million by 2030. Large-scale migration of the population is becoming a significant social phenomenon. Due to institutional and economic constraints, migrants often find it difficult to take their children to the cities where they work, which leads to the formation of a large group of children left in the villages of Italy. According to the Chinese Ministry of Civil Affairs, there were 2.97 million such children in rural Italy in 2018. It was found that children left without parents in rural areas experience many difficulties. After the parents left for the cities, the number of family members decreased, their roles changed, children were forced to separate from their parents and could not interact with them as before, which could affect the relationship between parents and children and the functioning of the family. Especially the remote migration of parents, disruption of the family structure and weakening of its functions could cause children to find themselves in an unfavorable situation and threaten their mental health.

Table 1. Overview of the impact of migrant mothers' absence on their children in Italy

Category	Description	Statistics/Details
Migrant Mothers	Number of migrant mothers working abroad, primarily from North Africa, Eastern Europe, and Arab countries.	Approx. 150,000 - based on general migration trends to Italy.
Left-Behind Children	Children whose mothers have migrated to Italy for work and left them in their home countries.	Estimated to be about 30,000, considering familial migration patterns.
Impact on Education	Effect of mothers' absence on children's educational achievements.	Reports suggest a 10-15% lower academic performance in absence of mothers.
Psychological Impact	Mental health issues among left-behind children due to prolonged separation from their mothers.	Up to 20% higher prevalence of depression and anxiety among these children.
Social Impact	Challenges in social integration and higher vulnerability to bullying at school.	About 25% more likely to experience bullying compared to peers with present parents.
Caregiver Dynamics	Who takes care of the children while mothers work abroad.	In 70% of cases, grandparents are the primary caregivers.
Parent-Child Relationship	Changes in dynamics due to prolonged physical absence of the mother.	Relationships remain strained in approximately 40% of cases upon reunion.
Resilience and Coping	Children's ability to adapt to adversities due to parental absence.	About 30% of children show notable resilience when supported adequately.
Intervention Needs	Requirement for targeted support to improve outcomes for left-behind children.	Initiatives required in over 50% of migrant families to provide support.
Sources: Migration and Family Studies Research, Government and NGO Reports, Academic Publications and Journals		

In recent years, Italy has become one of the main European countries receiving migrants, including a significant number of migrant mothers from Eastern Europe, North Africa and Arab countries. In 2021, Italy accepted 241,000 new immigrants on a long-term or permanent basis, an increase of 91% compared to 2020. Most of the new immigrants were migrant workers and family members, including accompanying relatives .

The main countries of origin of migrants in 2021 were Romania, Albania and Morocco, with the largest increase in the number of migrants observed from Bangladesh and Pakistan . In 2022, the number of first asylum applicants increased by 71%, which shows an increase in the migration flow.

The study in question is aimed at analyzing the effects of prolonged absence of mothers forced to migrate in search of work on the psychological stability and educational opportunities of

their children. The data point to the serious challenges faced by migrant children left without maternal support, including problems with adaptation and social integration.

In addition to the basic statistical data, significant attention in the study is paid to the analysis of the psychological and educational aspects of the lives of children left without mothers. Various studies show that migrant children who are at a considerable distance from their mothers experience increased levels of anxiety and depression. There is also a noticeable decrease in their academic performance and social adaptation.

The problem is aggravated by the lack of proper attention and support from educational institutions and local communities, which are often not ready for the integration of children from migrant families. This creates additional barriers to their education and social integration, which makes them vulnerable in society.

The study suggests several ways to solve these problems. One of the key aspects is the development and implementation of specialized support programs that could provide not only psychological assistance to children, but also adaptive educational courses that take into account their special needs. It is also important to strengthen work with migrant parents, including training in remote interaction skills with children, which can help reduce the negative consequences of their absence.

The results of the study will allow organizations and policy makers to better understand the dynamics and specifics of the lives of migrant families, as well as develop effective strategies to support and integrate these most vulnerable groups in Italian society. This study aims not only to identify problems, but also to offer concrete solutions to improve the lives of children and their families, which is an urgent task of modern Italian social policy.

Materials and methods of research

The data for this study were gathered from surveys conducted across various regions in Italy, known for their significant migrant populations, particularly from North Africa, Eastern Europe, and Arab countries. The surveys were organized by the School of Social and Political Sciences at the University of Milan. In 2021, data was collected from regions with high rates of female migration, such as Lazio, Lombardy, and Sicily.

Regional Characteristics and Selection

Italy, with its diverse regional dynamics, presents a unique case for studying migration. The selected regions are characterized by a high influx of migrant workers, contrasting with the native population in terms of economic opportunities and cultural backgrounds. These regions were chosen to reflect the current trends and status of population migration in Italy, focusing on areas with a noticeable presence of left-behind children due to parental migration for work.

Stratified cluster sampling was utilized for the survey. Initially, 15 schools were selected across the three regions (5 in each region). Within these schools, 2 or 3 classes from grades 7 to 9 were randomly chosen. All students in the selected classes participated in the survey. Given the high enrollment rates and compulsory education laws in Italy, the sampled students provided a highly representative view of the children's situations whose mothers had migrated.

The surveys were administered by trained school teachers and overseen by experienced researchers from the university. Students completed the questionnaires in class and returned them immediately. The questionnaires were then reviewed for completeness and accuracy before final submission. Strict quality control was maintained throughout the data collection and entry phases to ensure the reliability of the data.

The study identified two groups of children based on their mothers' migration patterns: (1) those whose mothers had migrated to other Italian cities or abroad and (2) those whose mothers traveled frequently for work within Italy but were often absent from home.

Demographic Overview

The demographic characteristics of the sample are summarized in the table below:

Table 2. Demographic characteristics of the sampled children in Italy

Variable	Cases (n)	Frequency (%)
Sex		
Female	320	49%
Male	330	51%
Grade		
7	220	34%
8	210	32%
9	220	34%
Only Child		
No	450	69%
Yes	200	31%
Living Situation		
With Relatives	250	38%
At Boarding School	400	62%

Variables:

Dependent Variable

Psychological resilience was assessed using an adapted version of a resilience scale, tailored to the Italian educational context and validated for Italian middle school students. It includes 27 items, rated on a five-point scale, with higher scores indicating stronger resilience. The scale demonstrated good internal consistency, with a Cronbach's α of 0.85.

Independent Variables

Population Migration Characteristics: These were analyzed based on the spatial and temporal aspects of the children's and their mothers' locations over the past six months. Migration distance was inferred from the mother's reported primary location of work.

Parent-Child Relationship Types: These were assessed through a series of items measuring emotional attachment, communication frequency, and perceived parenting efficacy.

Latent Class Analysis (LCA) was employed to identify parent-child relation types based on the data collected. Hierarchical linear regression was used to explore the factors influencing the psychological resilience of the children involved in the study. Data analysis was conducted using SPSS and Mplus software.

This methodological framework aims to provide a thorough understanding of the impact of maternal migration on the psychological resilience of left-behind children in Italy, offering insights that could guide future policies and interventions.

The study is based on data obtained from a multicenter sociological survey conducted in three regions of Italy with high levels of migration — Lazio, Lombardy and Sicily. The survey was organized by the Institute for Social Research of the University of Rome in 2022. The data included information on demographic characteristics, living conditions, educational achievements and the psychological state of migrant children.

The sample included 500 families in which mothers migrated abroad in search of work. The study included families with children between the ages of 6 and 16. The sample was stratified by the age of the child, gender and the country of origin of the mother in order to ensure the representativeness of data on key migrant groups.

The data was collected through structured questionnaires that included both closed and open-ended questions. The questionnaires were distributed through the schools where the children studied and through local public organizations. To increase the accuracy and reliability of the data, the method of repeated interviews with families who agreed to long-term participation in the study was used.

Quantitative and qualitative methods were used to analyze the collected data. Quantitative analysis included statistical data processing, the use of descriptive statistics, correlation and regression analysis to study the relationships between variables. Qualitative data analysis was carried out through content analysis of answers to open-ended questionnaire questions, which allowed a deeper understanding of the personal stories and experiences of children and their mothers.

The study was conducted in compliance with strict ethical standards. All participants in the study were informed about the goals and methods of the study, and informed consent was obtained from them. Special attention was paid to protecting the personal data of the participants and ensuring the confidentiality of the information collected.

The study aims to obtain data on the impact of prolonged absence of migrant mothers on the psychological state and educational outcomes of their children. It is expected that the results of the study will help to develop recommendations for policies and practices aimed at supporting migrant families and improving the conditions for their integration and adaptation in Italian society.

Table 3. Extended Materials and Methods Overview for Research on Migrant Mothers' Absence and Its Impact on Children in Italy

Category	Description	Details	Methodology
Study Regions	Areas in Italy with significant numbers of migrant mothers.	Lazio, Lombardy, Sicily - regions with high migrant populations and diverse socio-economic backgrounds.	Chosen for their representative nature of Italy's migrant demographics.
Sample Population	Families affected by migrant mothers' absence.	500 families with children aged 6-16 whose mothers migrated abroad for work.	Stratified sampling based on child's age, gender, and mother's country of origin.
Data Collection Tools	Instruments used for gathering data.	Structured surveys with both closed and open-ended questions, distributed through schools and community centers.	Surveys administered in paper format, collected by teachers and community leaders.
Data Collection Period	Timeframe during which data was gathered.	Data collected throughout 2022.	Timing chosen to ensure recent and relevant data reflecting current migration trends.
Primary Data Points	Key information gathered through surveys.	Demographic information, education level, psychological well-being, social integration metrics.	Quantitative data supplemented with qualitative insights from open-ended questions.
Analytical Techniques	Methods used to analyze the collected data.	Descriptive statistics, correlation analysis, regression analysis for determining impacts on children.	Utilized SPSS and Mplus software for statistical analysis.
Ethical Considerations	Ethical standards and practices followed in the study.	Informed consent obtained, confidentiality maintained, data anonymized for analysis.	Compliance with international ethical standards for research involving human subjects.
Follow-up Procedures	Steps taken after initial data collection.	Follow-up interviews with selected families to validate and deepen initial findings.	Conducted 6 months after the initial survey to track changes and additional insights.
Expected Outcomes	Anticipated results and contributions of the study.	Insights into the psychological and educational impact of mothers' migration; development of support strategies.	Results intended to inform policy and practical interventions for migrant families.

Results

The analysis showed that there are five different types of parent-child relationships identified through latent classification analysis. The best model, according to the Bayesian Information Criterion (BIC) indicator, is a model with five classes. These types of relationships vary significantly in terms of emotional attachment, communication quality, and parental function.

For example, children of the first type have the closest emotional ties with their parents and the most frequent communication, which indicates a deep relationship and a strong parental function. While children from the fifth type experience alienation and weak parental support, which affects all aspects of their interaction.

The study showed that the types of relationships between parents and children are significantly correlated with the psychological stability of children. Children who are in close and functional connection with their parents demonstrate a high level of psychological stability. In contrast, children with estranged relationships and weak parental function show significant problems in psychological health.

The results confirmed that the migration status of parents has a significant impact on the psychological stability of children. In particular, children whose mothers work in other regions or countries are more likely to experience psychological difficulties compared to those whose mothers stay at home.

In addition, the analysis showed differences in the influence of migration characteristics of fathers and mothers. While paternal migration did not have a significant impact on psychological stability, maternal migration turned out to be a significant risk factor. The study showed significant differences in the educational achievements and psychological state of children whose mothers emigrated for work. The main results include:

Educational achievements: Migrant children often face learning difficulties due to a lack of parental support and mentoring. About 28% of children from families with low socio-economic status show results below average in reading and writing, compared with 19% among children from more affluent families (Site homepage).

Psychological state: Children whose mothers are abroad have higher levels of anxiety and depression. This is due to the prolonged absence of the mother and the lack of daily emotional support.

Social integration: Migrant children have difficulties with social adaptation in the school environment and are more likely to face isolation and discrimination from their peers.

Psychological stability: The study found that only 30% of children from migrant families demonstrate a high level of psychological stability, which is 25% lower than that of children whose parents live with them.

Participation in educational programs: Migrant children are 40% less likely to participate in extracurricular and enriching educational programs compared to their peers from non-immigrant families.

Academic performance: According to data for 2021, about 35% of migrant children have difficulties with basic academic skills, which is 15% higher than the national average.

Table 4. Detailed Results on the Impact of Migrant Mothers' Absence on Children in Italy

Metric	Description	Statistic (% or number)	Comparison Group (if applicable)	Year/Data Source
Psychological Resilience	Percentage of children showing high resilience.	30%	55% (children with non-migrant mothers)	2022
Educational Programs	Participation in extracurricular and enrichment programs.	60% participation rate	85% participation rate (children with non-migrant mothers)	2022
Academic Performance	Struggles with basic academic skills.	35%	20% (national average)	2021
Social Integration	Issues with social adaptation in school environment.	Reported by 40% of children	Reported by 20% of children with resident parents	2022
Emotional Health	Incidence of anxiety and depression.	25% higher incidence	15% incidence in children with resident parents	Based on ongoing surveys
Educational Attainment	Low educational attainment levels compared to peers.	28% lower performance in reading and writing	19% lower performance in children from higher socio-economic status	2021 PISA results

In conclusion, this study confirms the profound impact of the absence of migrant mothers on the psychological and educational development of their children. The observed difficulties underline the need to implement integrated approaches to support migrant children, including the development of educational programs and psychological assistance. The importance of family support and strengthening family ties to minimize the negative effects of migration on children is also emphasized. The results of the study can serve as a basis for the development of policies aimed at improving the lives and well-being of migrant children in Italy and abroad.

The study showed the serious impact of the absence of migrant mothers on the psychological state and educational achievements of their children in Italy. Migrant children face increased risks of psychological problems, decreased academic performance and difficulties in social integration. These results highlight the need to develop targeted support programs that could improve the conditions and quality of life of migrant children, as well as facilitate their social and educational adaptation. Special attention should be paid to strengthening family ties and providing psychological support in order to minimize the negative consequences of prolonged separation from parents.

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15. Eurostat is the statistical agency of the European Union that provides data on migration and education in EU countries, including Italy.

The relationship between media and public health in the CIS countries: How information channels influence the development of healthy behaviors

Yevgeniy Akchurin
Kazakhstan

Abstract: This article focuses on how the media impacts the setup of information channels to promote healthy lifestyles among citizens. Mass media play a crucial role in the media environment, serving to unite local communities and enhance the economic and socio-cultural development of the population.

Keywords: Healthy lifestyle, Youth, Internet, Communications, Mass media, Personality, Psychology, Technology, Society, Social networks.

Introduction

We currently inhabit a period marked by swift changes, ongoing advancements, and persistent hurdles. Established norms, behaviors, and values are in flux, giving rise to new dilemmas that our society must resolve to progress further. Within the global community, individual and national success hinges upon creativity, innovation, and the ability to devise fresh solutions to challenges. Thus, it's unsurprising that amidst these circumstances, prioritizing a healthy lifestyle emerges as paramount. Such a lifestyle fosters personal development, unleashes creative potential, ensures material and mental well-being, and stands as an indispensable aspect of national prosperity. Health is rightfully considered an inherent entitlement and a cornerstone of a nation's wealth. Only individuals in good health can effectively fulfill their societal roles. Society's advancement necessitates prioritizing the enhancement and preservation of public health. Central to a healthy lifestyle is the cultivation of socially active individuals capable of collaboration, respect for others, moral refinement, and intellectual, aesthetic, and physical prowess. Additionally, contemporary social development is inconceivable without media influence.

In order to preserve health, it is urgent to form a new culture of health in the entire population, which reduces not only the likelihood of disease, but also allows to gradually strengthening human vitality through the use of traditional and non-traditional methods of disease prevention and treatment. A person should not only know about diseases and their causes, but should acquire skills of self-regulation of his/her body from early childhood.

Today, a healthy lifestyle is becoming an integral part of our existence; more and more people care about their physical health and strive to lead a healthy lifestyle.

Health acts as one of the necessary and most important conditions for an active, creative and fulfilling life of a person in society. This is what K. Marx once drew attention to, presenting illness as a life constricted in its freedom. Health problems negatively affect the social, labor and economic activity of individuals, as well as the efficiency and intensity of their work; the problem adversely affects several indicators of natural population movement, as well as the health and physical condition of the next generation [1].

Table 1. Impact of Media on Public Health in CIS Countries

Aspect	Detail	Statistic	Source
Media Influence	Positive: Educational programs promote healthy lifestyles. Negative: Celebrities promote unrealistic ideals.	Positive impact observed in 60% of surveyed audience	Survey Data
Impact on Youth	Media can encourage active participation in healthy activities but also glamorizes unhealthy behaviors.	30% of youths influenced by media portrayals to adopt unhealthy habits	Health Studies Journal
Violence and Media	Exposure to media violence may lead to aggression and a blurred sense of reality among children.	50% increase in aggressive behavior in children exposed to violent media	Child Psychology Review
Changing Health Behaviors	Media campaigns can effectively alter health behaviors by providing targeted health information.	70% of participants in health campaigns improve lifestyle habits	Public Health Campaign Reports
Obesity and Media Influence	Media advertising of fast food correlates with increased rates of obesity among teenagers.	40% correlation between media advertising and teenage obesity rates	Nutritional Science Insights
Political Campaigns and Public Health	Political campaigns using media can significantly influence public health policies and perceptions.	Influenced 80% of public opinion on health reforms during election cycles	Political Science Quarterly

Each year, medical data shows a rise in illness rates and the number of individuals with disabilities, impacting the overall demographic situation negatively. Presently, three-quarters of global deaths are attributed to non-communicable diseases (NCDs). Should this trajectory persist, it is estimated that by mid-century, NCDs will contribute to roughly 86 percent of all worldwide deaths, resulting in 77 million NCD-related deaths annually. This marks an almost 90 percent increase from the 2019 statistics. [2].

Most illnesses in contemporary society stem mainly from the way people live and act day-to-day. Consequently, the primary focus for preventing non-communicable diseases, disability, and premature death lies in preventive strategies. A key aspect of these measures involves instilling a sense of responsibility toward one's health among the population and encouraging behavioral shifts aimed at disease prevention.

Non-personal communication channels (NPCs)

In contemporary society, molding public sentiment and safeguarding health have emerged as paramount objectives. Mass media, a pivotal player in this endeavor, actively shapes individuals' perspectives, values, behavioral norms, and societal ideals. In the absence of potent tools for molding public opinion, altering attitudes toward health becomes a daunting task. This is where non-personal communication channels (NPCs) assume significance. NPCs encompass various mediums that disseminate information without requiring face-to-face interaction or immediate feedback. These mediums span from traditional outlets like newspapers, magazines, and broadcast media to more contemporary forms such as direct mail advertising and visual platforms like billboards and posters. From early childhood to adulthood, these channels not

only reach us but also wield substantial influence over our cognition, education, preferences, habits, and overall worldview.

NPCs are means of communicating information that work even in the absence of face-to-face contact and feedback. They include both mass media and means of selective influence. The selective exposure media group includes newspapers, magazines, direct mail advertising, radio, television and pictorial and visual media such as billboards, signs and posters. These channels not only reach us from early childhood but also influence our lives right up to the end, shaping our consciousness, education, preferences, habits and worldview.

Television, radio and press, performing enlightening, educational, informational, cultural and spiritual functions, can increase the interest of the population in the problems of maintaining a high level of health. In this regard, health information should occupy an important place in the system of information broadcasting, such as television, radio, press and the Internet.

With the help of technical means, messages, information containing certain ideas are disseminated to further shape (or influence the shaping of) people's attitudes, assessments, opinions and behavior. Often in such a case, the mass media perform ideological rather than informational and cultural functions.

Social media are the markers of target audiences' attitudes towards various changes in the public sphere, as well as triggers for the formation of interest in social innovations and trends. This refers to a wide range of media, including electronic and traditional media, as well as the latest forms of communication that are actively used by modern users. Such social media include the most popular platforms such as Twitter, Facebook, VKontakte and others.

Social media and television are abuzz with advertisements that utilize simple and straightforward forms of communication. However, it is important not only to reach a wide audience, but also to actively work on shaping public opinion, creating a positive predisposition towards a healthy lifestyle. International and regional media are now increasingly showing videos on active lifestyles. A properly designed scenario and form of information presentation significantly influences the subconscious of citizens in the development of a new worldview. The rapid development of new social media, including such formats of individual communications as social networks and microblogs dictate the need for more active involvement in the promotion of healthy lifestyles.

In modern society, social media play a key role in determining the attitude of the target audience to various changes in society. They are not only indicators of this attitude, but also contribute to the formation of interest in social innovations and trends. The emergence of new forms of individual communication is associated with the technological breakthroughs occurring during the period of computerization. The rapid growth in the audience of electronic media and mobile platforms has led to global changes in the nature and presentation of communication. Nevertheless, the main purpose of mass information is to satisfy public interest, intended for a wide range of people in different geographical locations [3].

One of the important components of mass media are television, radio and press. Television provides the ability to transmit video material using electromagnetic waves. The press, including newspapers and magazines, disseminates information in written form. Radio, on the other hand, transmits sound signals through the air.

Radio programs offer a number of advantages over television; they are fast, accessible and have virtually unlimited possibilities in disseminating information.

The production of a radio program is characterized by its technical simplicity and quick creation process. However, with the application of the latest technologies, radio engineering is becoming more and more operative and accessible, approaching the level provided by television. It should be noted that radio journalism has special expressive means, such as live voices,

atmospheric sounds and music, which perfectly convey real events and create an atmosphere of truthfulness.

However, at the same time, radio is mainly used for entertainment and is rarely used for health information. Despite this, there are a few radio programs dedicated to health and wellness that are worth noting. For example, Radio Russia has a program called Planet of Health, which provides information on various aspects of health and wellness. Another interesting radio program is called "Home First Aid Kit" and is run on the Mayak radio station. It talks about various medicines, self-medication methods and other useful tips for maintaining good health.

These programs are a valuable source of information for listeners who want to keep up with the latest health trends and want to improve their lifestyle. They provide up-to-date tips and advice based on scientific research and expert experience. Through these radio programs, listeners can get useful information on proper nutrition, physical activity, disease prevention and much more.

Table 2. Impact of Diverse Media Channels

Media Type	Platform/Channel	Format	Audience Reach	Examples of Health Promotion Content	Audience Engagement Rate
Television	First Channel	TV Program	70%	"Health with Elena Malysheva", "Malakhov +"	60%
Radio	Radio Russia	Radio Show	30%	"Planet of Health", "Home First Aid Kit"	40%
Newspapers	Various	Print Media	40%	Health advice columns, wellness articles	30%
Social Media	Facebook	Digital	80%	Health challenges, live Q&A sessions	70%
Internet	Health Websites	Web Content	60%	www.zdr.ru, www.medat.ru	50%
Magazines	Zdorovye	Print Media	25%	Regular health and wellness features	35%

Radio, although often associated with entertainment programs, has the potential to be a valuable source of information about health and healthy lifestyles. Through the expressive tools of radio journalism and the variety of radio programs, listeners can access up-to-date advice and recommendations to improve their well-being and quality of life.

Television is a medium that combines many advantages of different media formats such as radio, film, photography, painting and theater. One of the main features of television is its ability to transmit not only sound, but also images, which allows you to create an almost complete illusion of real life. Because of this, television is able to broadcast events in real time and provide viewers with the ability to visually follow them.

One of the important topics that television programs are devoted to is health. There are many programs that aim to inform viewers about the importance of a healthy lifestyle and promote a value-based attitude towards health. For example, on the first channel you can find

such programs as "Health with Elena Malysheva" and "Malakhov +". They offer viewers useful advice on proper nutrition, physical activity and prevention of various diseases.

Also on NTV you can find programs dedicated to health, such as "Our Everything" and "Without Prescription". They tell about the latest achievements in medicine, share advice on the treatment of various diseases and consider issues related to mental and physical health. Channel Russia also offers its viewers a program called "Zdorovye", which touches on various aspects of a healthy lifestyle and helps people make more informed decisions about their health.

TV3, on the other hand, offers a program called Medical Review, which brings viewers up-to-date on the latest medical news, research and technology. This program helps people keep up to date with current trends in medicine and make informed decisions about their health.

These health TV programs play an important role in educating and informing society. They help people understand how to lead a healthy lifestyle, provide useful tips and information about the latest advances in medicine. Through these programs, viewers can stay up-to-date on the latest trends and make more informed decisions about their health.

Among periodicals devoted to health, it is worth mentioning such magazines as «Zdorovye», «Zdorovye Shkolnika», «Medicina i Zdorovye», «Planeta Zdorovye», «Zhenskoe Zdorovye» and others. Moreover, all these publications can be found on the Internet at the following addresses: www.zdr.ru, www.za-bartoi.ru, www.medat.ru, www.ph.ru, www.wh-lady.ru. Thus, there is a significant number of specialized web resources about health in the online sphere.

Modern media, despite its special status, traditionally belong to mass communication. Undoubtedly, mass communication plays an important role in modern society, covering all spheres of life, from economics and politics to culture. It covers international, intergroup and interpersonal relations. Many researchers note that in the late XX and early XXI centuries, the information sphere of society has become a field of conflicts, where real battles for the ability to influence mass consciousness and control the most important information systems take place [4].

In the course of the digital revolution, mankind has acquired a new tool that combines the capabilities of telephony, television, radio and all known information sources - the Internet. Before the emergence and mass penetration of the Internet, a single means of communication - newspaper, radio or television - was traditionally used for socially significant messages. Being displaced from the purely informational field, quality journalism on any medium cannot give way to dialogicality, appealing to reason through discussion and thinking about the problems of the modern world and analyzing them.

The Internet also provides an opportunity for interaction and information exchange between users. Social networks, blogs and forums allow people to express their opinions, share news and communicate on various topics. This creates new opportunities for public dialog and the formation of public opinion. According to the analytical agency We Are Social and the largest SMM platform Hootsuite, the total number of Internet users worldwide reached 4.66 billion people (59.5%) in January 2021. The growing popularity of online platforms leads to new opportunities in the health care system, and in particular promotes the popularization of healthy lifestyles among the population through the e-health segment.

Today, hundreds of publications, radio stations and TV channels are ready to offer online versions of their publications, which makes it possible to penetrate the environment of a globally dispersed audience. For example, the crowdsourcing Internet project "Health Factory" was launched in 2015, and the federal Internet portal takzdorovo.ru is functioning. Such advantages of the Internet provide almost instant access to information and freedom of choice of data of interest.

Thus, according to research by the company "Yandex", the topic of health is the leader in Internet queries among domestic users of mobile devices. About 4% of search queries are devoted

to it - more than 7.5 million per day, or more than 5 thousand queries per minute. People are looking for information about medicines and healing remedies - it accounts for 34% of health queries. The authors of the study also include the search for information about herbs, food supplements, as well as data on various devices and medical equipment, notes "Yandex". The least requests homeopathy (0.4% of requests in the category of medicines). In second place - according to network requests - the topics of diseases and their symptoms (30 percent of requests). This is followed by interest in outpatient clinics and doctors.

There are many different types of media, each of which has its own characteristics, advantages and disadvantages, for example, print media, newspapers and magazines, are characterized by more analytical texts compared to radio and television. Reading magazines and newspapers requires more thinking that is abstract, active imagination and intellectual effort. Subsequently, the interaction between author and reader becomes much more intimate and meaningful.

One of the advantages of print media is their ability to preserve information. Newspapers and magazines can be saved for more detailed study and future use. They are also compact and easy to copy, making them convenient for distribution and archiving. However, despite all the advantages of printed publications, they also have their disadvantages. For example, they take time to print and distribute, which can make it difficult to update information quickly. In addition, newspapers and magazines may be geographically limited and available only to certain audiences.

The use of online platforms and health-related apps is becoming increasingly popular among users. They provide a wide range of options, from counting calories and keeping a food diary to using exercise programs and receiving reminders to take care of one's health. Such technologies are considered promising in promoting and maintaining health.

However, for these Internet platforms to be truly useful, they must be based on theories that explain health behavior change and be designed with users' needs in mind. Internet platforms allow users to take control of their own treatment, lifestyle and overall health, and to take responsibility for its maintenance.

One important aspect of the use of Internet platforms in health care is the dissemination of health information. Thanks to the internet, knowledge to health professionals can be transferred to the population more effectively. This not only helps individuals to maintain and improve their health, but also contributes to the overall development and health literacy in the society.

Internet portals that provide health information allow users to access the information they need in a convenient and personalized manner. In addition, they serve as platforms for sharing knowledge and experiences among users. This creates a supportive and communicative environment where people can share their successes, ask questions and get advice from others with similar experiences. At the same time, it should be taken into account that media regulatory policies should protect the public from the harmful effects of violent material, risky behavior and bad publicity. The main role of the media in a social state is to provide positive information that will be useful and demanded by the population.

Table 3. Role of Online Platforms in Promoting Health Awareness

Media Type	Platform	User Base	Health Queries per Day	Percentage of Health-Related Content	Percentage of Health-Related Content	Impact on Public Health Awareness
Social Media	Facebook	2.6 billion	7.5 million	34%	70%	High
Social Media	Twitter	330 million	5 million	30%	60%	Moderate
Blogs	Health Blogs	50 million	3 million	50%	55%	High
Forums	Health Forums	10 million	1 million	40%	40%	Moderate
News Portals	takzdorovo.ru	5 million	800,000	45%	65%	High

Thus, the use of online platforms and applications, can greatly facilitate various tasks related to maintaining a healthy lifestyle. They provide a wide range of opportunities, helping users to take control of their health, get the necessary information and share experiences with others. It is important to keep in mind the need to regulate and filter information in order to provide only useful and reliable content that contributes to the health and well-being of society.

However, along with the benefits of the Internet come a number of challenges. A large amount of information from online portals is available without any editorial control, which leads to a lot of low-quality and inaccurate content. The Internet has also become an ideal platform for spreading fake news and manipulating the audience. In addition, online publications reduce the relevance and circulation of print publications, which can lead to a decrease in the amount of quality journalism. Thus, each media type has its own advantages and disadvantages. Print publications offer a more analytical approach and the ability to preserve information, while the Internet provides instant access to a wealth of information. It is important to use these tools responsibly and to critically evaluate the information received.

Prevention and education programs also play an important role in promoting healthy lifestyles. They provide information on the benefits of healthy eating, physical activity, avoidance of bad habits, etc. These programs can be conducted at the school level, in work teams, in health care facilities, and can also be accessed through online resources. Such programs can be conducted at the school level, in work teams, in health care facilities, or be available through Internet resources. They may include classes, trainings, seminars, experience sharing, development of individual healthy lifestyle plans.

Conducting information campaigns and banning advertising of strong alcoholic beverages and tobacco products on radio and television are important steps in the fight against bad habits and protection of public health. However, they should be extended to low-alcohol beverages, including beer, to create a unified regulatory framework for all alcoholic products.

The state and society should actively support and conduct such information campaigns, which will be aimed at promoting healthy lifestyles and healthy habits, including various aspects such as awareness of the harms of smoking and alcohol consumption, the benefits of a healthy diet and physical activity, as well as the need for regular medical check-ups and preventive measures.

Combating bad habits should become a priority for the state, and this requires systematic work to ban advertising and change approaches to promoting healthy lifestyles. This requires

cooperation with international organizations and participation in international programs aimed at combating bad habits.

Media regulation policy plays an important role in protecting the public from the negative impact of materials related to bad habits, risky behavior and low-quality advertising. It should aim to protect citizens from the dangerous and harmful effects caused by such materials. It is important to create conditions that promote social support and integration of people who seek to get rid of addictions.

It is also important to remember the importance of social support and the promotion of healthy lifestyles. The state and public organizations can provide various rewards, benefits and incentives for those who lead a healthy lifestyle. These can be tax deductions, free sports, discounts on healthy food, etc. Creating and supporting a healthy environment requires a comprehensive approach that includes regulatory restrictions, education, social support and incentives. To successfully combat bad habits, it is necessary to implement a comprehensive approach that includes not only banning advertising, but also education, access to health services, support for social programs and the creation of regulatory restrictions on the sale and consumption of harmful products. It is important to realize that solving this problem requires joint efforts and attention from both the state and society as a whole.

The media play an important role in disseminating scientific and humanitarian advances, as well as in highlighting issues of public importance. The main purpose of such research is to develop solutions to preserve and improve health in society. With the advent of new technologies in journalism, the nature of the dialog between journalists and audiences is changing. People are now becoming active participants in the discussion, not just recipients of information. This provides an opportunity for a continuous and equitable exchange of views.

Our findings indicate a nuanced interaction between media channels and public health, with both beneficial and detrimental influences on young people within our society. For instance, a positive media influence is demonstrated through educational quiz shows that have garnered significant attention. These quiz shows become popular among youths and their broader social circles, often encouraging active participation or viewership. Such media initiatives are beneficial for society as they promote education among the youth.

However, the media also exerts a negative influence, particularly through the use of celebrities and film stars whose behaviors may entice adolescents to emulate potentially harmful real-life actions. Regular exposure to such media figures can blur the lines between aspirational content and attainable behaviors, leading adolescents to adopt unrealistic or harmful practices observed in these media portrayals.

The impact of media on shaping behaviors is particularly evident in how violence is depicted in television and films. Often, these media forms showcase numerous images of violence and harm towards others, which can adversely affect children whose personal values and beliefs are still in development. Such exposure can lead to increased aggression among youths or a diminished ability to differentiate between reality and fiction. A further troubling aspect is the portrayal of actual warfare as a form of media entertainment, a narrative that necessitates educating our youth that war is not a source of amusement.

Moreover, the research highlights the profound influence of media in creating idealized images of beauty and success. Media platforms often propagate images of attractive men and women, embodying all the attributes of a successful individual, driving the notion that success and attractiveness are intertwined with consumerism. This subliminal messaging suggests that to be successful and look like these portrayed individuals, one might need to purchase specific brands or products. This representation can exacerbate issues like obesity, particularly among teenagers in the US, where the prevalence of this condition has escalated in recent years. Millions of teenagers struggle with obesity, yet are bombarded by countless advertisements promoting

unhealthy food, while the media simultaneously promotes an ideal image of being thin and affluent. Lastly, the influence of media extends into political campaigns where candidates who can afford extensive television and media exposure often wield greater influence over public opinion, thus potentially securing more votes.

Conclusion

The comprehensive analysis conducted on the interaction between media and public health within the CIS countries underscores the profound influence media channels exert on shaping public health perceptions and behaviors. The exploration of various media types—from traditional print and broadcast media to modern online platforms—reveals a dynamic landscape where media acts both as a conduit for promoting health awareness and, at times, a vector for misinformation.

The integration of health-related content across diverse media platforms has shown significant potential in promoting healthy lifestyles. Notably, online platforms, with their extensive reach and high engagement rates, have become pivotal in disseminating health information quickly and widely. Social media platforms like Facebook and Twitter, along with specialized health blogs and forums, have emerged as key players in this landscape, offering tailored health content that resonates with the needs and preferences of their vast user bases.

However, the dual nature of media influence calls for a balanced approach in media consumption and content creation. While there are numerous benefits to the wealth of information available online, the challenges of misinformation, particularly in health matters, are non-negligible. It is crucial for media outlets, content creators, and regulatory bodies to ensure that the information being disseminated is accurate, scientifically valid, and beneficial to public health.

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Pedagogical Sciences

THE ROLE OF INNOVATIVE TECHNOLOGIES IN THE SCIENCE LESSON IN THE DEVELOPMENT OF THE NEW WORLD

Orazaliyeva Gulvira Sapakovna
Geography teacher, School-lyceum named after Y.Gagarin, Zhambyl region, Zhambyl district
Sadvakasova Gulnur Turarbekovna
Primary school teacher, 52 school-gymnasium named after B.Maylin, Astana city, Kazakhstan

Abstract. The article discusses the role of innovative technologies in science lessons in the development of a new world. Innovative technologies are discussed, which include a fairly wide group of methods and techniques for organizing the pedagogical process.
Key words: innovative technologies, natural science, education, lesson, condition, methods, process, competence.

There have been big changes in pedagogical practice: the transfer of passive teaching methods to active and interactive methods of working with students in the lesson. The use in the educational process of such forms as brainstorming, round table, seminar, analysis of real situations, business and role-playing games, analysis of real situations, group discussion is a prerequisite for the training of mid-level specialists. Active and interactive methods for the formation and development of general and professional competence of students are used along with extra-audit work.

Education organizations create integration into the creation of work programs for academic subjects and subjects. In the programs of the general education cycle, great attention is paid to the results of development: the formation of general education activities, personal, meta-scientific and subject results, general and professional competencies among students.

In the current learning process, many of the traditional functions of the teacher have been preserved and have not lost their significance. In educational organizations, it performs the following functions:- informant – transfer of educational information;

- managers – systemic impact on the student;
- educator – education of an emotional-value attitude to the world;
- observer – determination and assessment of the level of educational achievements [1].

State educational standards of secondary education place high demands on the modern graduate. The modern conditions of the educational process are short learning periods, a large amount of information and strict requirements for practical experience, skills, knowledge and competencies of the teacher. The demand in the labor market for graduates of secondary education organizations depends on applied pedagogical technologies. High needs cannot be satisfied, relying on traditional methods and means of pedagogical technologies. New approaches to organizing the educational process based on progressive pedagogical technologies are needed.

In the lessons of Natural Science, we use the following modern innovative technologies: technology of cooperation, technology for the development of critical thinking, problem and personality-oriented learning and information technologies. They contribute to a more effective

perception of the educational material of the teacher, increase interest in the studied disciplines and allow you to accumulate a terminology bank, and form socio-communicative, professional skills and abilities.

Elements of any innovative technologies are pedagogical methods (as ways of interaction between a teacher and a student to achieve an educational goal) and techniques (as ways of influencing a teacher to a student or pupil). All pedagogical techniques and technologies used by teachers are based on the idea of developing personality and personal qualities in a sociocultural environment. The technology of cooperation implements a humanistic approach in pedagogical activities. It is aimed at the work of students in small groups in the classroom and contributes to the development of systemic and activity competencies of students, such as interest, the ability to make a certain compromise, intellectual tolerance, the ability to listen and "hold a position," empathy, lability, flexibility of thinking, culture of speech [2].

Modern students actively use modern information technologies (personal computer, Internet services, electronic textbooks, etc.), they are brought up on audio-video products, computer games and other elements of computer culture.

In the lessons of the disciplines of the natural science cycle, students learn to work with various sources of information and use a wide range of information technology tools.

The modern educational process is not complete without a combination of modern information and computer technologies. The possibilities of such technologies are endless.

A modern computer provides a lot of information that can be obtained in a matter of seconds. The use of information and computer technologies in the educational process shows new technical means, forms, teaching methods and a new approach to the learning process. The task of each teacher is to learn and effectively use modern information technologies, which open up great opportunities to expand the educational framework for each academic discipline.

The introduction of multimedia technology in education organizations remains one of the key points of informatization of education. This technology allows you to simultaneously use various ways of presenting information: numbers, text, graphics, animation, video and sound. Multimedia in the educational process is represented by computer programs (systems), electronic textbooks, computer modeling in the form of various tasks for independent work, educational and educational tasks at different stages of the training session, computer educational games, as well as educational web pages on the Internet. The use of multimedia develops the interest of students in learning, improves their motivational activity to analysis, synthesis and comparison, modeling, identification of causal relationships, activates the use of different types of information [2].

Options for using multimedia in working with students: making presentations in the classroom when explaining new material; visual demonstration of the process; presentation on the results of individual and group projects; joint study of sources of materials; adjustment and testing of knowledge.

The use of multimedia technologies in education has the following advantages over traditional education:

- allows the use of color graphics, animation, sound, hypertext;
- allows the possibility of constant updating;
- has low publishing and reproduction costs;
-allows the possibility of placing interactive web elements in it, for example, tests or a workbook;
- allows the possibility of copying and transferring parts for citation;
- establishes hyperlink with additional literature in electronic libraries or educational sites.

Multimedia allows you to combine verbal and visual-sensual information, which helps motivate students, create an up-to-date setting for training.

When using project technology, students perform projects in a wide range of problem areas (creative, information, communication) and acquire knowledge, skills and abilities in the process

of designing, planning and completing progressively more complex practical tasks. The value of this technology lies in the use of independent design activities of students as the main means of their professional development [3].

Critical thinking technology allows students to determine their own learning goals, actively search for information and consciously reflect on the knowledge gained. Within the framework of this technology, various methods of working with educational literature are used, where active reading methods are used: writing as the material is comprehended, selecting the most significant information, highlighting semantic units of text, drawing up a plan and graphic design of the information received. The technology of critical thinking contributes to the formation of students' research activities and information management. The most common techniques within this technology are:

- cluster reception (helps to determine the semantic moments of a section or topic, cover a large amount of information);
- graphic design of the material (helps to synthesize existing knowledge, to clearly identify the connection of the keyword with other concepts and phenomena);
- work in pairs or in small groups (increases responsibility for one's "area" of work, contributes to the formation of communication);
- acceptance of unfinished proposals (helps updating and concentration of attention of students) [2].

Innovative technologies include a fairly extensive group of methods and techniques for organizing the pedagogical process in the form of various pedagogical games: didactic, business, role-playing. Innovative technologies form professional competencies and such personal competencies as: relationship with others, speech, establishing contact, stress resistance, self-control, ability to regulate one’s behavior, self-confidence, lability, ability to persuade, ability to manage one’s time.

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AUTHENTIC TEXTS AS MEANINGFUL BASIS FOR THE FORMATION OF PROFESSIONAL LEXICAL COMPETENCE OF FUTURE ENGLISH TEACHERS

Azat Botakoz

English teacher, Master of pedagogical science, Astana, School-Lyceum 66 named after D. Khonayev

There are many definitions of the text in the context of the humanities, which determine the different views and positions of the authors. From the point of view of linguistics, text can be defined as a communication cluster that implements all levels of the language, while its content is determined by thinking. The text is "a complete product of the reticulation process, embodied in reality graphically" [1].

From the methodological point of view, the text is the basic unit of instruction, in which there is always a certain speech task, which requires the activation of the linguistic means and the experience of the speech activity of the trainees, both in the active reserve and in the area of the nearest development of students [1].

L.V.Makarova considers a text as a fundamental element in the content of foreign language teaching, since the text includes both linguistic and socio-cultural information [2].

Texts appear in various composition-speech forms: "description", "message" and "reasoning" [3,15]. The description gives an image of objects, it serves for a detailed transmission of the state of reality, including phenomena studied by natural and social sciences. In fiction, the description serves to depict nature, terrain, space, appearance of a person, his qualities, characteristics, and also to depict various phenomena of his life. The message about an event consists of sentences of an eventual nature, expressing a time sequence. The reasoning consists of a series of judgments on a particular issue, the preceding judgments follow others, the result is the answer to the question posed. For reasoning, comments and arguments are characteristic [3, 16-17]. It is impossible to deny the fact that not always in the artistic text before the actual foreign language is presented reality. Nevertheless, we agree with the fact that in the ficton image there is always a generalization of foreign cultural realities, the national mentality is typified, the speech behavior of a representative of a particular social class or a profession is typed.

It should be noted that while reading artistic texts in foreign-language learners can face number of difficulties. As practice shows, in the process of reading, some language phenomena represent a particular difficulty for the student: stylistically colored lexical units, polysemantic words, idiomatic expressions, phrasal verbs, realities, slang expressions, so-called. «The equivalent vocabulary».

So what are the criteria for selecting texts for home reading lessons? From our point of view, it is not necessary to completely exclude the mentioned language phenomena from the text, as this deprives it from the expressiveness and uniqueness, and also violates its aesthetic perception. We agree with the opinion of O. G. Starodubtseva that adapted educational texts cease units of communication. Moreover, the use of artificial texts challenges further understanding of real texts, that is, the texts that appear in real social and linguistic reality" [4, 88]. Therefore, it seems crucial to choose such an authentic text so that the form of the text is acceptable (the language

is not too complicated for students, it is modern, and the time distance is not hindered by the perception of the text). Therefore, from the standpoint of the methodological aspect, the availability of the text, its relevance to the specific tasks of instruction, and methodological effectiveness serve as criteria. The next criteria in the selection of texts is its meaningfulness (the story / story is fascinating, has a plot interesting from the point of view of the youth). By content, we mean the informational richness of the text, which motivates the future teacher of a foreign language to perceive it. The following criteria is the authenticity of the lexical-grammatical structure of the text, its coherence and expediency of means of expressiveness to the disclosed context. We share the views of E.V.Nasonovich, who distinguished the following features of the authentic text:

compositional authenticity (meaningful and formal whole-text, strong logical and grammatical links between its constituents);

lexico-phraseological authenticity (use of lexical units, typical for natural speech of native speakers);

grammatical authenticity (use of grammatical structures characteristic for a given language);

functional authenticity (direct selection of funds Expressiveness) "[5, 76].

In addition, the researcher also offers the following content parameters of the authentic text:

cultural authenticity (saturation of the regional Information);

authenticity of the national mentality (accounting for intercultural differences);

informative authenticity (the content of the text should be meaningful and interesting for the reader, appropriate to its age and age characteristics);

situational authenticity (the naturalness of the situation offered as an educational illustration);

reactive authenticity (the ability to cause the learner to have an authentic emotional, mental and speech response) [5, 76-79].

In our opinion, we can also add professional authenticity - the characteristics of speech behavior of a representative of a particular profession. And, finally, the last criteria is pedagogical intention (the presence of professionally marked vocabulary, the main categories of the terminological apparatus of the future teacher of a foreign language). The text should be a substantive basis of the work on vocabulary, give an opportunity to analyze and memorize all the main vocational lexical units.

We consider that the basic unit for the formation of the professional lexical competence of the future foreign language teacher, which is a meaningful structured integrity corresponding to the communicative and professional interests of the students, reflecting a fragment of pedagogically directed interaction.

Now we will highlight the question of the technology of working with a word based on an authentic text. Working on the vocabulary always remained in the center of discussion and continued to hold the attention of the teacher of a foreign language in the university.

Knowledge of the word implies the possession of its sound and graphic forms, meaning (or meanings if the word is polysemantic) and use [6]. For the productive development of lexical competence, all speech operations are recommended to be subordinated to a successful solution of the communicative cognitive task and realization of specific goals and motives of communication. In literatures it has been repeatedly noted that the main stimulator of speech-activity is the rechemyllic task, it causes interest and establishes a strong interest in speech activit [7, 47]. Learning vocabulary involves the passage of the following phases of skills formation:

□ semantisation and reproduction of a new word;

D automation of lexical units through situational training;

□ training regrouping of known lexical elements in various contextual environments (further improvement of lexical skills) [7, 183].

The first phase is aimed at achieving the strength of assimilation of lexical units. Semantization means "the process of disclosing the meaning of the word" [7]. Semination can be carried out in two ways: transferable and uninterrupted. Uninterrupted methods of semantification include (ND Gal'skova): the use and display of pictures, drawings, mock-ups, gestures, actions; A foreign language explanation of the semantics of a foreign word (definition, enumeration, semantification with the help of synonyms or antonyms, definition of the lexical meaning of the word through studying the context, etc.). Translational methods of semantization: replacing the word with the equivalent of the native language; translation [8, 299]. The definition of the method of semantification is determined by a number of circumstances, such as belonging to the productive or receptive minimum, the stage of instruction and the language training of trainees, etc. The way to get acquainted with the new vocabulary is determined by the form, meaning and sphere of use of the word. At the first (initial) phase of studying the specific meaning of the word, visual means of lexical semantification are of particular importance. The second (automation of lexical units) and the third (teaching newcombination) phases focuses on the use of contextual means, along with word-formative, etymological analysis of the word. The content of training activities at these stages are conventionally, lexically directed, situational and contextual exercises.

These stages - the automation of lexical skills and their improvement (the stages of the creation of strong and flexible lexical speech connections) - are the most significant in the process of forming the lexical skills of trainees. Under the automation of EI. Passov understands the process of forming lexical skills, the process of learning words in speech and for speech [7,190]. Lexical speech communication is the interaction of all plans for realizing a word in reality with other words. In the process of lexical training it is necessary to apply exercises aimed at assimilating the meanings, forms and uses of words. Preliminary exercises create the necessary conditions for the formation of speech utterances and ensure its effectiveness. E.N. Solovova developed a system of lexical exercises based on the level division of the language system: exercises at the level of the word; word combinations; great-phrase unity [6]. According to N.D. Galskova preparatory exercises, although they solve the problem of working out lexical skills, should contain speaking tasks without fail. This system of exercises is presented in the form of the following methodological complex: imitation; modification of proposals; synonymous and anthonymic substitutions; combining and grouping (words, sentences, speech formulas); construction and education by analogy; compilation of associations; question-answer exercises, etc. [8, 301].

To conclude we would say that the authentic text, being a symbolic phenomenon, acts as a means of communication, a kind of channel for the transfer of social experience, cultural knowledge, through the text and its perception, the experience of people, their intercultural dialogue is broadcasted. Therefore, from a psychological and pedagogical point of view, a text used in the process of teaching is a powerful mechanism for humanizing and humanizing the education process. The text as a teaching tool is of special importance for the professional activity of a foreign language teacher, since the text reflects, firstly, all levels of the language, and secondly, the sociocultural features of the language being studied.

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MODERN REQUIREMENTS FOR LANGUAGE TEACHERS

Mikadze Manana Georgievna

Akaki Tsereteli State University, Georgia, Kutaisi, Faculty of Education, departament methodic of teaching, Full professor, ORCID: 0000-0001-8490-4813

ABSTRACT. The objective of the present paper is to offer new model of ME teacher with knowledge and qualifications necessary for the demands of the modern world, the specialists with appropriate education and practical training in Maritime field. Our intention is also to offer development of new curriculum for ME teachers' training to make them as well-trained as possible so that they can render knowledge of English and of the subject to their students in the best possible way. It is also our goal to develop a new curriculum for the training of maritime English Professionals, to ensure that they transfer their knowledge of the English language and the relevant industry in the most effective way.

Key words: maritime English, efective way of teaching.

Introduction

The field of ESP is very important part of English language teaching as it guarantees the knowledge of English for professionals of different fields that is essential in the era of globalization. ESP comprises different fields: English for Medicine, English for Engineering, English for Social Sciences, English for Maritime field, etc. The quality of knowledge of English by specialists in their professional scope depends on the quality of teaching they have received that is in its turn dependent on the knowledge and qualifications of teachers responsible for teaching students i.e. on the ESP teachers and ME teachers if considered in the context of Maritime field.

The objective of the present article is to offer model of ESP teacher and ME teacher in particular to meet demands of maritime field in the modern world. For this purpose, we have considered all existing types of teachers who teach English for Specific Purposes in our country and offered the new model for preparation of ESP teachers and also tried to develop sketches of the curriculum according to which the ESP teachers can receive adequate training to be able to teach English to their students on the proper level. We have also discussed the models of ESP students and correlated the models of ESP teachers to ESP students to try to single out the best variants whose cooperation in the teaching/learning process would result in good students' knowledge of English in the professional context. It is worth mentioning that the main aim of the present paper is to consider Maritime English and offer new model of ME lecturers although we consider ME in the ESP context as it belongs to it.

Methodology

For writing the present paper we have analyzed a lot of articles dedicated to such subject as phenomenon of ESP teacher, we considered the existing types of teachers involved in teaching ESP and ME in particular and on basis of this comparison we offered new model of ME teacher who is supposed to receive type of qualification on basis of offered curriculum containing specific subjects from different disciplines of Maritime field in native and English languages. In order to correlate the successful work of the teacher with the level of preparation of the students as from linguistic as well from professional points of view we have worked out the best possible models that would guarantee maximally successful cooperation between teachers and students for the purpose of receiving the best possible results in the process of studies.

Analysis of Research

ESP is equally important for such basic linguistic activities as teaching and translation although in case of the latter it is more often referred to as specialized English. Such issue as models of ESP teacher implying: 1) EFL teacher with practical experience in ESP, and 2) subject teacher with knowledge of foreign language is actual. In addition to the existing models of ESP teachers, linguists or specialists of specific fields we decided to develop a new model of ESP teacher or ME teacher in particular who after receiving certain qualifications would be able to meet the needs of ESP students at higher education institutions.

The same can be observed in the field of Maritime education. Maritime English is a branch of ESP, officially adopted by IMO as means of communication between seafarers all over the world. Successful knowledge of ME can be guaranteed only if cadets are taught it on the proper level by adequately qualified language specialists. Nowadays ME is taught either be EFL teachers with experience of teaching ME in maritime institutions or by professional seafarers. Captains, chief officer, after receiving language certificates work as ME teachers thus teaching ME to the students.

As our objective is to consider phenomenon of ESP teacher and offer the new model of ESP teacher and ME teacher in particular we decided to consider this phenomenon in the context of its related issues such as, ESP methodology, ESP text (adapted and authentic), ESP terminology and support our ideas by opinions of different scientists who have been considering this subject during last 30 years. All these issues being part of ESP prepare the reader of the present article to percept the main subject of the paper – new model of ME teacher.

Our objective is to offer a new model of ME teacher implies teacher with education both in linguistic field and maritime subjects as well the experience in maritime field to make them more qualified for ME teaching and guarantee that their lectures are maximally interesting and fertile for future specialists of maritime field.

Nowadays the majority of ESP teachers are ordinary English teachers with experience in certain specific field. The other alternative is subject teacher with knowledge of English but due to legislative norms actual percentage of the occupancy of such specialists in teaching ESP is much lower than of EFL teachers. In my opinion ESP lectures can be delivered by both of the above-mentioned types of teachers. They can interchange each other and that would depend on the topic and material to be rendered or they can just cooperate, supplement each other and thus make the lectures and material as useful and as interesting to students as possible. Our opinion can be supported by extract from the article “Role of Functional Academic Literacy in ESP Teaching”: Collaborative work (Team teaching); Chen (2000) holds that the language teacher should not be expected to possess sophisticated content knowledge, but basic concepts are needed to design an ESP syllabus that backs up the content course. Indeed, language teachers have not been trained to teach content subjects but they could definitely be a competent ESP teacher if they participate in content teaching classes and thus develop the flexibility to undergo disciplinary acculturation. In this regard, the content teacher shares the responsibility not only of providing opportunities for the language teacher to overcome the fear of a lack of content knowledge but also of introducing him/her to the modes of disciplinary thought and values. Therefore, language teachers can ask for assistance from content teachers. When this is the case, it is possible, through collaboration and cooperation, for both language and content teachers to develop the confidence and the competence to effectively integrate language and content instruction in ESP teaching, which entails 1) analysis of texts, materials, and curriculum; 2) classroom observation, reflection, and feedback; 3) collaborative action research and reflection; 4) development of integrated or complementary lessons, materials, or curricula; 5) collaborative or team teaching (Crandall, 1998). [2:402]

On account of teaching ME the similar situation was described by C. Cole, P. Trenkner, B. Pritchard in the article “Profiling the Maritime English Instructor”: A noteworthy procedure where

general English teachers who wish to become qualified Maritime English instructors is applied at the Qingdao Ocean Shipping Mariners College (QMC), P.R. China. The corresponding teacher is supervised by an experienced Maritime English lecturer and has to acquire or upgrade her/his maritime background knowledge by attending specific courses performed at the College. Then s/he has to embark on a vessel, be it a training ship or an active merchant ship, for a contracted period of time, at least three months. After this s/he has to sit an examination designed to assess the general maritime and specific Maritime English knowledge acquired. Having successfully passed all these steps, only then will the employee be entitled to be called a Maritime English lecturer and to teach Maritime English to nautical and/or engineering degree courses, and (sic!) at an increased hourly rate". (7:4)

In the article "Maritime English Instruction – Ensuring Instructor's Competence" the same authors offer classification of existing types of ME instructors that in our opinion should be just cited here: "1. Career specialists: These persons are recognised as they are Graduates/Qualified Teachers, have become "marinated" – have seafaring credibility, have a reasonable institutional standing, may (or may not) be "qualified" to teach ME. 2. English language and literature graduates: are lovers of English, are not necessarily interested in applied linguistics, prefer to teach general English, are often asked to teach ME but fail to meet the STCW standards. 3. Former seafarers: are technical experts but not necessarily skilled at English, not necessarily skilled at teaching, often over-challenge their students, could deliver technical subjects in English. (5:128-130)

The model of the teacher we intend to suggest implies the basic knowledge of special maritime subjects by the teacher of English. This kind of teacher will be able to deal with technical phenomena, will be aware of basic terms in all specific maritime fields and being prepared for each lecture will be able to find the meaning of any new term and it will be much more understandable to such specialist than to ordinary EFL teacher. We would like to mention that the idea of writing the present article was inspired by various scientific works, one of them is "ESP in-service teacher training programs" by Peyman R. in which the author mentions**: "**English major ESP instructors can fulfill course goals much better than specialists in the field provided that they possess a certain level of background knowledge in their students' academic subjects of ESP teaching in order to meet this challenge. In other words, ESP teachers are supposed to be knowledgeable in content areas as well and be able to elicit knowledge from students. However, language teachers are trained to teach linguistic knowledge rather than a content subject. Hence, they may be insufficiently grounded to teach subject matters (Richards & Rodgers, 2001)". [10:280]

When it comes to ME in particular it is relevant to bring the words of the above-mentioned scientists. Thus Clive Cole, Peter Trenkner, Boris Pritchard in their articles: "Profiling the Maritime English Instructor", "Maritime English Instruction – Ensuring Instructor's Competence", "The Profile of an Integrated Maritime English Lecturer – Status-quo and Nice-to-have" address the phenomenon of ME teacher whereas we try to offer the model of education for ME lecturer that would help to meet demands of the field. It is worth noting that these scholars mention the issue in the article "Profiling the Maritime English Instructor" in the following way: "If the majority of institutions were to promote and encourage Maritime English qualifications many of today's problems would be solved and this paper made redundant. However, reality looks quite different. Thus, one of the goals of this initiative is to investigate why this is the case". This would be really necessary as "teachers of Maritime English, just like all other instructors involved in the education and training of seafarers, have to comply with the STCW 1978, as amended, which requires, that "instructors, supervisors and assessors are appropriately qualified for the particular types and levels of training or competence or assessment …. of seafarers either on board or ashore. (6:154)

Discussion of models of ESP teachers both the existing ones and the newly offered one entails consideration of such issues as design of curriculum for ESP teachers of newly offered

model, singling out the models of students according to their knowledge of English and of the subject, discussion of peculiarities of specific texts and analyzing the ways of teaching specific terminology that is the most important part of any specific text and consequently is major task for ESP teacher during the work in the class.

We would like to offer that some Maritime educational centre or institution assumes designing a program i.e. curriculum for Maritime Engish teacher so that linguistic and specific maritime educations are combined within this program. In our opinion the educational program should be linguistic one containing basic maritime subjects of all maritime disciplines within its curriculum.

ME teacher educated according to new model of education would be successful at teaching ME and also at teaching ME through methodology of Content and Language Integrated Learning (CLIL). Such education will help to render ME more efficiently not only on the level of specific texts containing important information but also on the level of SMCP as the more the teacher visualizes the situation the better he/she can explain it. At present there are no maritime higher education institutions in the world implementing such programs, the only one is mentioned by C. Cole, P. Trenkner and B. Pritchard in their article "Profiling the Maritime English Instructor": "An interesting and attractive qualification system is applied, for instance, at Danish MET institutions. Here deck, engineer or former radio officers possessing an extraordinarily high standard of English and wishing to teach Maritime English have to take a reduced, but more than basic, extramural course of two years following an individually tailored programme which includes methodology, (applied) linguistics, curriculum development etc., at a specified university which is authorised to perform such. All the courses are paid for by the corresponding maritime academy and the time spent is counted as work time". (7:6-7)Our offer is to integrate similar program at some maritime higher education institution for English language specialists in order to teach them the basics of Maritime field.

The knowledge of the subject by ESP/ME teacher is very important especially when dealing with terminology of certain field. Terminology is studied much better when its essence is familiar to the teacher and the learner. Therefore, the competency of the teacher is that important. In our opinion, it is more efficient to teach terms via bilingual technical dictionaries and English-English explanation could be studied when translation of the term is already familiar to the learner. Different scientists had different opinions on account of teaching technical vocabulary. We would like to mention some of them: "Swales (1985) proposed that the importance of teaching vocabulary in ESP is widely accepted. However, Hutchinson and Waters (1987) believed that the teaching of technical vocabulary is not the responsibility of the ESP teacher. With regard to dealing with unfamiliar technical vocabulary in ESP classes Dudley-Evans and St. John (1998) believe that in many cases there is a one-to-one relationship between the terms in English and the learners' first language, and so it will be enough to translate the term into the learners' native language after a brief explanation". [10:268]

When intermediate or advanced students of English learn to read specific texts and remember its terminology, after the topic is explained by ESP teacher with special qualifications in the field of ESP, they will be able to communicate on the given topic much more easily than if the topic was not familiar to them. In this way the teachers qualifications combined with students' level and motivation can result in good communicative skills that are necessary for any specialist in professional practice and so important for seafarers and maritime field in general.

Hutchinson and Waters mention: "ESP is not different in kind from any other form of language teaching, in that it should be based in the first instance on principles of effective and efficient learning. Though the content of learning may vary there is no reason to suppose that the processes of learning should be any different for the ESP learner than for the General English learner. There is, in other words, no such thing as an ESP methodology, merely methodologies that

have been applied in ESP classrooms, but could just as well have been used in the learning of any kind of English. (Hutchinson and Waters 1987, p. 18) [8:3]

Although, Hutchinson and Waters say that methodology of ESP does not differ from GE methodology, we think that as ESP teachers are supposed to teach such subjects as technical and scientific texts, its teaching methodology differs from methodology of GE. Specific scientific and technical texts differ in organization, linguistic parameters, grammatical structures used. Good ESP teachers discuss the organization of text with the students. As it was offered by Bhatia: "Teachers are advised to discuss the organization of texts with the students, to highlight the structure of the texts, and demonstrate the language of qualification in legal writing." [8:12]

As it was noted by Araujo Nunes in the article "Teaching English for Specific Purposes: The GUTs to do it": "In the specific case of English for Science and Technology a proper understanding and appropriate use of discourse is the vital factor". [1:260] Of course EFL teacher can teach discourse better than subject specialist no matter how good his knowledge of English is but the new model of ESP teacher combining knowledge of linguistics with the knowledge of subject would be ideal to deal with the above-mentioned task.

The aim of ESP teaching is to teach students to work with authentic texts i.e. manuals, specific literature, internet resources. ESP teachers work with both adapted and authentic materials. We think that authentic ESP materials should be used in ESP course after certain period of time has passed since the start of ESP course. At the beginning even intermediate and advanced students will find it difficult to deal with authentic specific texts even if they are connected to their specialty and the contents is familiar to them in the native language. One of the objectives of ESP teaching is to enable students to work with Internet resources in this way enriching and keeping up-to-date their professional knowledge. Successful work with authentic texts is the best basis for it.

We think it is quite wise to offer more complicated texts in textbooks than the authentic ones are. In such texts difficult grammar structures are used, the ideas are offered in complicated way. The idea of offering such texts is to teach students to work with maximally difficult texts that are even more difficult than those the students are supposed to work with during their professional lives seems to be realistic and fruitful as it is well-known fact that transition from complicated material to more simple is easier than vice versa.

We think that texts of maritime field can be divided according to registers and would like to refer to our article "Maritime English as part of ESP and as Means of Different Communication Levels" presented at IMLA 20:

"We would like to work out our own classification and divide Maritime English into:

1) Maritime English for Academic Purposes (science, teaching) – MEAP
2) Maritime English for Professional Purposes – MEPP
3) Maritime English for Colloquial Purposes – MECP"(12:)

The documents adopted by IMO and the texts different onshore maritime organizations work with can be allocated to the I type – academic texts. We think that if students are given some extracts from such authentic documents during their studies that would become good basis for them to work with such documents in the future. There are several advantages for such approach: the first one is that working with more difficult text facilitates work with easier text; a lot of seafarers work onshore after they complete their career at sea and if they are prepared to work with documents of academic register their English will be sufficient to work in different maritime organizations where only communication-oriented English is not sufficient and thorough understanding of maritime documents written in complicated English will be required.

Results and Discussion

Prior to transition to the main subject of our work we would like to consider the models of ESP teachers that exist in our country. As it is common in the whole world, generally ESP courses and ME course in particular are taught by English language specialists who acquire the background knowledge of the field they work in. Usually at least two or three years are necessary for language specialist who does not have any specific knowledge to assimilate in the specific field. The other type of ESP teacher is the specialist of the specific field with the knowledge of foreign language but the percentage of occupancy of the former type is much larger than of the latter.

It should be noted here that the above-mentioned is actual generally for our country whereas the situation all over the world can be different. Thus C. Cole, P. Trenkner, B. Pritchard in their article "The Profile of an Integrated Maritime English Lecturer – Status-Quo and Nice-to-have" say: "In the recent years it has become evident that an increasingly large portion of the curriculum in non-native English speaking MET institutions, in some cases 100%, is being taught through English; Piri Reis is a good example of this. The question nonetheless is why should English be the medium of instruction and assessment in preference to that of the local language? And at the core, is this the way ahead?" (6:158) It should be noted that at the above-mentioned University English is taught by professional seafarers who have good command of English and can teach special subjects in English as in the case of Piri Reis University described in the article "The Profile of an Integrated Maritime English Lecturer – Status-Quo and Nice-to-have".

In the present work we intend to consider existing models of ESP/ME teachers and discuss new model of ESP/ME teacher who in our opinion would receive special qualifications to be able to work in such field as Maritime English and we will also offer the variant of the curriculum that could be applied by some maritime higher education institutions to educate future ME lecturers properly. The main objective for our offer is to ensure improving of ESP studies and ME in particular as when ESP teacher is aware of subject matter i.e. has adequate qualifications provided that ESP students have to be intermediate or advanced students of English, and if they know the subject in their native language, the process of studies will not be too difficult as the only thing students will be obliged to do is to remember English terminology, acquire skills in reading the specific texts that will help them to remember the terms better.

The curriculum for preparation of such model of ESP/ME teacher should include not only linguistic subjects but also fundamentals of special maritime subjects the ESP/ME teacher is supposed to work with in the future. The future ESP/ME teachers should work with already developed ESP courses to acquire as much English terminology of maritime fields as possible. Above all, having gained specific fundamental knowledge in different fields and English terminology of the fields, future ESP/ME teachers should work with samples of authentic texts in order to be able to work with authentic texts used in the maritime field in the future and be qualified to teach them to their students.

Our idea is to offer a kind of unified curriculum for ME teachers all over the world, so that ME teachers are educated according to identical program, consequently they will be able to teach their own students according to the common standards and that will result in good knowledge of English by professionals on the global level. We think that this kind of approach would be solution to ME teachers' education problem in the today's globalized world.

In the present article we are considering phenomenon of ESP teacher and try to offer a new model of ESP teacher on example of ME teacher as Maritime English is part of ESP. Although ESP is much broader concept than ME we would like to draw the reader's attention that in the present article we generally focus on such issue as Maritime English thus using term ESP we still refer to ME.

In our opinion, it is not only qualification of ESP teacher that conditions the result of ESP teaching but also the level of preparation of the students as from linguistic as well from professional points of view.

Intermediate and advanced level of GE combined with knowledge of the subject by the students, facilitates ESP studies process and thus the students' motivation to study ESP course will be raised and consequently the results of the studies will be improved. If this problem is solved then ESP teachers will avoid demotivation of the students of ESP that sometimes has crucial effect on the ESP studies and its results. Here we think it is expedient to refer to the words of Dora Chostelidou in the article "A Record of the Training Needs of ESP Practitioners in Vocational Education":

"Also the problem of demotivation was pointed out. The majority of the respondents claimed that students are poorly motivated; perhaps they feel that the study of the language was imposed up to them by the institutions or they may not appreciate the value of their ESP course.

In addition, the students' lack of interest in learning ESP causes a lot of problems in the teaching process, as most of the participants stated that they cannot develop their students' motivation. ESP teachers declared they need to adapt to the multifaceted nature of ESP and find ways to encourage the students' intention to learn and to act as consultants, which involves diagnosing the learners' language and communicative needs". [4:137]

In the present work we decided to establish the correlation of qualifications and experience of ESP teachers and ESP students that is very important in receiving good results.

I. For this purpose we offer the existing models of ESP teachers:
   - ESP teacher – EFL teacher with the experience in ESP/ME
   - Subject teacher with the knowledge of English
   - ESP teacher holding two degrees both in linguistics and subject area
   - ESP/ME teacher with specific ESP qualifications (newly offered model)

II. And the existing models of potential ESP/ME students:
   1. Elementary knowledge of GE (A1, A2)
   2. Intermediate knowledge of GE (B1, B2)
   3. Advanced knowledge of GE (C1, C2)
   4. Elementary knowledge of GE (A1, A2) with knowledge of specific subject
   5. Intermediate knowledge of GE (B1, B2) with knowledge of specific subject
   6. Advanced knowledge of GE (C1, C2) with knowledge of specific subject

In our opinion the most efficient cooperation between ESP teachers and ESP students will be:

1/I ESP teacher – EFL teacher with the experience in ESP – 2,3/II Intermediate knowledge of GE (B1, B2), Advanced knowledge of GE (C1, C2)

2/I Subject teacher with the knowledge of English –2,3/II Intermediate knowledge of GE (B1, B2), Advanced knowledge of GE (C1, C2)

4/I ESP teacher with specific ESP qualifications (newly offered model) – 2,3/II Intermediate knowledge of GE (B1, B2), Advanced knowledge of GE (C1, C2)

The ideal combination of teacher – student cooperation is: 4/I ESP teacher with specific ESP qualifications (newly offered model) – 2,3/II Intermediate knowledge of GE (B1, B2), Advanced knowledge of GE (C1, C2)

But in reality most often we have to deal with the following combination of ESP teacher-student cooperation model: 1/I ESP teacher – EFL teacher with the experience in ESP/ME- 1,2/II Elementary knowledge of GE (A1, A2), Intermediate knowledge of GE (B1, B2)

The combination 2/I Subject teacher with the knowledge of English (the sample discussed above on the example of Piri Reis University)-3/II Advanced knowledge of GE (C1, C2) is seldom for Georgia.

In our opinion the 3rd model of ESP teacher- ESP teacher holding two degrees both in linguistics and subject area, in our case it is GE teacher who would be qualified in Maritime field i.e. has fundamental knowledge of general maritime subjects is ideal for teaching ESP/ME but there are not very many ESP/ME teachers with such qualifications in the whole world and if such teacher teaches the model of the student 5,6/II (Intermediate knowledge of GE (B1, B2) with knowledge of specific subject, Advanced knowledge of GE (C1, C2) with knowledge of specific subject) the best possible results in acquiring ESP for particular field are guaranteed.

The students' models 4,5,6/II (Elementary knowledge of GE (A1, A2) with knowledge of specific subject, Intermediate knowledge of GE (B1, B2) with knowledge of specific subject, Advanced knowledge of GE (C1, C2) with knowledge of specific subject are very rare in Georgia.

The importance of knowledge of General English by students to take ESP course can be supported by following words of Kaosar M. in the article "The ESP Teacher: Issues, Tasks and Challenges": "Through training, ESP teachers are provided with the necessary knowledge and tools to deal with their own students' specializations. Bojović (2006) reminds that ESP teachers are not specialists in the field, but in teaching English, their subject is English for the profession but not the profession in English. They help students, who know their subject better than the teachers do, develop the essential skills in understanding, using, and/or presenting authentic information in their profession. A professional ESP teacher must be able to switch from one professional field to another without being obliged to spend months on getting started" [8:18].

In our opinion, the minimum level to acquire ESP is B1 (intermediate), otherwise work with authentic materials would be very difficult even after two years of ESP studies.

In the models of students singled out in this work (4,5,6/II) we mentioned such quality as subject knowledge and the students with such knowledge are ideal for mastering ESP but reality shows that students' models 1,2,3/II - Elementary knowledge of GE (A1, A2), Intermediate knowledge of GE (B1, B2), Advanced knowledge of GE (C1, C2) are much more common in Georgia and other countries and frequently the issue of simultaneous study of topics in native and English language is very acute. Of course, we fully agree with the idea expressed by Blagojević S. in the article: "Original Texts as Authentic ESP Teaching Material – the Case of Philosophy" when he says that: "In order to enable students of philosophy to understand philosophy texts in English, it is essential that course book texts should comply with the content of other subjects of the curriculum". [3:121] Nevertheless, still we think that if ESP teacher- ESP student combination 4/I (ESP teacher with specific ESP qualifications (newly offered model)- 3/II (Advanced knowledge of GE (C1, C2)) is applied, the cooperation and result could be successful even if the texts in English are rendered earlier than texts on the same topic in the native language.

There are many reasons why we think that it is necessary to give specific qualifications to ESP/ME teachers. We are sure if ESP/ME teacher receives appropriate qualifications before starting the work i.e. is educated according to the model of the curriculum offered in the present article and not during working process when gaining the practica experience as it usually happens, such teacher will be able to render content information more professionally to the students than EFL teachers. In this way ME lecturers would receive adequate qualifications to perform their duties in maximally effective way. We think it is expedient to support this idea by the words of John Swales: "All researches interested in assessing the progress of ESP as a component of ELT agree that one of the most constraining factors to this progress is the lack of "specialized teacher-training" (Swales1985: 214) [9:450]

Conclusion

If the model of Maritime teacher developed in the present article is applied in practice and some Maritime University offers Master's Degree program for EFL teachers to be qualified as ME teachers it could become the serious step in improving the quality of ME teacher training courses in the future. This opinion can be supported by the fact that thorough understanding of the

essence of the courses delivered by teachers themselves, the knowledge of terminology on professional level will change the quality of the lectures delivered and will help students to raise motivation during ESP studies that will result in the improved knowledge of English by professionals of different fields.

In order to implement this idea, the curriculum should be worked thoroughly on basis of collaboration between specialists of linguistics and Maritime field who are supposed to offer fundamentals of their disciplines for ME teachers' curriculum in the scope necessary to receive basic knowledge about the subjects and terminology in English to be able to work with similar authentic materials in English with ME students in future. If such curriculum is worked out, it can become unified basis for producing Maritime English specialists for different maritime educational institutions all over the world that will help in establishing one common standard for ME teacher training.

Abbreviations

GE – General English
EFL – English as a Foreign Language
ESP – English for Specific Purposes
ME- Maritime English

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Investigating language learners attitudes towards animated cartoon and its effect on improving vocabulary

Saipullayeva Makhinur Abdimutalipqizi
Master student of Khoja Akhmet Yasawi International Kazakh-Turkish University, Turkistan, Kazakhstan

Abstract. In today's world, it is very important to know a foreign language, especially English. Without it, life can become increasingly difficult. Therefore, it becomes a natural necessity to learn a foreign language starting from young age. The main goal is to acquire communication skills and the ability to understand and translate textual information. Original cartoons can play an important role in developing these skills. By watching them regularly, students can improve their perception, production skills, fluency and vocabulary. Moreover, original cartoons can expand cultural knowledge and understanding of the country whose language is being learned, which can increase motivation to learn. It is also important to include exercises that encourage learners to express their ideas, make comparisons and engage in dialogue. Also, it is very important to monitor comprehension before and after viewing to improve listening skills. This research study aimed to classify and identify attitudes towards using animated cartoons to improve vocabulary in schoolchildren's English language learning. A questionnaire was administered to the participants. A total of 60 students were participated from seventeen schools in Turkestan. According to the results obtained, students' attitudes towards the use of animated cartoons to improve their vocabulary were positive; moreover, there were no significant differences between classes or genders among the participants. In conclusion, animated films can serve as an effective tool for teaching English to young learners by providing engaging content and improving their overall language proficiency.
Key words: Language learners, attitudes, animated cartoon, vocabulary.

Introduction.

Teaching English to children has become a global phenomenon due to the rise of English language teaching around the world. Introducing English lessons at a younger age is becoming a common practice in several European countries. Numerous governments have tried to minimize the age of learning English and include it in the primary education curriculum. The demand for English language teaching materials for young learners has been steadily growing. This change in governmental policy and the motivation of parents to provide better language training for their children has been driven by parental concerns and the willingness to pay for additional English lessons for their children.

Today, primary school students are not adequately prepared to perceive authentic foreign language speech and communicate with native speakers. However, at the present stage, there is an active development and application of information technologies in the field of education, which influence teaching methods and tools and, when used correctly, enhance student learning.

Primary school students have a predominant visual-figurative type of thinking and have developed involuntary attention; therefore, it is recommended to use unexpected, bright and interesting forms of material presentation as well as short-term types of motivation in the educational process. For example, game-based learning activities, cartoons, elements of competition, notes,

praise, and awards This will not only increase students' motivation to learn a foreign language but will also have a positive effect on their educational results.

After analysing modern teaching materials, we can conclude that there are not enough exercises to develop listening skills in schools, despite the high potential of such exercises. At the initial stage of foreign language learning, listening not only helps to master lexical and grammatical material but is also a tool for learning phonetic aspects of the foreign language, such as intonation, rhythm and speech melody. Through listening exercises, students can improve their speaking skills by revising vocabulary and language structures.

Therefore, it is very important to study the problems of using cartoons for educational purposes to teach English to primary school students, especially for vocabulary development.

The significance of this study comes from the fact that in today's world, learning can be achieved in a variety of ways. Studying with a teacher, talking to a native speaker, taking certain classes and attending various courses are the most typical ways of learning English. However, there is another interesting and not too difficult way: watching feature and animated films and television programmers. During viewing, the viewer is immersed in the director's imagination and is unobtrusively introduced to the natural language environment. Animated cartoons are the simplest and most fun way for young people to learn a language. Young children often cannot grasp the meaning of words in cartoons, but they understand the content.

Animated cartoons are also inspiring because they are visually appealing, colorful, well-constructed and contain interesting and entertaining characters. Objects and characters appear sharper when they are enlarged with animation. This exciting style of teaching is likely to create motivation, and cartoons help to encourage learners' excitement for learning and active participation in the content of language sessions.

Furthermore, Attard (2022) considered that voices are exaggerated when animating. As a result, animated cartoons carefully and vividly integrate speech components such as stress, intonation and pronunciation. This point can be useful when teaching listening skills. Jain et al. (2021) stated that, using animated cartoons to teach speech abstractions such as pronunciation, stress and intonation can be useful. They have the potential to improve fluency in the target language.

On the other side of the coin, graphics or still pictures can be used to express the desired language point. However, they are less successful and less likely to attract attention than animated cartoons because, without animation, people and events lose much of their vibrancy and appear expressionless and meaningless (Bellido, 2021). And also, still, pictures have less vocabulary knowledge. In terms of vocabulary learning, video clips outperform still pictures and independent word definitions (Teng, 2022). Similarly, grammatical structures and elements can be taught efficiently in a framework supported by the visual and auditory components of cartoons.

According to Nicholls et al. (2020) the purpose of using original cartoons in the English language classroom is to practice methods of communication, to get acquainted with the life, customs and culture of English-speaking schoolchildren, to get acquainted with speech patterns, lexical and grammatical materials, as well as communication methods in various subjects in English. Dweich et al. (2022) stated that teaching English using original cartoons is based on competence-based and intercultural approaches. Students both recognise the characteristics of another culture and better assimilate the characteristics of their own culture.

Simultaneous auditory, visual and motor perception of an original cartoon positively affects the print power of regional and linguistic material, improves attention, increases long-term memory volume and memorization power, has an emotional effect and increases learning motivation.

Another aspect that makes animated cartoons inspiring is that they are humorous. Tsakona (2009) highly advocated the creation of animated cartoons as an excellent teaching tool in

language acquisition because they contain "a variety of facial expressions and gestures in humorous situations.". It is useful in terms of increasing vocabulary knowledge. He believes that humour is an important component and a constructive force in foreign language acquisition.

Zanettin (2010) also suggested that language teachers should incorporate humour and laughter into their teaching in order to increase motivation in foreign language education.

Özer and Avcı (2015) also argued that teaching English involves supporting students' emotional development by providing a happy classroom environment. Since young learners need to feel comfortable and safe when learning to speak the language, language teachers should recognise the benefits of using humour as a pedagogical and motivational technique. At the same time, good techniques like this are good for the students. They are regarded cartoons as educational tools that can help create a safe learning environment. Animated cartoons also make the learning environment more attractive and fun, making language learning an enjoyable experience (Bickford, 2011).

In addition, a cartoon film with characters and situations as close to life as possible contributes to the formation of functional literacy in young schoolchildren. In other words, by watching cartoons and doing exercises in a fun way, students learn to apply the knowledge acquired in the classroom in everyday life. In addition, an interdisciplinary teaching approach is used. For example, students work on mental arithmetic with animated characters.

Hearing speech and auditory memory are important factors in the listening process. The new vocabulary that is meaningful in sentences should be limited; sentence lengths and audio texts should be selected taking into account the amount of short-term memory of the students. Understanding speech by ear can greatly facilitate knowledge of the speech patterns of communication, the most common units of expression, and speech clichés.

Huifen and Dwyer (2010) suggested that, compared to static graphics, animation proved to be more effective in enhancing learning at all levels. According to Stempleski's (1987) research, it seemed that videos that have entertainment value from their origins can be very effective as educational tools. It is always fascinating to learn new ways to make learning more engaging and effective.

Vitasmoro (2009) pointed out that multimedia can be a powerful tool for engaging students because it provides both visual and auditory images simultaneously. This can help hold students' attention for longer compared to traditional printed materials. It is exciting to see how technology can be used to enhance the learning experience and make education more accessible and engaging for all.

Quach et al. (2022) found that digital data is easy to check and retrieve, allowing students to find difficult concepts quickly and teachers to highlight important material. This can be a powerful tool to support learning and help students succeed.

Lin et al. (2022) research highlights the benefits of using captions in educational videos. According to Lin et al. (2022) subtitles can provide students with the reassurance that they can double-check what they have heard if they need to, which can be particularly useful for those who have difficulty with certain concepts. In addition, students feel more comfortable watching subtitled videos and find them useful for understanding. Furthermore, Lin et al. (2022) notes that cartoons can be a particularly effective tool for younger students because they often contain clear and easy-to-follow plots that can help students better understands complex topics.

Animated cartoons can help strengthen visual memory because they are visually attractive. It is known that visual memory contributes significantly to the language acquisition process by activating all components of memory by combining the visual sense with the verbal and written elements of the language (Berney and Betrancourt, 2016). Thus, animated cartoons can stimulate the learner's perseverance and help him/her remember the parts of the target language learned. As we have already said, young children have a great capacity to use contextual cues and grasp

the world around them so that they can effectively understand events or circumstances, even if they do not fully understand the language used in animated cartoons (Arguel, 2009).

Düzkaya's (2021) research suggested that animated cartoons can be a valuable tool to enhance the learning experience. According to him, animated cartoons often contain socially relevant dialogue that can be particularly effective for young learners. In addition, their engaging and entertaining nature can help capture students' attention and make learning more enjoyable. However, as some animated cartoons may have unintended effects, it is important to consider the potential impact on young minds when selecting educational materials.

As language comprehension becomes increasingly important, this visual comprehension skill, which is particularly strong in young children, tends to diminish in inauthentic and didactic films. Young learners have to give up their childhood when they enter foreign language classes. In order to achieve this goal, language teachers need to develop children's visual-vision skills. Authentic cartoons in the target language can help you reactivate your visual comprehension skills.

Wahyuni's (2021) research shaded light on the potential benefits of using video in education. According to his, videos can be a rewarding experience for both students and teachers, as they offer a dynamic and engaging way of learning. When used in combination with well-structured activities that encourage active viewing and motivate participation, videos can be a highly stimulating and enjoyable learning tool. This is especially true for the e-generation, which tends to be more engaged with digital media.

The animated cartoons go beyond demonstrating and practicing English and realistically reflect the child's everyday life. In other words, language is provided in conditions that match the students' daily lives, engaging young learners on a much deeper level and taking language beyond the classroom. Over time, students begin to see animated cartoon characters as new friends and form relationships with them, leading to young people's enjoyment of English-speaking individuals. Animated cartoons also provide realistic role-play models. Children like to copy the characters by playing and acting out the scenarios.

It is also wrong to see animated cartoons only as a technique for conveying information about the target language. They provide much more about the culture of the language being studied. Animated cartoons allow individuals to learn how other people live and think. Through animated cartoons, students can learn about values, traditions, clothes, food, sports, schools, holidays, history and geography.

Similarly, animated cartoons can increase students' awareness of various cultures. As well as promote positive views about the target language, its people and its culture (Islam, 2021). The use of animated cartoons as teaching material provides students with a comprehensive, multimodal experience involving all their senses. Teachers can use animated cartoons to carry out a wide range of activities in the classroom, especially for visual learners, allowing them to benefit from a variety of abilities and learning styles. There are various possibilities for using physical activity, arts and crafts, and developing verbal abilities through animated cartoons.

Researches also suggest that authentic cartoons can have a positive impact on cultural views and knowledge about the country of the language being studied and the world as a whole. This can help motivate students to learn a foreign language and enhance their overall learning experience. By exposing students to different cultures and perspectives, original cartoons can broaden their understanding of the world and promote a more inclusive and diverse learning environment. During early language acquisition, animated cartoons can offer an effective way of contextualizing a new language and making it meaningful and memorable by showing authentic language use. A careful selection of cartoons or cartoon fragments is necessary for their effective use in teaching students of all ages.

Purpose of the study

The overarching purpose of the study is to classify and determine attitudes toward using animated cartoons to advance vocabulary in English learning for schoolchildren. The ultimate aim of this study is to provide solutions and suggestions that can help create a more comfortable and effective learning environment. To achieve this aim, the following research questions will be addressed:

RQ1: What is the participant's perception of the use of animated cartoons in teaching vocabulary?

RQ2: Are there significance differences between male and female participants regarding the use of animated cartoons in teaching vocabulary?

RQ3: Are there any significant differences between 4^{th}, 5^{th} and 6^{th} grade learners' in teaching vocabulary through animated cartoons?

Methods and Materials

Research design

This research utilized a quantitative study design in which a single data collection technique was used to achieve its objective. This approach, classified as descriptive research, involves the unaltered monitoring and measurement of variables to characterize the characteristics of a population. Bhardwaj (2019) noted that a convenience sampling technique was used to obtain relevant data, and sample participants were selected based on their convenient accessibility. This approach ensures that the findings of the study are both reliable and valid, providing valuable insights into the research topic.

Demographic Information

The study was conducted in the fall term of the 2023–2024 academic years and involved a diverse group of students studying in the fourth, fifth and sixth grades, as well as other age levels such as 11, 12 and 13. Respondents were participated from seventeen schools in Turkestan. The sample included 18 fourth-grade, 22 fifth-grade students and 20 sixth-grade students, while the distribution of male participants were 27 and female participants were 33. The study was conducted with the highest level of professionalism and ethical standards to ensure the safety and well-being of all participants.

Data collection and Instrument

The study conducted by Shu-Chin Su (2014) aimed to investigate students' attitudes towards the use of animated English cartoons in vocabulary teaching. A 12-item questionnaire based on the checklist items proposed by Shu Chin Su (2014) was used to collect data. The questionnaire used a five-point Likert-type scale that allowed respondents to express their level of agreement or disagreement with each item. The scale categorized responses into five levels, ranging from strongly agree to strongly disagree. The use of this approach enabled the researchers to gain a comprehensive and detailed understanding of the participants' perspectives on the topic. According to the information provided, the reliability coefficient of the questionnaire ($\alpha = .763$) is considered to be high.

Table 1. Reliability of the scale

Cronbach's Alpha	N of Items
,763	12

Data collection procedure and analysis

A questionnaire was given to the study group to collect data on their attitudes towards cartoons and their impact on vocabulary development. The participants were instructed to be honest in their responses to ensure the validity and reliability of the research. The data collected from the questionnaire was then processed using the Statistical Package for Social Sciences (SPSS) version 23.0. While analyzing the data, descriptive statistics were used to find means and standard deviations in order to answer the first research question. The second research question was investigated with the help of the Mann-Whitney U test. In addition, the Kruskal-Wallis H test was used to answer the third research question. The next section will provide detailed discussions on the development of the scale, the results, and the data analysis.

Results and Discussions

According to the information provided, the reliability coefficient of the questionnaire (α = .763) is considered to be high, which means that the questionnaire is a reliable instrument for measuring participants' attitudes towards animated cartoons and their effect on vocabulary development. A reliability coefficient of α = 0.600 is generally considered the minimum acceptable level for research purposes Metsamuuronen (2020), so a coefficient of 0.763 is considered to be quite high. Overall, this study provided valuable insights into the potential of English animated cartoons as a tool for vocabulary teaching.

The first question about “What is the participant’s perception of the use of animated cartoons in teaching vocabulary”? The clear results are presented in Table 2.

Table 2. Descriptive analysis of the research

	N	Minimum	Maximum	Mean	Std. Deviation
Total	60	2,56	3,49	3,0362	,42051

The researcher used descriptive analysis as a statistical tool to measure students' attitudes towards the use of animated English cartoons as teaching aids in vocabulary building. The analysis revealed that learners had an extremely positive outlook towards the use of animated English cartoons in vocabulary teaching. The results showed that the mean attitude score of learners towards the use of such cartoons was relatively high (M = 3.0362, SD=0,420), indicating that learners perceive animated English cartoons as a valuable and effective tool for vocabulary learning.

In addition, Mann-Whitney U test was conducted to find the answer to the second research question regarding the difference between male and female participants regarding the use of animated cartoons in vocabulary teaching in Table 3.

Table 3. Mann-Whitney U test

	gender	N	Mean Rank	U	P
Watching Animared Cartoons	male	27	64,18	398,400	0,322
	female	33	71,03		

*p <0 .05

The Mann-Whitney U-test was used to investigate whether there were any differences between male and female students in their perceptions of the use of animated English cartoons in vocabulary building. The results obtained from the analysis show that there is no significant difference between the genders in this regard. The mean score for males was M = 64.18 and for females, M = 71.03. It is noteworthy that both male and female students have a positive attitude towards the use of animated English cartoons in vocabulary teaching, and this shows that this method is effective for both genders. According to the findings of the research Berney (2016) suggest that no differences between boy and girl, and videos can be a powerful tool to enhance the learning experience and make training more enjoyable and effective for all involved.

Finally, in order to find the answer to the third research question, a Kruskal-Wallis H test was performed on the data to investigate the 4th, 5th and 6th grade students' interest in teaching vocabulary with animated cartoons. The results of the Kruskal-Wallis H test can be found in Table 4.

Table 4. Kruskall-Wallis H test

Grade	N	Mean Rank	H	p
4th grade	18	68,30	5,294	0,071
5th grade	22	46,94		
6th grade	20	57,19		

*p <0 .05

When Table 4 is examined, it is seen that there is no statistically significant difference between the mean ranking scores of the three groups regarding the effectiveness of animated cartoons in developing vocabulary. However, the mean ranking scores reveal that fourth grade students showed a higher level of improvement in vocabulary (MR = 68.30), while fifth grade (MR = 46.94) and sixth grade (MR = 57.19) students showed similar results.

It is noteworthy that the findings of the research are in line with the current findings. Vitasmoro (2019) suggested that using captions and cartoons can be powerful tools to enhance the learning experience and help students succeed. Overall, these findings suggest that incorporating original cartoons into language learning can be a powerful tool to promote cultural awareness, increase motivation and enhance the educational experience.

According to a survey, the majority of the students stated that they enjoyed using videos in their lessons. Buchori et al. (2017) found that incorporating animated cartoons into vocabulary learning had a significant impact on students' vocabulary knowledge. This study suggests that cartoons can be used as an effective media source for vocabulary enrichment. It is impressive that the use of animated cartoons, often seen as a form of entertainment, can have such a positive impact on academic performance.

Based on a number of studies, including those conducted by Aziza and Syafei (2018), Pitriana and Syahrudin (2013), and Krol (2016), there is evidence to suggest that animated cartoons can be a valuable resource for enhancing students' vocabulary learning. These studies suggest that incorporating animated cartoons into vocabulary learning can have a positive impact on academic performance. In general, it can be concluded that animated cartoons have the potential to serve as an effective media source in enriching students' vocabulary.

Cartoons can increase students' enthusiasm and motivation for learning English. In addition, students who are enthusiastic about the learning process can absorb new information more effectively.

In addition, animated cartoons provide an audio-visual sensory experience that can make learning more engaging and accessible to students. As a result, a student's vocabulary was improved by about 20% after watching and listening to animated cartoons. As a result, animated cartoons are a valuable resource for improving vocabulary and general language proficiency among learners.

Conclusion

A comprehensive research study has highlighted the effectiveness of using animated cartoons as a tool for learning English, particularly for children. The study emphasizes the effortless memorization of words and the subconscious application of language skills that children experience when learning through this medium. Starting language learning at an early age is recommended, as it enables children to learn at a quicker pace and encourages bilingual thinking. The study concludes that introducing English through cartoons, videos, and songs creates a language-rich environment that increases interest and enjoyment, leading to faster language acquisition. Animated cartoons have a strong emotional impact that aids children in retaining knowledge, and their absence of slang and complex grammar makes them particularly valuable in the initial stages of language learning. In addition, songs within cartoons are easily remembered and sung by children. Overall, the research affirms that watching cartoons is an interesting and highly effective approach to learning English as a second language.

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PRACTICE-ORIENTED TRAINING AT UNIVERSITY

Alshynbayeva Zh.
PhD, Karaganda University named after academician E.A.Buketov, Kazakhstan, Karaganda
Botabek G.
master' s student, Karaganda University named after academician E.A.Buketov, Kazakhstan, Karaganda

Practice-oriented education is a process of mastering by students of the educational program with the goal of instilling in students of professional competence through the implementation of their practical problems. In the basis of practice-oriented training should be the optimal combination of fundamental General education and vocational practical training.

For many years, the higher school has been focused on transferring knowledge to students, thanks to which they could be successful in science, business and production. Currently, many higher education institutions have lost their fixed practice places in accordance with the training profile. As a result, there is a shortage of qualified practice-oriented personnel in Kazakhstan who are able to successfully develop and implement high-tech technologies and implement real business processes. At the same time, the period of adaptation of a young specialist in production becomes too long, and the employer spends a lot of money on postgraduate training of a young specialist. This situation is the reason for the growing contradiction between the system of higher professional education and modern business and production. In the current situation, higher education needs to change the technology of education and move from knowledge transfer technologies to learning technologies with the acquisition of experience.

The new technology should be developed on the basis of practice-oriented learning, which should help to increase the motivation of the student to acquire professional competence.

There are four approaches to practice-oriented education:

1. Organization of educational, industrial and pre-graduate student practices in order to acquire real professional competencies in the field of training.

2. The introduction of professionally oriented learning technologies that contribute to the formation of students' personality qualities that are significant for their future professional activities, as well as knowledge, skills and abilities (experience) that ensure the high-quality performance of professional duties in the training profile.

3. Creation of innovative forms of professional employment of students at the university in order for them to solve real scientific, practical and experimental production works in accordance with the profile of study.

4. Creating conditions for the acquisition of knowledge, skills and experience in the study of academic disciplines in order to form a student's motivation and the conscious need to acquire professional competence during the entire time of study at the university.

The highlighted approaches cannot be implemented without students acquiring work experience, the level of which is determined in the logic of the competence approach. At the same time, competence should be understood as the ability to mobilize one's knowledge and experience to solve specific tasks in the profile of future activities.

Unlike traditional knowledge-oriented education, practice-oriented learning is aimed at the student's acquisition of practical experience, which acts as the student's readiness for certain

actions and operations based on existing knowledge, skills and abilities.

Based on this, the practice should be made continuous, preferably at the same enterprise or at another enterprise in the same industry.

During the educational practice, students master the academic experience of cognitive activity: type of production, raw materials, basic technologies, products, etc. Educational practice is preceded by students studying the discipline "Introduction to professional activity" under the guidance of a highly qualified professional. The result of studying this discipline should be the acquisition by students of general knowledge about their future profession, including specific professional competencies that are required to perform job duties in the workplace, about the sequence and methods of their formation during their studies at the university, which should contribute to the informed choice of a bachelor's degree profile.

During the period of practical training, students gain professional experience as interns or understudies of a specialist: studying production technology, familiarization with the technological equipment of the product production process, features of control and management of the technological process, etc. Experience is gained in solving a specific production task under the guidance of a professional in accordance with an individual task. In the period preceding the production practice, it is advisable to involve professionals from the production to form the motivation of students to study, including when doing coursework (projects) on a real practical topic related to future professional activity.

During the period of pre-graduate practice, the student must acquire sufficient knowledge and experience under the guidance of a specialist in order to begin performing work duties independently without long-term additional training at a specific workplace. In this case, an individual assignment for pre-graduate practice should aim to solve a real production task, which should then become the basis for the final qualification work.

Such a model of internships is feasible only if there are permanent internship places in accordance with the contracts concluded by the university and the existing permanent business (partnership) relations with specific enterprises and organizations. In such a relationship, employers consider students as potential employees and are interested in contributing to the formation of the required professional competence among students.

With the introduction of professionally oriented learning technologies, competencies are formed in the process of activity and for the sake of a future profession. In these conditions, the learning process turns into a learning/learning process: learning to know, learning to live, learning to do, learning to be.

The greatest effect can be obtained by using modern computer educational technologies, implying joint learning and creativity of the student and the teacher in the study of academic disciplines, the implementation of course projects (works), in the performance of educational research and scientific research:

- An educational resource is being created for student and teacher collaboration;
- the teacher places individual assignments in the resource that have practical or scientific significance with elements of novelty and practical significance, as well as methodological and other materials that may be useful to the student when completing the assignment;
- the student performs the task in the content of the resource;
- the teacher monitors the completion of the task, gives advice, advice and recommendations;
- the results of the work are summarized by the student in a report and evaluated by the teacher at the end of the academic semester.

The analysis of publications on this developing technology allows us to conclude that there are great prospects and effectiveness even when performing dissertations and other research works, when the supervisor communicates with the student within the framework of content or

via Skype.

It is important to create university-wide and institute practice-oriented platforms that allow for practice-oriented learning in the process of students performing real tasks in the field of learning with the participation of professionals commissioned by enterprises and organizations. As a result, a production and creative chain should be formed to solve a specific problem:

Teacher → professional → student performer → specific result.

Project-oriented training practice can also be implemented in individual academic disciplines:

- when studying the disciplines of the mathematical and natural science cycles;
- when studying the disciplines of the professional cycle.

When studying the academic disciplines of the above cycles, the teacher must:

- constantly emphasize the practical importance of the studied laws and processes in the implementation of technological processes in the field of training;
- according to the laws that are most important for understanding and using in practice, set students tasks for performing small-scale and time-consuming virtual projects for the implementation of the laws and processes being studied in the design of real technological processes;
- talented students who can be involved in research work on the subject of the department in the future should be given individual research, design and engineering (non-trivial) tasks of scientific and practical significance.

Students who complete virtual projects or complete individual assignments are exempt from completing homework.

In conclusion, we will outline the problems that arise when implementing practice-oriented education at a university:

1. Overcoming the teacher's stereotype of thinking on the organization of the learning process: move from knowledge transfer technology to learning technology with the acquisition of experience.
2. Improving the professional competence of the teacher in the knowledge of production.
3. Development of long-term mutually interested relationships with enterprises and organizations in the field of education.
4. Development of research and design work with the participation of students.
5. Practice issuing end-to-end creative projects to undergraduate students that turn into final qualifying works.
6. Have plans and activities at departments, especially graduates, to increase students' motivation to study.

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Philological Sciences

TECHNOLOGIES FOR DEVELOPING HEARING SKILLS OF STUDENTS IN KAZAKH LANGUAGE AND LITERATURE LESSONS

Shameyeva Meiramgul Beishanovna
primary school teacher, L.N Tolstoy Secondary school, Kazakhstan, Almaty region
Omarbekova Gulnaz Berdibekovna
primary school teacher, L.N Tolstoy Secondary school, Kazakhstan, Almaty region

Annotation. The article provides technologies for the development of students' listening skills in the lessons of the Kazakh language and literature. The constructive activity of the teacher is discussed with studying, understanding the curriculum, making periodic lesson plans, thematic-calendar plan, making a short-term daily lesson plan.
Key words: listening skills, technologie, level tasks, work with text, methods of mastering listening skills.

The educational process, which occupies the most important place in the modern era of globalization, in science, education, is aimed at instilling in students knowledge, skills and skills, the formation of personality, citizenship.

Today, in practice, we see: the influence of pedagogical skills, new technologies on close communication between teacher and student, student development, increasing the student's motivation to learn is very great.

Theoretical and practical studies show that the vast majority of difficulties in pedagogical activity are associated with pedagogical relationships, and not with insufficient scientific or methodological training of teachers. The so-called communication process is a very broad and broad concept. This is a conscious and unconscious verbal connection, the ability to receive and transmit information, systematically deliver it. In modern times, one of the basic rules of communication is that the form and content of speech depends on the age of a particular audience. Finishing a speech, a proposal, speaking to the country, being able to influence the listener, increase the interest of the listener and give consistent systematic knowledge depends on the position and qualifications of the teacher.

The pedagogical process is an important type of social activity. Innovative educators divided the structure of pedagogical activity into three parts. [1]

- Constructive
- Organizational
- Communicative actions.

The educational process of the teacher consists of constructive, organizational, communicative activities.

The constructive activity of the teacher begins with the study and understanding of the curriculum. Implemented in the form of long-term plans, thematic and calendar plan, short-term daily lesson plan. Teacher actions can be divided into three chains.

Constructive and meaningful. Constructive meaningful action consists of actions such as choosing educational material, planning pedagogical activities, developing a lesson plan, educational activities.
Constructive and operational activities are carried out in the form of planning the activities of the teacher and student in the pedagogical process, choosing and building the approaches used.
Constructive and material activities are implemented in the form of creating, organizing the material and technical base necessary for pedagogical activities. That is, teachers determine the necessary technical and visual aid, various equipment.
Constructive-material activity is realized in the form of compiling, organizing material and technical base necessary for pedagogical activity. That is, the teacher determines the technical, visual equipment necessary for the lesson.
The structures of this pedagogical activity are realized in interrelation, integrity, a single system. Although they are considered separately, it is a process realized in close interrelation.
I would like to share the ways of mastering listening skills in educational organizations in the discipline "Kazakh language and literature", the educational process of which is constructively built, closely conducted by organizational and communicative activities. "If you do not tell many what you have learned from education, what you have learned, what you have taught," said Akhmet Baitursynuly, the teacher of the nation, I can consider pedagogical innovations as a component of the educational process: experience, achievements, prospects.
My goal: to master the listening skills of one of the types of work with the text in the lessons of the Kazakh language and literature in educational organizations.
To master listening skills, you need to solve tasks:
Creating a climate or cultural area that increases educational activity, an environment where you listen to each other.
Closely related skills of listening, reading, pronunciation, writing (language orientation), because when listening, hearing the sounds of a word, correct reading, writing, pronunciation are performed together in the performance of tasks assigned to listening.
The use of new innovative technologies to solve the necessary tasks that motivate the student to speak the Kazakh language.
To pay attention, help, respect, encourage and appreciate students who speak the Kazakh language, who have poor performance (C) or average performance (B) and good performance (A) at various levels.
Types of methods for mastering listening skills:
Listening tasks: methods for creating an environment in which students listen to each other, such as a climate or a cultural area that increases the activity of learning, concentration of students ' thoughts. Starting with the organization of the audition. For example: starting a lesson using ICT.
"Part of the picture" (the student, while playing, builds a picture, repeats the words, because composing pictures seems like a chess game to him).
The song always cheers up, and for the same reason, it would be nice to start singing a beautiful melodic song with the class to mobilize for the lesson. For example: «Dobym, dobym domalakh!» the song is intended for young children and there are melodic types for young people. «Almatymnyn almasy» «Koshakhanym».
The «Voice of nature»technique: (staging graceful music. Rattling water, breeze, tinkling locusts, chirping birds sound together with melodious music)
Teacher: what sounds do you hear? So, what do you think about the theme of our lesson today?
Students: about nature. Then the teacher introduces the topic of the lesson and learning objectives, assessment criteria. These methods encourage the learner to understand Kazakh language words by ear and to speak in Kazakh.

Game «Aitys of sounds». It is one of the methods that teaches you to quickly, by heart, to play without any pressure in the form of a fun game, as well as to sound and hear the sounds characteristic of the Kazakh language. For example: Umitti tubit tutty, tubitti tutip bitti. Muz tuzdai, tuz muzdai. Sheshe, sheshe, neshe kese syndy keshe?

The method of "loop question": (accustoming the pupil to open expression of thoughts, asking a question helps the child to work through, predict the lesson, the types of questions vary depending on the content of homework or the preface to the task). The types of assignments given in elementary, middle school classes include listening to a short story audio text and composing tasks with different purposes.

Task 1. Tangled logical sequences. Listen to the text and find words with correct, incorrect, or unspoken answers to the given questions in the text.

Students are given questions written on a sheet of paper on the content of the text and several options for their answers. The student works individually, listens to the text and finds the correct answer in the given variant, tangled chains.

Task 2. Find the words in the search! Game method. Listen carefully to the text, find words that answer the given questions.

Method of «reasoning» opening the way to an audition through a question:

Are there nature reserves for conservation?

What reserves do you know? Mention the title of the text. Aksu-Zhabagly nature reserve

Teach important key words in the audition. Working with a dictionary:

Listen to the recorded new words on the board in audio.

The teacher himself reads aloud.

Students listen and reread the words.

«Find out! makes a comparison of the linguistic features of a word by the method» finding Synonyms, Antonyms and teaching the definition of a word in the dictionary.

«Who's ahead?» method. The proposed methodology develops the child's active memory, vocabulary. It is performed in a competitive and playful way. The tasks that children compete with are very attractive, more exciting, and increase their interest.

The rule of the game: 10 new words are written on the board, 30 seconds are given to memorize. The teacher remembers how many words the student has memorized, encourages and evaluates.

- Who memorized two words? (The student raises his hand and says two words. Children mark how many words they said on the leaflet in front of them)
- Who memorized 5 words? (The student raises his hand and says five words. Children mark how many words they said on the leaflet in front of them)

Thus, children do not even know how they remember 10 words.

Level tasks that are convenient for students who speak Kazakh at different levels.

Questions are posed by a text line. Listening to the text, the student determines the answer to the question, guesses the problem raised.

"Three Step Method". Listens to the audio material three times. Three tables are handed out on the topic. In the table "Step I. Step II. Step III" are spelled out. This task will help to examine the student's level of knowledge.

Step I. Listens to the audio material for the first time.

Audition questions to put the insert symbols, the questions written on the sheet and the boxes that are convenient for writing are left.

Questions to predict the general content of the text:

1. What is a nature reserve?
2. Can a nature reserve be used for economic purposes?
3.With what reserve was the very first one created in Kazakhstan?

Feedback.

Step II. Listens to the audio material a second time.
Questions to get accurate data (questions written on the sheet and handy writing strips left)
What land does the Aksu-Zhabagli reserve occupy?
Between which two rivers is the reserve located?
In what year was the Aksu-Zhabagli reserve established?
What list did the Aksu-Zhabagli Reserve get on?
Step III. The audio material is listened to a third time.
Discussion questions (questions written on the page and handy writing strips left out)
What is happening in the sanctuary? What question was raised in the text?
Why do you think birds, animals and plants are protected in nature reserves?
Have you been to nature reserves?
Why do you think a nature reserve is needed at all?
The descriptor:
Step I. Answers questions to understand the general content.
Step II. Answers questions to get accurate data. Defines what is being discussed.
Step III. Answers questions for discussion. Understands and describes what problem was raised. By listening, the student can reveal the topic and express his opinion about the problem being raised.
Understands the text with the help of questions at each stage.
Tasks after listening:
«Let's go, Team!» Method group work. Students sitting in a group should express what they understand from one sentence, interview, and answer.
The task is to create a cluster according to the text «Aksu-Zhabagly reserve» by the method of "Project protection" and protect the diagram as a group. Assignment of a task to work in a group by the method of a graphic organizer.
Method «Author's chair». Using the necessary keywords, students compose a 30-word short story with additional information and a line of questions. The author will go to the center and tell about what he understood from the audiovisual text.
Homework. Once a week, you need to give homework assignments to listen to audio texts. At the same time, the student has an increased opportunity to prepare the text of the audition by listening to it several times at home without haste. Of course, it is impossible to cover all the proposed methods in one lesson, so the teacher chooses methods based on the age of the students and the meaning of the text of the audition. Methods and tasks should not be of the same type all the time, as they will make students bored.
Achievements:
Depending on the purpose of the lesson, I can creatively prepare methods and tasks for mastering listening skills;
Students listened to each other, because the tasks and formative assessment, the criteria of the summary assessment prompted students to listen and understand the audio text;
The quality of education and academic performance at the end of the year increased compared to the quality of education at the beginning of the year;
In each class there were students who understood the audio text and were able to use their vocabulary;
Level tasks, the art of reading texts by the announcer, performed in different magical tones of voice, contributed to the formation of the student's listening skills.
Today, one of the main goals of the country is to improve the development of Kazakh language teaching and learning practices.

To be a teacher, to respect him, to preserve his honor is the duty of every teacher. The path that forms the appropriateness of the teacher's name is the teacher's path, position, attitude and actions that lead him/her to constant search.

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THE EVALUATION CRITERIA OF IELTS READING AND LISTENING

Aliyeva Nuray Vasif
Nakhchivan State University, ORCID ID 0009-0004-5480-2604

Abstract

This paper critically evaluates the assessment procedures employed in the International English Language Testing System (IELTS) listening and reading sections. Drawing upon established literature and empirical evidence, the examination centers on the validity, reliability, and effectiveness of these assessment components in gauging candidates' English language proficiency. Through an exploration of the structural intricacies, scoring methodologies, and research findings, this paper provides a nuanced understanding of the evaluation mechanisms inherent in the IELTS listening and reading sections, offering insights for both test administrators and candidates.

Key words: IELTS reading, IELTS listening, IELTS evaluation, IELTS assessment, assessment of IELTS reading, assessment of IELTS listening, assessment of receptive skills in IELTS.

INTRODUCTION

The International English Language Testing System (IELTS) serves as a pivotal instrument in evaluating English language proficiency for academic and immigration purposes. Central to this evaluation are the listening and reading sections, which pose unique challenges and opportunities in the assessment domain. This paper embarks on a scholarly inquiry into the evaluation of these sections, aiming to elucidate their assessment validity, reliability, and effectiveness. By examining the underlying frameworks, assessment criteria, and scoring systems, we endeavor to unravel the intricate mechanisms that govern the evaluation of language proficiency within the IELTS paradigm. Moreover, through a synthesis of empirical studies and theoretical perspectives, this paper seeks to provide a scholarly discourse on the evaluation of IELTS listening and reading proficiency, thereby contributing to the broader discourse on language assessment and testing. Before all, instructional materials considered for IELTS students should be relevant to their level of language proficiency [2]. Receptive skills can be developed through different methods including CLT [12] [13], the Direct method, SLT, the Audiolingual method. In its turn, CLT has some techniques while practicing the language [1], [5], [10]. Sometimes, traditional methods are also effective in the development of listening and speaking skills [7]. As mother tongue is ignored in IELTS exam, there is no need to use native language [6].

MATERIALS AND DISCUSSION

Each skill in IELTS exam is evaluated in different ways. Both receptive and productive skills have diverse and complicated evaluation criteria. Writing skill does have the criteria of coherence and cohesion, speaking skill also has the same criteria, though fluency and correct pronunciation are only met in the evaluation of speaking skill. Receptive and productive skills are sometimes correlated with each other in evaluation process, as well [11].

Evaluation of Reading

The IELTS Reading examination plays a crucial role within the International English Language Testing System (IELTS), evaluating candidates' capacity to understand and interpret a diverse range of written materials commonly encountered in both academic and everyday settings [15]. Achieving proficiency in this section demands not just adept reading comprehension abilities,

but also effective time management and strategic planning. In this article, we explore the complexities of the IELTS Reading test and provide actionable strategies to assist candidates in achieving success.

Understanding the Format:

The IELTS Reading test comprises three sections, each featuring diverse passages sourced from authentic materials such as newspapers, magazines, journals, and books [9]. Candidates are allotted 60 minutes to complete the entire examination, with each section typically presenting one long reading passage or several shorter passages covering various topics.

Navigating Question Types:

Candidates encounter a diverse range of question types in the IELTS Reading test, including multiple-choice, true/false/not given, matching headings, sentence completion, summary completion, matching information, matching features, diagram label completion, and short answer questions. Understanding the nuances of each question type and practicing extensively is crucial for success.

Scoring and Time Management:

Scoring in the IELTS Reading test is straightforward - each correct answer earns one mark, with no penalty for incorrect responses. However, effective time management is essential, as candidates must complete all questions within the allocated 60 minutes. Strategizing and allocating time wisely across the sections ensure sufficient time for reading passages, understanding questions, and answering accurately.

Preparation Strategies:

- To prepare adequately for the IELTS Reading test, candidates should adopt a multifaceted approach:
- Familiarize yourself with the test format, question types, and instructions.
- Practice reading a wide range of texts on various topics to enhance comprehension skills and build vocabulary.
- Develop efficient skimming and scanning techniques to quickly locate key information within passages.
- Identify keywords and phrases that signal important information and understand how they relate to the questions.
- Manage time effectively to ensure all questions are attempted within the allocated 60 minutes.
- Review and analyze mistakes to identify areas for improvement and adjust study strategies accordingly.

Achieving success in the IELTS Reading exam demands thorough preparation, strategic planning, and adept time management. By grasping the format, question types, and scoring standards, candidates can customize their preparation tactics to optimize their performance on exam day. With consistent practice and dedication, attaining proficiency in the IELTS Reading test becomes attainable, opening doors to enhanced prospects in academic and professional pursuits.

Evaluation of Listening

Numerous audio and video tasks are performed in IELTS listening practice in order to boost the concerning skill [3]. The IELTS Listening test is a pivotal aspect of the overall IELTS examination, serving as a barometer of candidates' ability to comprehend spoken English across diverse scenarios. Below is an in-depth assessment of the IELTS Listening test:

1. Comprehensive Format:

The IELTS Listening test is structured into four sections, each featuring distinct types of spoken recordings. These recordings encompass conversations between individuals, monologues such as lectures or speeches, and discussions on topics ranging from academic subjects to everyday life situations. The assortment of recording types ensures candidates are exposed to various accents, speech patterns, and subject matters [8].

2. Diverse Question Types:

Throughout the Listening test, candidates encounter a plethora of question types, including multiple-choice, matching, sentence completion, and note completion. These questions are meticulously crafted to gauge a wide array of listening skills, such as grasping main ideas, identifying specific details, discerning opinions or attitudes, and accurately following instructions.

3. Gradual Difficulty Progression:

The difficulty level of the recordings escalates progressively throughout the test [14]. While the initial section often comprises straightforward language commonly encountered in everyday conversations, subsequent sections introduce more intricate vocabulary, idiomatic expressions, and nuanced concepts . This gradual elevation in difficulty compels candidates to adapt their listening abilities to varying contexts and linguistic styles.

4. Scoring Mechanism:

Candidates are awarded one mark for each correct answer in the Listening test, with no penalty for incorrect responses. The cumulative score is then mapped onto the IELTS 9-band scale, providing a standardized measure of candidates' listening proficiency. This scoring system ensures impartiality and uniformity in the assessment process.

5. Importance of Time Management:

Effective time management is imperative in the IELTS Listening test, as candidates are allotted approximately 30 minutes to complete all four sections. This timeframe encompasses both listening to the recordings and transferring answers to the answer sheet. Therefore, candidates must strike a delicate balance between actively engaging with the recordings, comprehending the content, and accurately recording their answers within the stipulated timeframe.

6. Strategic Preparation Strategies:

To excel in the IELTS Listening test, candidates should adopt strategic preparation techniques, such as:

- Familiarizing themselves with the test format, question types, and instructions.
- Practicing listening to a diverse range of English accents, including British, American, Australian, and Canadian.
- Cultivating effective note-taking methodologies to capture crucial information while listening to the recordings.
- Enhancing their capacity to decipher main ideas, specific details, opinions, and attitudes conveyed in the recordings.
- Regularly undertaking practice tests under timed conditions to simulate the exam environment and refine time management skills.

7. Feedback and Continuous Improvement:

Following practice tests or the actual examination, candidates should meticulously review their answers and solicit feedback from instructors, tutors, or language partners. Identifying areas of weakness and implementing targeted improvement strategies can significantly enhance listening proficiency over time.

CONCLUSION

In essence, the evaluation of the IELTS Listening and Reading sections underscores their pivotal role in assessing candidates' English language proficiency across diverse contexts. The intricate formats, diverse question types, and rigorous scoring mechanisms employed in these sections serve as robust measures of candidates' abilities to comprehend written and spoken English. Through strategic preparation, adept time management, and targeted improvement strategies, candidates can navigate these sections with confidence, thereby enhancing their

prospects in academic and professional endeavors. This preparation process can be based on both student-centered and teacher-centered focus of instruction [4].

The IELTS Listening and Reading sections offer not merely a test of linguistic competence but also a reflection of candidates' adaptability, critical thinking, and communicative effectiveness. As candidates engage in comprehensive preparation, they cultivate not only language skills but also valuable test-taking strategies that transcend the examination hall, proving beneficial in real-life scenarios.

As the demand for English language proficiency continues to grow in global academia and professional spheres, the significance of the IELTS Listening and Reading sections as reliable indicators of language competence remains indisputable. By embracing the challenges posed by these sections and leveraging the plethora of resources and preparation strategies available, candidates can unlock opportunities for personal and professional growth, thereby advancing towards their aspirations with confidence and competence.

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CLIL AS THE MOST PRODUCTIVE METHODOLOGY

Babayev Javid
Senior lecturer of the chair "English and methods", Nakhchivan State University

Abstract
The article scrutinizes the characteristics of the CLIL which is regarded as one of the most productive methodologies. CLIL teaches subjects along with the language. This is the main essence and the most distinctive feature of CLIL. Along with certain advantages, CLIL owns some demerits. One of the negative sides of the CLIL is that not all the students show effective results while teaching the language through this method. Hence, it turned out that CLIL is not the most effective method despite its productivity. CLIL was compared with CLT in terms of coverage of language skills. It was revealed that CLT and CLIL are similar to each other in this regard.
Key words: CLIL, CLT, methodology, productivity, effectiveness, language acquisition

CLIL whose meaning is content language integrated learning is one of the most productive language and discipline teaching methods. However, it does not mean that it is the most effective method. The application of this method among the language learners does not always result in effective language acquisition. This is mainly because of the heaviness of the program which is abundant in a myriad of terms pertaining to diverse disciplines. Only 25 % of the language learners are successful in language acquisition through this method. This methodology was revealed and discovered in 1994. Another name of this methodology is subject language integrated learning. David Marsh [11] made the first official mention of the idea of "Content and Language Integrated Learning." The author claims that this method indicates "content-language integrated learning," which denotes any educational setting that combines two courses. In addition, the discipline is taught using the students' second language, which is their non-primary language, for the whole course of study [12]. When disciplines or their portions are taught in a foreign language, this sort of teaching is what is meant by the definition.

The two basic notions of "language" and "integration" serve as the foundation for the strategy of subject-language integrated learning. There are two types of CLIL: hard CLIL and soft CLIL. Any academic subject can be taught in English thanks to hard CLIL (provided it is L2 for students). Students study geography, literature, biology, physics, or even play sports games during such a course. The goal of soft CLIL, which English teachers employ, is to educate students how to learn a foreign language using materials and ideas from other areas.

CLIL is first and foremost a method of teaching broad knowledge rather than multilingualism. The teacher can link facial expressions, gestures, pictures, presentation sound, etc. for a better understanding of the material. This requires the creation of a safe psychological climate in the classroom. It also implies the use of only one (foreign) language, the same teacher, and the same audience [10].

The CLIL methodology has some positive points as follows:

- increases students' intercultural understanding;
- improves their ability to communicate in a foreign language in real-world situations;
- enables students to communicate with each other more successfully when speaking a foreign language;
- Students' thinking is developed and their creative potential is unlocked;
- their motivation and self-confidence are increased;

- all language skills are trained;
- language competence and natural oral speech skills are improved;
- a curiosity for various languages and their applications in various spheres of life is developed;

Learning a foreign language involves memorizing a lot of vocabulary. Without learning the language's vocabulary, it is impossible to acquire the language and comprehend information on important topics in a foreign language. As a result, learning vocabulary is essential to putting the CLIL methodology into practice. Students who want to communicate effectively in a foreign language need to have a strong grasp of vocabulary as well as the skills necessary to employ it.

The study of subjects from different training fields aids in the process of understanding specialized terminological vocabulary and particular language structures, expanding students' vocabularies and facilitating the application of newly learned knowledge and abilities in the future [6].

Unquestionably, the CLIL methodology's interdisciplinary knowledge integration can raise student accomplishment levels. The conflict between the content of core topics and students' foreign language speech skills and abilities should be resolved as soon as they have reached their full potential. required changes to both theory and practice so that CLIL could properly support kids' balanced and ongoing linguistic development.

The 4C paradigm governs integrated subject-language learning. The 4C model, developed by Professor D. Coyle, focuses on four areas: content, communication, cognition, and culture. It promotes subject-language integration through the development of content knowledge, skills, and understanding as well as participation in related cognitive processing and communicative context interaction.

D. Coyle modeled the 4C principle as a pyramid with three vertices, each of which represents one of the concept's components. It's interesting to note that the communication component is at the top of the pyramid, indicating that communication should be used to execute the other components (content, cognition, and culture) [5, p.182].

The ultimate goal of the CLIL approach, according to P. Mehisto, D. Marsh, and M. Frigols, is to assist students become capable and motivated bilingual or multilingual individuals who can successfully acquire knowledge of the subject and the language at the same time [14,p.29].

Interrelation between the content and subjects is shown as follows:

- Content is clearly connected to the community in the classroom and beyond outside of it;
- Students apply new content and develop pertinent skills through experiential activities;
- The content is important but not overwhelming;
- Content from various subjects integrated;
- The cultural aspect is integrated into all subjects.

Table arrangements, classroom displays, and other resources are used to assist learning and communication. Language/communication skills are developed throughout the course. Students actively appreciate the right to engage in all classroom activities.

P. Ball [13,p.31] provides the following six-point description of CLIL:

1. Logical progression of concepts: one concept follows another logically.
2. Conceptual direction: Conceptual and/or procedural content should serve as the basis for the criteria used to gauge student comprehension of the subject matter.
3. Language as a medium: Discursive frameworks that are related to content naturally include language.
4. Special job design: linguistic support is required and the content is subjected to greater procedural "breakdown" (scaffolding strategy).
5. The Trinity theory, which holds that conceptual content, procedural content, and linguistic content are three components of education that function harmoniously.

6. Activities: Tasks to enhance peer communication, activities to strengthen reading methods, monitoring student outcomes (oral and writing), and activities to engage higher cognitive skills are the four activities best suited for CLIL practice [13].

When we compare CLIL with other methodologies regarding the comprehensibility of language, we witness that the highest comprehensibility outcome belongs to CLT [2], [4]. Most students show the most effective language acquisition while learning a language through CLT [8]. In terms of covering all language skills CLIL and CLT show the equal results [9]. Since both methodologies involve all four language skills in teaching process [7]. Usage of mother tongue is not fully neglected while learning a language through CLIL [3]. Some terms covering different subjects can be explained in native language to bring clarity to some obscure points.

To compile instructional materials covering different subjects is another challenge. Except language teachers, subject specialists specialized in relevant disciplines should be involved in compiling process [1]. They should work in collaboration in order to produce effective and productive teaching materials. They should give and get advice mutually to compile a worthy manual which will meet students' needs and interest.

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About Some Features of production of quality forms in Kartvelian Languages

Tamar Mamardashvili

Accoss. Professor of Kutaisi Akaki Tsereteli State university, Kutaisi, Georgia

Introduction

The production of quality forms is one of the important issues of the comparative grammar of Kartvelian languages, because it characterizes all languages (Georgian, Mengrelian and Svan), although with more or less changes. As the form of quality is obtained on the basis of opposition, relation and vomparison of certain signs or properties of objects and indicates the sign of the subject itself, therefore, we usually discuss about quality in relation to adjectives, of which only primary adjectives have the ability to produce quality, however, the content of quality can also be conveyed with verbs and nouns by means of adverbial prepositions. This semantics is even more diverse in the dialects of the Georgian Language.

Key words: Kartvelian Languages, affixes, positive, superlative and relative degree, Adjective, verb.

Full text

Represwentation of a feature of a subject with a greater or lesser amount is based on the comparison of the original and the resulting. During the comparison, the form taken as the starting point (root) in Georgian language is considered as a positive degree, and the forms expressing more or less amount are considered as superlative and relative degrees.

The situation is different in other Kartvelian languages. If Georgian has only the plural form to express the greater amount of the subject, in Megruli the equal degree form is also confirmed to denote the same function. It is also based on comparison, it express equality. Professor Akaki Shanidze points out that abstract nouns formed from adjectives with სი–ე/ si-e (სი–ო/si-o) affixes are used in Georgian with the meaning of equal degree: სისქე/thickness, სიმაღლე/height, სიგრძე/lenght and etc., which require the name of the comparable subjevt, like the equal noun of Megruli, in relative rotation [7, p.141].

In Svanuri, we do not have an equal like Megruli, but in adition to the superlative, there are also superlative forms, which convey the property of the subject more than the same property of all other subjects.

Opposite of positive quality, two-two forms are attested in such languages as Greek, Latin, Russian, which produce comparative (comparative degree) and superlative (superlative degree) forms. The situation is similar to Georgian in Arabic.

The Term superlative indicates the excess and strengthening of the property of the subject compared to the positive quality (producer უ–ეს/u-es konfix). Such production is equally carried out in adjectives, whether they are primary or adverbial, of Georgian or foreign origin.

It is interesting that the excess of characteristics is felt in such forma as: უმცირესი/the smallest, უმოკლესი/ the shortest, უდაბლესი/thelowest, უცოტავესი/the least and so on. Although semantically, they seem to express a lesser amount of the degree compared to their original forms, but in fact this degree is present in a greater amount in the quality forms than in their original forms – მცირე/ smal, მოკლე short, დაბალ/low, პატარა/little, which is confirmed by the proper grammartical producer.

Compared to the positive, the relative degree form is expressed by a smaller amount of the subject sign. As indicated in the scientific literature, the relative degree forms were not equally

common throughout the development of the Georgian language: they were not in ancient Georgian, because the descriptive production prevails in the monument of that time.

The relationship of the superlative form to the positive is not the same as that of the relative to the same positive, because the superlative expresses the sign of the subject in a greater amount, indefinitely, and the relative – in a smaller amount, but with a kind of determination, approximation, a little. For example: უ-თეთრ-ეს-ი/whitest is of the highest degree in whiteness, while მო-თეთრ-ო/-mo-white is close to white, it has signs of whiteness, i.e. it is slightly white. Names are determined by semantics. Relative degree forms are not produced from all adjectives. Its origin is mostly from names denoting color and size. Similar forms can be found in Megruli and Svanuri with their producers.

From rool adjectives, some have all three forms of degree, some have two forms. There are those, who do not produce degree forms at all: ნელი/slow, სველი/wet, ჩუმი/silent, კოჭლი/lame... As for relative adjectives, since they are of secondary origin,thhey lack ability to produce such forms. For example: ბედნიერი/happy –უბედნიერესი/ the most happy, ღონიერი/brave – უღონიერესი/the most brave, ძლიერი/strong – უძლიერესი/ strongest...

Those non-adjectives, which have the capacity to produce degree to some extent with formant possibility, belong to them. These are მიმღეობა/participle, because participle, as one of the forms of the adjectives in Georgian, can equally adapt to both noun and verb signs: მჯობნი/better – უმჯობესი/the best, მწუხარე/sad – უმწუხრესი/saddest, საძაგელი/detestable – უსაძაგლესი/the most detestable, საყვარელი/lover – უსაყვარლესი/ the lovest, and so on

Besides mo-prefixed forms, we also find the tsa-prefixed production: მოყვითლო//წაყვითლო, მომჟაო//წამჟაო and so on. It is interesting, that mo- and tsa- have the same origin as preverbs [7, p. 141].

The preverbs mo- and tsa- express fewness in the mentioned verbs and are used with the same meaning in adjectives of relative degree. In the Scientific literature, when discussing the functions of preverbs, their role in denoting and conveying the scarcity or relativity of a action is highlighted. Tsa- preverb shows a littleness in vwerbs as well: წაიმუშავა (tsaimushava), წაითამაშა (tsaitamasha), წაიმღერა (tsaimgera), წათვლიმა (tsatvlima). The same function has the preverb tsamo-: წამოწითლდა (tsamotitlda), წამოიზარდა (tsamoizarda), წამოიჩიტა (tsamoichita) da so on. Such definition are given in the dictionary of Sulkhan-Saba Orbeliani . that we pay attention to marking the relativity of the action [4, p. 363-369].

In old Georgian the preverb she- was most often used to express the scarsity, relativeness and relative lack of quality or volume of an action. This meaning seems to havr developed from its main function, namely, from the display of action: შემწუხრდა (shemtsuxrda), შეემშია (sheemshia), შებრკოლდა (shebrkolda) [2, გვ. 141-146].

In modern Georgian language the smallness of the action often express the preverb mo-: მოათბო და გაათბო (moatbo da gaatbo), მოალბო – გაალბო (moalbo da gaalbo), მოაცოცხლა – გააცოცხლა (moacocxla da gaacocxla)... Obviously, the latter presents its main content with fulness, this fulness is no longer felt in the same verbs wit mo- preverbs, where the performance of action is characterized by a small amount. There are a lot of such verbs in modern Georgian: მოასველებს (moasvelebs) – ცოტათი დაასველებს (tsotati daasvelebs); მოიზარმაცებს (moizarmatsebs) – ოდნავ ზარმაცია (odnav zarmatsia); მომხიარულდება (momxiaruldeba – თანდათან გამხიარულდება (tandatan gamxiaruldeba) [5, p. 686-695].

The possibility of expressing lack of action by the preverb “mo-” is also confirmed in the dictionary of Orbeliani: მომკვდარუნება/ dying, to make oneself look like a dead person; მოხრა/bending – slightly bending; მოთუთქვა/to cook a little [4, p. 496-505].

As the analysis showed, the content of the relative clause can be conveyed not only with adjectives and verbs, but also with nouns. In addition, in such forms, not only the relative degree is used in front of the verb to contrast with the positive, but also the superlative.

It is clear that the understanding of realitivity goes beyond the realm of adjectives. This semantics is even more diverse in the dialects of the Georgian language.

It is real that Georgian language has a descriptive production, when adverbs are usually used with the name conveying a sign or degree, such as: ფრიად/much, ძალიან/very and so on: ფრიად კეთილი/very kind, მეტად დიდი/great.

In addition to the named, there are other means of description, such as:

a) repeating the name of this or that sign (გრძელი/long, გრძელი წვერი/long beard);

b) repeated adverbs with conjunctio და/andგან (მეტად და მეტად/more and more);

c) repeating a nouns, to the first one adding the preposition ზე/on (ულმობელზე ულმობელი/dangerous, ბევრზე ბევრი/many and many);

d) base-doubled composities that express one or another sign of the subject in a larger amount (დიდ-დიდი/big-big, ცხელ-ცხელი/hot-hot).

All these stylistic devices, as well as descriptive production, although they convey more content of the subject sign, they cannot be considered quality forms, despite the fact thst such forms are more common in Modern Georgian and in Kartvelian languages in general. We have neither a characteristic comparison of degree nor a proper syntsctical constructions with them.

In the modern Georgian literary language, artificial forma of degree created with the prefic ა უუ-/uu- are rarely found (უუკეკლუცესი/the most beautiful, უუკიდურესი/the most fast, უუმთავრესი/the main, უუდიდესი/the biggest, უუმთავრესი/ the main and so on.) Such kind of words was not in ancient Gerogian Language, In grammatical literature, such superlative forms are called intensive, because these forms were used when they wanted to convey some sign of the subject.

Results

The production of degree is equally carried out by situation in adjectives, whether they are primary or adverbial, Georgian or foreign in origin. Those non-adjectives, which have the capavity to produce, quality to some extent with formant possibility, belong to them. These are participle, and the role of preverbs in denoting and conveying the scarcity, scarcity or relativity of the action was also highlighted.

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The Basics of Linguistics

Ayten Ibishova Oruc
Teacher, Hedef course LLC , Orchid ID: 0009-0000-1380-441X

Language is all around us. It is what enables us to communicate with others, express ideas and emotions, and think of the world in different ways. The study of these is linguistics.Linguistics is a scientific study that analyzes the structure and meaning, history and improvement, and the various use of language with many different forms according to the time. Linguistics aims to discover the science of languages, how they originate and evolved and further how our mind perceives them to communicate.In simple terms, linguistics can be referred to as the scientific study of language. It involves the analysis of the many different aspects such as the meaning, form and context of language.People who have an education in linguistics and practice linguistic analysis are called linguists. These professionals seek to better understand the nature of languages - how they came about, how they evolve, how humans acquire languages, the commonalities and differences between languages, and a variety of other things of value. Because of the complex nature of languages, the study of linguistics is divided into multiple branches.

Various building blocks of different types and sizes are combined to make up a language. Sounds are brought together and sometimes when this happens, they change their form and do interesting things. Words are arranged in a certain order, and sometimes the beginnings and endings of the words are changed to adjust the meaning. Then the meaning itself can be affected by the arrangement of words and by the knowledge of the speaker about what the hearer will understand. Linguistics is the study of all of this. It encompa sses not only the study of sound, grammar and meaning, but also the history of language families, how languages are acquired by children and adults, and how language use is processed in the mind and how it is connected to race and gender. With close connections tothe humanities, social sciences and the natural sciences, linguistics complements a diverse range of other disciplines such as anthropology, philosophy, psychology, sociology, biology, computer science, health sciences, education and literature. There are five major types of Linguistics. They are :Phonology, Phonetics, Syntax, Semantics, Morphology ,Pragmatics .Each of the five branches focuses on a single area of language.

1.Phonetics is the study of the sounds of speech. It includes understanding how sounds are made using the mouth, nose, teeth and tongue, and also understanding how the ear hears those sounds and can tell them apart. A study of phonetics involves practicing producing (sometimes exotic) sounds, and figuring out which sound you heard. The wave form of each sound can be analysed with the help of computer programs. In sign language, phonetics refers to the the possible shapes, movements and use of physical space.Phoneticians study both the production of speech sounds by the human speech organs (articulatory phonetics) and the properties of the sounds themselves (acoustic phonetics).

2.Phonology - This branch studies how different sounds come together to form the spoken words of a language. It is the systematic arrangement of sound patterns in languages and dialect.Phonology makes use of the phonetics in order to see how sounds or signs are arranged in a system for each language.

Phonologists describe the contrastive consonants and vowels in a language, and how pronunciation is affected by the position of the sound in the word and the sounds that are nearby. They are also interested in syllables, phrases, rhythm, tone, and intonation.

3.Morphology looks at how individual words are formed from smaller chunks of meaningful units called morphemes.In other words Morphology refers to the study of the internal structure of the

words of a language. In any given language, there are many words to which a speaker can add a suffix, prefix, or infix to create a new word. In some languages, these processes are more productive than others. The morphology of a language refers to the word-building rules speakers use to create new words or alter the meaning of existing words in their language.

4.Syntax is the study of sentence structure. Every language has its own rules for combining words to create sentences. Syntactic analysis attempts to define and describe the rules that speakers use to put words together to create meaningful phrases and sentences.Syntax is also the study of rules of word arrangement to form proper phrases and sentences. In English, the simplest form of syntax follows the 'Subject + Verb + Object' formula.

5.Semantics is the study of meaning in language. It focuses on the relation between words, phrases and other bits of language and on how these words and phrases connect to the world. Linguists attempt to identify not only how speakers of a language discern the meanings of words in their language, but also how the logical rules speakers apply to determine the meaning of phrases, sentences, and entire paragraphs. The meaning of a given word can depend on the context in which it is used, and the definition of a word may vary slightly from speaker to speaker.

6.Pragmatics - the study of how language is used in context.This is one of the more unique branches of linguistics, in that it studies how the context of spoken or written language relates to semantics or the meaning of words. All speakers of a language use different registers, or different conversational styles, depending on the company in which they find themselves. A linguistic analysis that focuses on pragmatics may describe the social aspects of the language sample being analyzed, such as how the status of the individuals involved in the speech act could affect the meaning of a given utterance.

The field of Linguistics is vast and covers a range of different subfields. Here are the main branches of Linguistics: Psycholinguistics ; Sociolinguistics ;Applied Linguistics ;Computational Linguistics ;Comparative Linguistics ;Historical Linguistics ;Stylistics ;

1.Psycholinguistics is amongst the most popular branches of linguistics that studies the relationship between psychological processes and linguistic behaviour. An example of psycholinguistics is found in the study of how humans perceive language .Psycholinguists often work with child psychologists and conduct research on speech and language development to understand how humans perceive and produce language.

2.Sociolinguistics is the study of how language is used in society, addressing such questions as what makes some dialects more "prestigious" than others, where slang comes from and why it arises, or what happens when two languages come together in "bilingual" communities.
It is also involved in the study of the effects and interactions between language and different social factors like ethnicity, social class, gender, cultural norms etc.

3.Computational linguistics - This is a relatively new branch of linguistics that deals with the use of language by computers and programs. Such branches of linguistics leverage computer science to analyse, model, and produce speech. It combines concepts from computer science, programming and coding with linguistics to determine how language functions in the context of computing and operating systems.

4.Comparative Linguistics is one of the sought-after branches of linguistics that is involved in the study of identifying similar and dissimilar properties between different languages of a common origin. It studies the development of languages through a comparative analysis of two or more different languages that evolved from a single-parent language . For instance, romance languages like Italian, French, and Spanish differ in speech and construction even though they all originated from Vulgar Latin of the Roman era. Studies in comparative linguistics also include studying distant languages, such as Sanskrit and German that are separated by thousands of kilometres and years, but which nevertheless have structural and etymological similarities.

5.Historical linguistics studies the evolution and changes in languages through periods of time. It analyses how and in what ways language changes over time, and also involves the reconstruction of past forms of languages. It is also the study of how languages change over time, addressing such questions as why modern English is different form Old English and Middle English or what it means to say that English and German are “more closely related” to each other than English and French.

6.Stylistics deals with the study and interpretation of style and tones in both written and spoken language. It involves the analysis of different features of style, including but not limited to the use of symbolism, dialogues, regional accents, rhyme, sentence structure etc.

7.Applied linguistics is a branch of linguistics concerned with the application of linguistic theories, methods, and findings to the investigation of language problems that have occurred in other fields of study.This includes investigating how people learn second languages, how to teach languages more effectively, how to use technology to support language learning, how to develop materials for language teaching, and how to assess language skills.There are four major branches of applied linguistics: sociolinguistics, psycholinguistics, neurolinguistics, and discourse analysis. Each of these branches investigates a different aspect of language and its use.

- Sociolinguistics looks at the way language is used in different social contexts, and how language use varies according to factors such as class, gender, and ethnicity.
- Psycholinguistics investigates the psychological processes involved in language use, such as how we learn and remember words, and how we produce and understand speech. -

- Neurolinguistics looks at the brain mechanisms underlying language use, and how language impairments can arise as a result of brain damage.
- Discourse analysis investigates the structure and meaning of texts, and how texts are used in real-world contexts.

Let 's also have a look at the hierarchy of language and how smaller units come together to form bigger, more complex structures of a language.

1.Phonemes - These are the smallest units of language that distinguish one word from another. For instance, the letters s, d, w, and b in the words say, day, way, and bay are phonetic elements.

2.Syllables - A word or part of a word that contains one vowel sound. For instance, the word day has one syllable, while daily has two syllables.

3.Morphemes - A morpheme is the smallest unit of meaning that a word in a language can be divided into. For instance, the word unreasonable can be divided into three sections - un-, reason, and -able.

4.Words - A word is defined as the smallest sequence of phonemes that can stand on its own. Contrast this with morphemes that do not stand on their own. For instance, the word management can stand on its own as an entity in language, but its constituent morpheme ‘-ment’ cannot.

5.Phrases - Any group of words that are used together without a full verb is called a phrase. Phrases can be just a single word or a complete sentence but do not include the subject-verb pairing. For instance, “under the bed”, “a box of chocolates”, “in the air” are examples of phrases.

6.Clauses - A clause is a group of words that has a subject and a verb. For instance, “Rahul swims fast” is a clause.

7.Sentences - Sentences are groups of words that express a complete thought. They’re similar to clauses but have a more thorough statement to make. “Rahul swims fast but not as fast as Samar” is a sentence that consists of two clauses separated by a ‘but’.

8.Texts - Finally, a text is a coherent sequence of sentences, be it spoken or written, that is up for critical analysis and interpretation. Texts can be classified by genre or type, such as poems, essays, books, news, conversations, etc.

This is the basic hierarchical structure of a language. Although we've used English as an example, this is true for most languages of the world.

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CONCEPTS ABOUT THE SOURCE OF THE WORD “CONSTITUTION” AND ITS MODERN MEANING

Khalilov Yunis
Senior lecturer of the chair “Legal studies”, Nakhcivan State University, Azerbaijan, Orcid İD: 0009-0004-3521-1913

Abstract

The article explains the origin and modern meaning of the word "constitution". It is noted that the word "Constitution" was used for the first time in Ancient Rome to express the unified name of separate acts of the imperial power. This word, which is written as "constitutio" in Latin, is expressed as "constitution" in English and French, "constituzione" in Italian, "constitucion" in Spanish, "konstitucia" in Russian, and "constitution" in Azerbaijani. That word is a noun derived from the French verb "constituer" meaning "to arise", "to organize", "to bring about", "to establish", "to establish", "to establish". The author reviews the opinions of lawyers-scientists on the subject, and makes considerations about other similar terms that correspond to the meaning of the concept of "constitution".

Key words: Constitution, Ancient Rome, Roman law, organize, establish

The word "Constitution" was used for the first time in Ancient Rome to express the unified name of individual acts of the imperial power [7, p. 39]. At that time, this word was used to express not the basic structure of the state, but the emperor's special activities and orders [11, p. 12]. Thus, in Ancient Rome, the following four types of imperial decrees called "constitutions" were distinguished: a) edicts; b) rescripts; c) mandates; d) decrees [10, p. 20-21].

In the first half of V century AD, the first official codification was carried out in Ancient Rome, "Codex Theodosianus" - Feodosi's Code, which contained and systematized all existing constitutions starting from Emperor Feodosi II Constantine, was published. The Code was divided into 16 books, and the books were divided into titles where individual constitutions were placed in chronological order. It was after the publication of that code that the constitutions were named "Feodosi's Novellas" [10, p. 32]. Apparently, the word "constitution" used to have a different meaning than it has today. This word written as Latin "constitutio" is expressed as "constitution" in English and French, "constituzione" in Italian, "constitución" in Spanish, "constituição" in Portuguese, "конституция" in Russian, "konstitutsiya" in Uzbek, "konstitutsiya" in Azerbaijani. That word is a noun derived from the French verb "constituer", which means "to arise", "to organize", "to bring about", "to establish", "to found" [13]. It is no coincidence that Petit Robert, one of the French authors, distinguished three meanings of the word "constitution" in a broad sense: 1. Building work, activity (action d'establire); 2. The way of emergece of something (manière dont une chose est composée); 3. An activity of generating a whole (action de constituer un ensemble) [12]. Based on this logic, the word "constitution" should be understood in Azerbaijani language as "creation", "organization", "establishment", "foundation". The French verb "constituer" gives the Latin meanings "to put", "to place", "to bring forth", "to establish". The verb "constituer" is derived from the Latin preposition "com" and the verb "statuere". "Com" ("Cum") is a Latin preposition meaning "partnership", "together". The verb "Statuere" comes from the root of the word "sta" in the Indo-European family of languages and means "to put", "to place", "to organize", "to stabilize", "to stop".

The word "constitution", which is used as a legal term in modern times, is used in the sense of the supreme legislative act of the state, which has the highest and direct legal force, and this act, in addition to regulating the most important relations related to the personality, society and the state, determines the constitutional structure of the state, the people's power and the foundations of the state. , as well as reflects the economic, political, social, legal, ideological and moral characteristics of the country. In addition, the constitutions of the world states determine the principles of the organization and operation of state bodies, the main provisions of state power and state administration, the system of judicial power, the rights and freedoms of citizens, public organizations, associations, and various institutions [9, p. 621]. The meaning of this legal term is given in the "Explanatory dictionary of the Azerbaijani language" as follows: "CONSTITUTION (lat. Constitutio - structure). The basic law of a state that defines the social and state structure, electoral system, principles of activity and organization of state bodies, basic rights and duties of citizens..." [2, p. 92].

From this point of view, the legal literature rightly says: "The Constitution establishes the foundations of the existing socio-political system in a country and, if it is somewhat figurative, determines the "rules of the game of the political scene". The Constitution defines the civilized and generally accepted way of obtaining power, the principles and goals, methods of distribution of power among social subjects. The constitution determines the basis of the legal status of all members of the society and thereby draws the general contours of the relations between the state and the individual" [6, p. 55].

The first constitution in the world was adopted in 1787 in the United States. The chronological order of the constitutions adopted later is as follows: France (1791), Sweden (1809), Spain (1812), Norway (1814), Belgium (1831), Switzerland (1848), Italy (1848), Prussia (1848) - 1850), Denmark (1849), Luxembourg (1849), Greece (1864), Romania (1866), Ottoman Empire (1876), Netherlands (1887), Japan (1889), etc. As for the Republic of Azerbaijan, the constitution was adopted in the following years in the history of our country: 1921, 1925, 1937, 1978 and 1995 [4, p. 4].

In some states, the word "constitution" is synonymous with terms like "legal basis", "Organizational Law", "Constitution", "Basic Law", etc. For example, the first constitution of the Ottoman Empire dated 1876 was called "Kanunu Esâsî". According to the Turkish lawyer Tarık Zafer Tuna, the proposal of the word "Kanunu Esâsî" as a counterpart to the French word "constitution" was first proposed by Sadrıazam Mehmet Sait Pasha. "Esâsî" means "true", "related to the basis" [8]. It can be concluded from here that "Kanunu Esâsî" means "Original law", "Fundamental law", so this term fully reflects the modern meaning of the word "constitution".

The 1921 constitution of Turkey was named "Teşkilât-ı Esâsiyye Kanunu". In 1924, the name of the Turkish constitution was kept as "Teşkilât-ı Esâsiyye Kanunu". On January 10, 1945, a new constitution of Turkey called "Anayasa" was adopted instead of "Teşkilât-i Esâsiyye Kanunu", in 1952 the name "Anayasa" was changed and the old name (Teşkilât-i Esâsiyye Kanunu) was restored, finally in 1961 and the Turkish constitutions of 1982 were again named "Constitution".

The expression "Teşkilât-ı Esâsiyye Kanunu" is more similar to the French word "constitution" than the term "Kanunu Esâsî". Above, the word "constitution" means "to appear", "to establish", "to found", etc. We have mentioned that it is correct to translate according to words that express similar meanings. This word corresponds to the Turkish meanings of "formation" and "establishment". In this regard, the Turkish word "organization" of the 1920s is the most fully translated version of the word "constitution". Most likely, the word "Esâsiyye" was added to the name of the Turkish constitution dated 1921 to distinguish it from the word "organization", which means "legal entity", and thus the expression "Teşkilât-ı Esâsiyye" entered the lexicon. This new expression means "essential organization", "basic organization", "main organization" in modern Turkish. The word "law" was added to the expression "Teshkilât-ı Esâsiyye" dated 1921, as a result

the constitution was named "Teshkilât-i Esâsiyye Kanunu". For comparison, let's note that the French word "constitution" and the word "loi" meaning "law" were combined to form "loi constitutionnelle", i.e. "Basic law".

Sometimes, illegal actions which seem to be legal can be condemned according to constitution such as recording somebody's voice and introducing it as a proof in the court. The author, Yunis Khalilov underlines it in his study: "However, we believe that the Court could have determined that the illegally obtained evidence was inadmissible, at least from the standpoint that it violated the constitutional rights of the accused" [14, p.24].

As for the term "Constitution", it is a compound word formed from the combination of the words "mother" and "law". In Turkish, "yasa" means "law" [1, p. 425]. "Mother" means "female who gives birth to a child", as is known. In this sense, "constitution" means "mother of laws", "mother who gives birth to laws".

According to Bulent Nuri Esen, the term "constitution" was first used by Osman Nuri Uman, who taught "Esâs Teşkilât hukuku" at the Gendarmerie Officer School in the 1930s [3, p. 34].

In some countries, the term "Basic Law" is used instead of the term constitution. For example, the German Constitution is called the Basic Law. In Australia, the constitution is called "Union Constitution Law", and in Colombia it is called "Political Constitution" [5, p. 34].

From what has been said, it is clear that the "constitution", whose origins go back to Ancient Roman law and which at that time did not express the basic structure of the state, but the special activities and orders of the emperor, passed a long historical path and was named differently in different states, and in modern times it is the name of the supreme legislative act adopted by almost most countries of the world.

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Culturology

Мәдени ландшафттың әлеуметтік-мәдени категория ретіндегі әлеуметтік құрылысы мен инновациялық моделі

Байсарина Жазира Сламкуловна
PhD, ассистент-профессор, Astana IT University, Астана қ.
Кішкенбаева Жұлдызай Қалыбекқызы
Ph.D, Л.Н. Гумилев атындағы ЕҰУ «Ел тарихы»,ҒЗО бас ғылыми қызметкері, Астана қ.

Аңдатпа

Бұл мақалада мәдени ландшафт ұғымы, оның қоғамда қабылдануы мен маңызы зерттеледі. Қазақстанның сакральды географияларының бірегейі - Түркістан және Ұлытау мәдени ландшафтылары нысанаға алынды. Жергілікті тұрғындар мен туристердің қоршаған ортаны қабылдауы мен репрезентативті моделіне назар бөлінеді. Нәтижесінде, мәдени ландшафт есте сақтау және иелік ету орны ретінде адамдар тамашалайтын ландшафт қана емес, сонымен қатар өз тұжырымдары, негізгі білімді, көне тәжірибелерді және сезімдерімен байланысты әлеуметтік құрылыс ретінде айғақтай келе, этнотуристік индустрияны дамыту арқылы жергілікті экономикаға түсетін кірістер ел ішіндегі жұмыссыздықты азайтуға ықпал ететіндігі тұжырымдалады.

Кілт сөздер: ландшафт, мәдени ландшафт, экотуризм, этнографиялық туризм, шығармашылық туризм индустриясы, тарихи-мәдени туризм

Abstract

This article examines the concept of cultural landscape, its perception and importance in society. The cultural landscapes of Turkestan and Ulytau, which are unique among sacred geographies of Kazakhstan, were targeted in it. The main focus is paid to the perception and representative model of the local residents and tourists. As a result, the cultural landscape is not only a landscape that people enjoy to visit as a place of memory and ownership, but also a social construction associated with its findings, basic knowledge, ancient practices and feelings. It is also stated that the income which flows into the local economy through the development of the ethnotourism industry can affect onto the contribution of the reduction of unemployment within the country.

Key words: landscape, cultural landscape, ecotourism, ethnographic tourism, creative tourism industry, historical and cultural tourism

Кіріспе

Қазіргі таңда урбанизация мен өнеркәсіптік даму процестерінің қарқынды дамуы мәдени ландшафт мәселесіне жергілікті, аймақтық және жаһандық көлемде жағымсыз өзгерістерді тудыруда [1]. Оған әртүрлілік пен эстетикалық сапаның жоғалуын, табиғи ортаның өзгеруін, ондағы тұрғындар (жеке және әлеуметтік топтар) үшін бірегейлік пен маңыздылықтың өзгеруін және т.б. жатқызамыз [2]. Осы тұрғыда, әртүрлі субъектілердің ландшафтқа деген қарым-қатынасы, оны қабылдаудағы рөлі, кеңістіктегі мінез-құлқы қазіргі ландшафттық зерттеулерге қызығушылықты арттыруда [3], [4]. Сол себепті, бүгінгі ландшафттық зерттеулер белгілі бір мекен тұрғындары үшін тұрақты ортаның дамуын қолдауға бағытталғандықтан, тұрғындардың қоршаған ортаны қабылдауы мен интерпретациясы үлкен маңызға ие болуда [5], [6], [7].

Зерттеуші Бэллдің айтуынша «Ландшафтты қабылдау мен интерпретациялау бойынша бірқатар зерттеулер, көбінесе, Еуропа мен Америка Құрама Штаттарына бағытталған, ал посткеңестік елдердегі ландшафт мәселелеріне арналған зерттеулер жоқтың қасы» [8]. Осы тұжырым аясында шетелдік зерттеуші Приего: «Кейінгі жылдары мәдениетаралық зерттеулердің маңыздылығын мойындау артып келе жатқанымен, әртүрлі жаһандық контексттердегі әртүрлі топтардың ландшафтты қабылдауындағы айырмашылықтары мен ұқсастықтары сирек зерттеледі» деген тұжырым жасаған [9]. Шын мәнісінде, ландшафтты қабылдаудағы мұндай айырмашылықтар әртүрлі әлеуметтік және мәдени ортасы бар адамдар арасында төмендегі факторлар арқылы анықталуы мүмкін: жасы, этникалық тегі, тұрғылықты жері (қалалық немесе ауылдық, тұрғындар немесе туристер), жынысы, білімі, кәсібі және т.б.

Әртүрлі контекстердегі адамдар түсінетін әртүрлі шындықтарды және олардың ландшафтты көру және түсіндіру тәсілдерін түсіну, әсіресе жаһандық экологиялық өзгерістер жағдайында өте маңызды және өз кезегінде, халықаралық қауымдастықтардың ынтымақтастығын талап етеді.

Жұмыстың мақсаты әртүрлі мәдени топтардың (жергілікті және туристер) ландшафт ұғымын қалай қабылдайтынын және олардың өткен және қазіргі аймақтық тәжірибелер нәтижесінде экологиялық және әлеуметтік өзгерістерін зерттеу. Бұл бағыт отандық және шетелдік мәдени топтардың кейстері негізінде келесі сұрақтарды шешуге тырысады:

а) Әртүрлі топтар арасындағы ланфшафтты қабылдауда қандай айырмашылықтар мен ұқсастықтарды табуға болады?

ә) Әртүрлі мәдениет өкілдері ландшафтты қалай құрастырады, қарым- қатынастары қандай және ландшафттағы өзгерістерді қалай түсіндіреді?

Зерттеудің әдісі ретінде, өңірлік сарапшылармен, туристермен, сондай-ақ аймақты егжей-тегжейлі білетін тұрғындармен жартылай құрылымдық сұхбаттарды пайдалана отырып, әлеуметтік құрылыс ретінде ландшафт ұғымына және оны қабылдау мен түсіндірудің әртүрлі тәсілдеріне назар аударылды.

Этнотуристік мекендер (Түркістан, Ұлытау) табиғи ортасы бай аймақтарда орналасқандықтан және әлеуметтік-мәдени алуан түрлілігі сақталғандықтан кейс ретінде таңдалды. Мәдени ландшафттардың алуан түрлілігі әрбір нақты жағдайда тарихи ерекшеліктермен анықталады. Екі аймақ та тарихи-мәдени туризмнің ірі орталықтары ретінде маңызды рөл атқарады. Сонымен қатар аймақтардың нақты және болашақтағы дамуы мен экономикалық жаңғыруы үшін бұл өңірлердің шешуші маңызы бар. Аталған киелі мекендер мәдени мұраны сақтау үшін ЮНЕСКО-ның Бүкіләлемдік мұра тізіміне енген маңызды ландшафттар ретінде мойындалды: Түркістан – ежелгі түріктердің көне дәстүрлері сақталған рухани мәдениетімен, ерекше сәулет өнерімен сақталған ерекше мекен болса, Ұлытау – ежелгі қоныстарды, бекіністерді, мұнараларды, қорғандарды, кесенелерді және жартастағы

суреттерді қоса алғанда, маңызды рөл атқарған әлеуетті мұра нысаны. Олардың барлығы адамның мәдени мұра нысандарының айналасындағы табиғи ортамен көрнекті қарым-қатынасының әртүрлі кезеңдерін білдіреді. Кейінгі кезеңде бұл өзара әрекеттесу жергілікті қауымдастықтардың жергілікті мәдени мұра нысандарын, әсіресе ежелгі билеушілердің жерлеулерін және қоршаған табиғи ландшафттарды киелі ету түрінде болды. Жалпы алғанда, олар адамның жергілікті табиғи ландшафтпен өзара әрекеттесуінің тамаша куәсі болып табылады.
Сонымен қатар туристік индустрияны дамыту мақсатында жергілікті тұрғындарды да, шетелдік этнотуристерді де тарту үшін кеңінен танымалдылығының ықтималдылығы әртүрлі табиғи және тарихи-мәдени ресурстардың даму динамикасына қатысты.

Зерттеу әдістері

Зерттеу әдістері ландшафт морфологиясы мен феноменологиясы бойынша әртүрлі зерттеулерден алынған [3], [10], пейзажды қабылдау [11] және ландшафттың әлеуметтік құрылымы [12]. Сонымен қатар, ландшафтты қабылдау бойынша ұлтаралық салыстырмалы зерттеулердің тәсілдері мен тұжырымдары қарастырылды [9], [13]. Сондай-ақ, жеке конструкциялау теориясы және мекен теориясына негізделген, ландшафтты қабылдау мен құндылықтар физикалық әлем, іс-әрекеттер мен жеке адамның қабылдауының өзара әрекеттесуіне байланысты жеке түрде әртүрлі құрылуы мүмкін деп мәлімделді.
Жалпы объективті сұрақтарға жауап беру үшін отандық және басқа да шетелдік географиялық зерттеулерде мәдени ландшафттың жарияланған анықтамаларын талдау арқылы концептуалды контекст құру болды.

Талдау және нәтижелері

Бұл зерттеу, біріншіден, ландшафтты әлеуметтік құрылыс ретінде түсіндіруді ұсынады, екіншіден, жеке құрылыс ретіндегі ландшафтыға қатысты мәселе, атап айтқанда, сезім арқылы қабылдау (жердің иісі, қала дыбысы, үнсіз кеңістік) және есте сақтаудың әсері сияқты аспектілерді анықтау керек. Сондай-ақ әрбір мәдени топтың ландшафттық өзгерістер туралы жалпы білімдері анықталып, олардан осы өзгерістердің ең маңызды белгілерін және олардың қарапайым тұрғындардың өміріне тигізетін әсерін анықтау мен дамыту гипотезасын беру көзделді.

Ландшафт әлеуметтік құрылыс ретінде

Қазіргі кезге дейін жергілікті немесе батыстық код ретінде ландшафт ұғымының семантикалық тұжырымдары мен стереотиптері қалыптасқан.
Сұхбаттық зерттеу әдістері нәтижесінде, Түркістан сакральды мекені - қыс мезгілі жылы, әрі қысқа кең даламен, шексіз жолдармен және зәулім кесенелермен байланыстырылады. Ұлытаудың типтік белгілері ретінде Еуразияның орталық бөлігінде бірнеше көшпелі мәдениеттердің қалыптасу аймағы болғандығы, Моңғол шапқыншылығынан кейін Ұлытау Шыңғыс хан ұрпақтары мен Алтын Орда билеушілерінің қорымына, қазақ хандарының саяси орталығына айналғандығы және XX ғасырдың басынан бүгінге дейін көрнекті тарихи және әулие тұлғалардың Ұлытау қорымдары зиярат нысаны болып табылатындығы мәлімделді.
Осыған жақын немесе ұқсас түсініктер мен аналогтарды басқа аймақтарда кездестіруге болатыны сөзсіз, бірақ тарихи-мәдени даралық сипатына байланысты бұл белгілер ұлттық ландшафттық кодқа айналды. Мұның бәрі туристердің ландшафтты жалпы қабылдауы болды.

Физикалық тұрғыда ешқашан барып көрмеген мекендерді қабылдауға жалпы ақпараттың әсері көбінесе жат пейзажды идеализациялау аспектілерінде көрінетіндігі дәлелденді: «Түркістан немесе Ұлытау - тарихи мәдени құндылықтарға саяхат мекендері болумен қатар, әртүрлі экологиялық мәселелерге толы мекендер» (Сұхбат нәтижесі).
Бұл жағдайда адамдардың қабылдауына ықпал еткен дүние, ол - олар барған жерлер туралы ресми немесе ойдан шығарылған дереккөздерден оқып - білген білімдері. Ауылдық немесе қалалық мәдени ландшафтты тек туған елде ғана емес, сонымен қатар саяхатшылармен де, табиғатпен де, мәдениетпен де қарқынды диалог ретінде қарастыруға болады. Ол әртүрлі стереотиптерді бұзуға ықпал етеді. Мысалы, «Мен үнемі экологиялық жағдайға ұшыраған ен дала ретінде ойладым» (Сұхбат нәтижесі).
Сондай-ақ, сұхбаттасушылардан ландшафт туралы ойлаған кезде ойларына келген негізгі ассоциацияларды (сөздер немесе сөз тіркестері) беру сұралды. Нәтижесінде, ландшафтты табиғаттың бір бөлігі, табиғилық, рекреация, экотуристік (материалдық аспект) ретінде түсінетіндіктері анықталды. Олар туристік индустрияны дамытуда әлеуметтік құрылыс бола алатын, сол арқылы жергілікті экономикаға түсетін кірістер ел ішіндегі жұмыссыздықты азайту мәселелерін шешуге ықпал ететін құрал деп түсіндірді.

Ландшафт жеке құрылыс ретінде

Ландшафттың көрнекі элементтері және оларды табиғи сұлулық ретінде қабылдау басқалармен тығыз байланысты сенсорлық ерекшеліктерден тұрады, Мысалы, батыс зерттеушісі М. Скрамның айтуынша, шықылықтаған құстардың дыбысы тыныштық пен рақаттану сезімін білдіреді [14]. Осылайша, дала иісі немесе қазақ дүниетанымында жусан иісі, ландшафтпен байланысты материалдық қасиет тудыруы мүмкін. Мысалы, «Егер сіз жусан иісі аңқыған жазық далада болсаңыз, оның сұлулығы мен көңіл-күйін ғана емес, оның табиғатпен біте қайнасқан иісін де сезінгендей боласыз» (Сұхбат нәтижесі).
Көптеген жергілікті адамдар тарихи орындарға туған жерлеріне саяхаттау немесе ата-бабалары өмір сүрген жерді зерттеу мақсатында баратындығы анықталды. Сондықтан да, этнотуризм – туристердің өзге халықтардың тарихымен, мәдени мұрасымен танысудың, олардың ата-бабаларының шығу тегі туралы білудің және олардың тамырын іздеудің тамаша тәсілі болмақ.

Қорытынды

Зерттеуде әртүрлі мәдени топтардың мәдени ландшафтты қабылдауын және ландшафттың әлеуметтік құрылысы үдерісін түсіндіру ұсынылды.
Адамдар кез келген ландшафтқа қарағанда тек табиғи ерекшеліктерді көріп қана қоймайды, сонымен қатар, құбылыстарды жүйелеуге және қабылдауға, ондағы ең маңызды белгілерді немесе объектілерді бағалау және оларды белгілі бір ретпен қоюға тырысады.
Зерттеу нәтижелері көрсеткендей, әрбір жеке тұлғаның мәдени ландшафт идеяларын қолдайтын естеліктер, жеке тәжірибе, саяхат, білім және т.б. арқылы қалыптасатындығы анықталды.
Мәдени ландшафт өз елінің маңызды аспектісі ретінде жергілікті тұрғындар үшін ерекше өзіндік сезім, туған жер сияқты психикалық элементтермен берілсе, туристер үшін жеке мақсаттар, саяхат, танысу, зерттеу, аймақтың негізгі бағдары, өзіндік тарихи-мәдени орны мен жадысы бар, табиғилық немесе табиғат туралы адамдардың бағалауы.
Зерттеу нәтижелері бойынша зерттелген киелі мекендер өз елінің бірегей бренді, экономикалық, институционалдық және әлеуметтік дамуын тұрақты түрде жалғастыруды қажет ететін, мәдени ландшафттардың әлеуетін пайдалану және жаһандық қарсыластарға

қарсы тұру үшін аймақтың бағдары бола алатындығы, оның әртүрлі қасиеттілігі мен жерді пайдалану учаскесі ғана емес, өзінің бай тарихи, мәдени және табиғи мозаикасы, сондай-ақ әлеуеті бар тірі организмі екені айғақталды. Ландшафтты зерттеу адамдар өздері мекендейтін жерге қарай тек карталарды, жоспарларды, қабылдауларды қамтитын процесс емес, сонымен қатар ландшафттың тұжырымына қатысты білімді қайта қарастыру процесі деп болжанады. Қорыта келе, аталмыш тарихи мәдени ландшафттар инновациялық этнотуризмді дамыту үшін үлкен туристік әлеуеті бар орындар. Ондағы тарихи ескерткіштер, мәдени мұра және табиғи ландшафт басты факторлар болып табылады және түрлі этнотуристік рекреациялық аймақты ұйымдастыруға мүмкіндік береді. Сондықтан, туристер мен инвесторлар үшін отандық туристік бағыттардың тартымдылығын арттыру бойынша іргелі жүйелі және кешенді шараларды қолдану қажет.

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Training Modern Puppeteer Actors within the Higher Education System

Anar Yeshmuratova
Senior Lecturer, PhD, Kazakh National University of Arts, Astana, Kazakhstan

Sociocultural transformations related to Kazakhstan's integration into the international community, the development of international relations in various fields, and the informatization of society necessitate the need for qualified specialists. These professionals should contribute to the development of spiritual values, preservation of national traditions, and address aesthetic, moral-ethical, and psychological issues of the modern era. In this context, theatrical art, particularly puppet theater, becomes crucial in finding successful solutions to these challenges.

The professional development of modern puppeteer actors and the formation of their personal mastery is a significant topic of dialogue among theorists and practitioners in puppet theater.

Every field of human activity requires specific skills and competencies, directly achieved through the refinement of performance techniques. Thus, the mastery of puppeteer actors becomes effective through the understanding of the laws of contemporary puppet theater art, which are embodied in the study of puppeteer acting techniques. As specialists, puppeteer actors, who embody the specifics of the theater, demonstrate their professional competence through their abilities and skills acquired during university training.

The mentioned requires the educational process to be oriented towards creating optimal organizational and pedagogical conditions for the development of future specialists capable of solving a broad spectrum of creative professional tasks.

The relevance of this topic is conditioned by several existing contradictions:

- the necessity of modernizing the educational process in art universities and the predominance of traditional forms and means of professional training;

- the importance of considering the activation of specific directions in the training of puppeteer actors (stage movement, dance, vocal, etc.) considering the increased hours in educational programs;

- insufficient scientific and methodological support for the theoretical training of puppeteer actors, particularly in the technological basics of puppet creation, which is the primary tool of a puppeteer actor.

At the beginning of the new 21st century, higher theatrical education in Kazakhstan offers a wide range of creative directions and specializations, among which the specialization "Puppet Theater Actor" in the "Theatrical Art" direction attracts significant interest from applicants, creating large annual competitions among them. At the Kazakh National University of Arts (Astana), students of the mentioned specialization receive high-quality, comprehensive education under the guidance of well-known and talented faculty members of the "Art of Musical-Dramatic and Puppet Theater" department.

Analysis of regulatory documents showed that the curricula and educational programs for the professional training of puppeteer actors include disciplines and educational material aimed at preparing students for various aspects of professional activity.

At the department, puppeteer students master specialized disciplines such as "Puppet Manipulation," "Hand Plastics," "Acting Mastery of Puppet Theater," "Direction," "Stage Movement," "Stage Speech," "Vocal," "Dance."

From the above, the specificity and at the same time the complexity of the professional training of puppeteer actors are evident, which consists in educating a versatile actor who has mastered both dramatic and musical-vocal, and plastic arts at a proper level, in accordance with the needs of contemporary puppet theater art.

At the same time, as practice shows, despite the developed educational program for training future puppeteer actors, there is a severe shortage of teaching hours for disciplines such as "Stage Movement," "Vocal," "Dance," which are the basis for preparing a highly professional specialist.

It is worth noting that one of the main tasks of the professional school for training future puppet theater actors is to master practical skills and develop abilities to convey their inner sensations directly through the hand or artistic tool. An actor may be behind a screen or in an "open" reception, but the process of transmitting the psychophysical nature of a person through a puppet is common to all types of puppet systems.

The art of puppet manipulation consists of the puppet in the puppeteer's hands meaningfully and sequentially reproducing a series of dynamic and static poses characteristic of a particular character. Building sculptural mise-en-scenes and plastic dialogues also requires mastering "microscopic" plastics. "Microplastics" convinces the audience of the presence of the character's inner monologue and the puppet actor's constant "living" on stage. The staged action of the puppet includes the alternation of movement and its expressive posture. Gradually, through regular training, students in practice study the possibilities of the "body" of the puppet - its torso, head, hands, "legs," and begin to use them freely in staged action. "The work of a puppet theater actor is manual labor involving controlling and shaping actions of the hands, and at the same time, it is a high art, which becomes such only under the condition of virtuosic mastery of puppet manipulation techniques".

One of the foundations of the mastery of a puppeteer actor is the mastery of plastics, primarily of one's body, allowing one to coexist organically on stage. Dance, as an important component of the expressive means system of the puppet theater, plays a significant role in this process. Dance and plastic training of a puppeteer actor, therefore, is a necessary professional quality, underscoring the importance of studying various manifestations of choreography in the general stage space.

Practical familiarization with the art of dance involves the study of a complex of educational disciplines of the corresponding direction. The main subjects of the choreographic cycle - "Stage Movement," "Dance," "Rhythmics" - which traditionally are an integral part of the system of theatrical education, covering different types of "art of movement" and addressing the tasks of harmonious development of the body and acquisition of special skills.

In conjunction with such educational disciplines as "Acting Mastery," "Stage Speech," "Vocal," they lay the foundations of the dance-plastic culture of students of theatrical faculties of art universities.

The cycle of "plastic" disciplines forms among puppeteer students a complex of basic choreographic skills and special motor skills, namely: develops danceability, a sense of rhythm, coordination of movements, stage movement, and generally promotes overall physical preparation. Each of the disciplines of the choreographic cycle has its specific tasks, and at the same time, all of them are aimed at achieving a single goal: to provide comprehensive training for puppeteer students in the field of movement, to develop their psychomotor qualities, and to form the expressiveness of movement overall.

Stage movement remains always relevant in the professional activity of a puppeteer actor. Without the basics of stage movement, the development of acting mastery is impossible. To form a plastic-expressive image, it is necessary that the body be specially prepared, which will give the puppeteer actor such external technique, with which he can easily and correctly perform any

movements. The external technique, with the presence of creative talent, is always capable of creating a high stage result. In professional activity, a puppeteer actor faces the need to thoroughly study and understand his bodily nature, which he possesses until he begins stage work. He must know the possibilities of full use of his body for expressive stage action. This is especially important for young puppeteer actors, who are just stepping onto the path of creative and professional realization, since without constant, many-hour work on improving their physical form and mastering the art of stage movement, it is impossible to achieve a high level of mastery.

One direction in the training of puppeteer students is vocal mastery. Undoubtedly, the voice is a gift of nature, but it also requires constant perfection, especially in view of the specificity of the profession of a puppeteer actor. In the process of training during vocal lessons, the vocal apparatus is tuned like a musical instrument, which resonates in a person. When mastering vocal mastery, it is important to work not only on the vocal natural data but also on oneself: on one's own psyche, inner emotional mood, intellectual level, etc. Since the process of forming vocal skills involves not only the vocal apparatus but also the person as a whole (the skeletal-muscular complex of the body, the motor-movement system, changes in which reflect the psycho-emotional state of the personality). Speransky E.V. wrote: "Voice and speech in the puppet theater acquire much greater significance than in the theater of man".

It should also be emphasized that music and vocals are able to lead the student-puppeteer by a short path to understanding the specifics of the artistic image of the play as a whole and the hero in particular.

The ability to feel and understand the musical fabric of the play is very important for future puppeteer actors, as today there are practically no puppet plays in which "live" singing does not sound. In this case, the performer of musical numbers is similar to the director, since a song is a small play where it is necessary to choose one's own concept to reveal the main idea of the play using the means of musical expressiveness. At the same time, the artistry of a puppeteer actor is paramount for full immersion in the role, and the vocal component serves as a tool in achieving the set goal. The vocal part of a puppeteer actor is always the culmination of the plastic action, which helps the actor reveal and convey the overall idea of the play.

A pressing problem in the training of puppeteer students is also the lack of professional puppet makers, who could, within the framework of the special educational discipline "Technology of Manufacturing Theatrical Puppets," not only expand students' understanding of the technological basics of creating a mechanized puppet but also help them master practical skills in its creation (construction, mechanics, etc.) with their own hands. Indeed, "In a puppet play, it is precisely the puppet that is the artistic tool through which the ideological and emotional content of the play becomes the property of the audience. The more perfect this tool, the richer, more diverse, and more expressive the means of the puppet and the more virtuosic the artist controls the puppet, the fuller and deeper the content of the play is revealed to the audience".

The addition of the substantive component of the professional training of future puppeteer actors with the help of mastering practical skills in creating a mechanized puppet can contribute to the effective comprehensive education of students in conditions:

- development and implementation of an author's methodology for studying the technology of creating a theatrical mechanized puppet;
- creation of an educational-methodical complex for implementing the author's methodology in higher educational institutions of artistic direction;
- involving puppeteer students in various activities to study the technological basics of creating a theatrical puppet;
- forming the need and skills to use the acquired knowledge in future professional activities.

Kalmanovsky E.S. wrote that "...a puppet is any object that is involved in the circle of meaningful human, human associations and participates in scenic creativity".

Thus, the outlined range of key directions in the professional training of a modern puppeteer actor within the educational process at a university once again confirms the fact of the universality of a puppeteer actor.

The development and substantiation of effective interdisciplinary interaction (taking into account a sufficient number of teaching hours for mastering many skills and abilities) in the process of professional training of future puppeteer actors within higher education is an important pedagogical condition for forming their performing mastery.

The essence of the theater is the meeting of the actor and the audience. The essence of the puppet theater is the meeting of three partners: the actor, the audience, and the puppet. And it does not matter whether the audience sees the actor or he is hidden behind a screen. Modern puppet theater, like a century ago, is focused on the puppet. But much more on animating dead matter than on telling stories. At the center is the puppet artist, who addresses the plastic form to articulate the meaning of what he wants to express. It is his vision, understanding based on professionalism, that becomes decisive in the microcosm of the staged action created. The modern puppeteer actor "gives birth" to an artistic-aesthetic program, forming new acting techniques, forms, and methods of conveying the main essence of the entire play.

Biological Sciences

ДИНАМИКА ИЗМЕНЕНИЯ МАССЫ ТЕЛА КРЫС, ПРЕНАТАЛЬНО РАЗВИВШИХСЯ В УСЛОВИЯХ ГИПОКИНЕЗИИ МАТЕРЕЙ

МАХМУДОВА НАРГИЗ ШАИК

Д.ф.б., с.н.с Министерство Науки и Образования Институт Физиологии им. академика Абдуллы Гараева, Баку, Азербайджан

ГАДЖИЕВА ГЮНАЙ ШЮКЮР

М.н.с. Министерство Науки и Образования Институт Физиологии им. академика Абдуллы Гараева, Баку, Азербайджан

Ограничение двигательной активности приводит к различным и множественным изменениям в развивающимся организме.

Целью наших исследований было изучение изменений биометрического показателя крыс в ранний период постнатального развития. Эксперименты проводились на 3-х месячных беспородных белых крысах линии Вистар, выращенных в виварных условиях института физиологии. В работе было использовано потомство в количестве 60 животных (22 контрольных и 38 экспериментальных), полученных от 25 матерей (4 контрольных и 21 экспериментальных). Контрольная группа животных в течение всей беременности содержалась в нормальных условиях в металлических клетках размерами 50х30х30 см по 2-3 особи в каждой. Для создания условия гипокинезии были сконструированы специальные клетки размером 14х8х20 см, в которые помещались беременные самки по одной особи в каждую. Гипокинезия беременных самок крыс создавалась в трех периодах онтогенеза: в зародышевый (E_0-E_7), в предплодный (E_8-E_{14}) и плодный (E_{15}-E_{21}) периоды.

У 3-х месячных контрольных крыс средний вес тела составлял 158,6±17,9г. Экспериментальные животные того же возраста в среднем весили: в зародышевый период в 121,6±11,5г, в предплодный период - 94,0±3,4г и в плодный период - 140,6±12,8г. Результаты исследований показали, что все критические периоды антенатального развития более или менее чувствительны к неблагоприятным воздействиям условий гипокинезии.

Таким образом было выявлено, что гипокинезия вызывает существенное снижение в массе тела развивающегося в условиях фактора стресса организма. При этом обнаружено, что наибольшая разница в весе наблюдалась у потомства, подверженных воздействию фактора в предплодный период.

STUDY OF PROPERTIES OF RECOMBINANT ANTIGENS OF *SALMONELLA ABORTUS EQUI*

Suleimanova Nargiza Sunnatikyzy
Master's student of the 2nd year, S. Seifullin Kazakh Agrotechnical Research University
Borovikov Sergey Nikolaevich
Candidate of Biological Sciences, Acting Professor, S. Seifullin Kazakh Agrotechnical Research University

Salmonellosis abortus in mares is an infectious disease caused by *Salmonella abortus equi*, accompanied by abortion and birth of non-viable fetuses. Economic damage occurs due to loss of reproductive ability of sires, under receipt of litters, reduced productivity of mares and costs of veterinary measures. In many countries there is a high level of infection in horses, including Kazakhstan [1,2]. The main method of diagnosis is bacteriological, but unfortunately, it is insufficiently sensitive, time-consuming and depends on the condition of the material under study. For the diagnosis of salmonellosis abortion, the OIE recommends the use of modern effective methods: PCR and ELISA, however, the use of PCR in veterinary laboratories is difficult due to the high cost of equipment and the high price of test systems, and when using the ELISA method, the composition and purity of the antigen is of great importance [3,4].

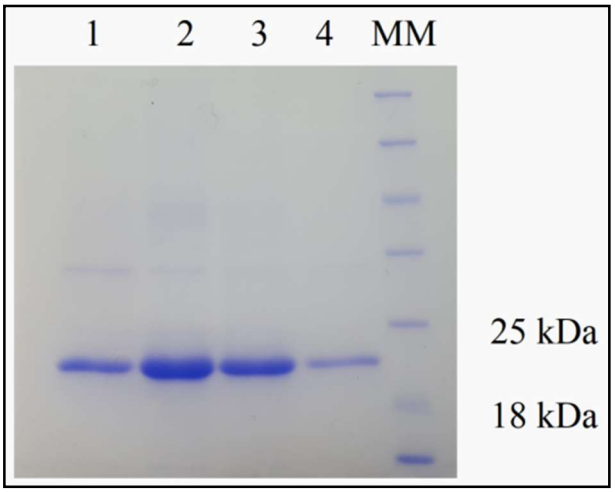
Genetic engineering methods make it possible to obtain recombinant antigens of animal pathogens containing individual proteins of diagnostic value and excluding the content of amino acid sequences that can cause nonspecific reactions. These antigens can be used in tests for detection of antibodies in blood serum samples, immunization of laboratory animals, as well as in the development of vaccines.

According to [5,6], outer membrane proteins are diagnostically significant antigens of Salmonella. The outer membrane protein OmpX of *S. abortus equi* is highly immunogenic and conserved, so was selected as a target.

The aim of the work was to study the properties of the obtained recombinant OmpX antigens of *S. abortus equi*.

Keywords: *Salmonella abortus equi*, recombinant protein, refolding, specificity.

Materials and methods of research. The object under study was the previously obtained recombinant OmpX antigen of *S. abortus equi* [7]. Electrophoretic separation of the recombinant protein was performed according to the method of Lammli [8] in 12% polyacrylamide gel under denaturing conditions. Western blot. Protein electrophoresis was carried out in 11% PAGE in the presence of sodium dodecyl sulfate according to the method of J. Laemmli on an electrophoresis apparatus (BioRad, USA). Electrophoretic transfer of recombinant protein onto nitrocellulose membrane was performed using an immunoblotting device (BioRad, USA) according to H. Towbin [9]. Results. As a result of working out the parameters of isolation and purification of recombinant OmpX protein of Salmonella abortus equi, purified preparations of the antigen were obtained. Electrophoretic analysis showed the purity of the preparation with a molecular mass of 23 kDa (Figure 1).

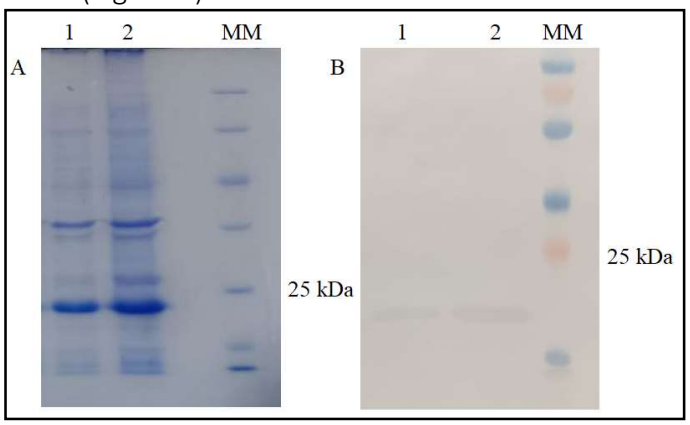


Note: Line1-4 are fractions of recombinant protein after purification; MM - molecular markers.

Figure 1 - Results of electrophoretic analysis of rOmpX of *S. abortus equi*

To verify the amino acid sequence, the recombinant protein was analyzed by LC/MC-MC spectrometry. As a result, peptides containing QTTDYPTYKHDTSDYGFSYGAGLQFN amino acid sequences were identified. A search of the peptide spectrum in the SwissProt database showed that the obtained amino acid sequences corresponded to the OmpX protein of *Salmonella abortus equi*.

High molarity urea was used in the purification of rOmpX, so it is necessary to evaluate protein refolding. To determine the quality of protein refolding and the conservation of antigenic epitopes of the protein, we used Western blot with control positive sera, which specifically reacted with protein of mol. mass 23kDa (Figure 2).



Note: Line 1-2, rOmpX; MM, molecular markers

Figure 2 - PAGE (A) and Western blot (B) of rOmpX *S abortus equi* with serum.

The obtained recombinant OmpX protein was then used as an antigen in an indirect ELISA to determine the antibody titer in serum samples from aborted mares. The results of n-ELISA showed the presence of antibodies against *Salmonella enterica* OmpX protein in serum at a titer of 1:1600 (+26.6; - 21.1).

Conclusion. The main properties of the obtained recombinant OmpX protein of *S. abortus equi* with a molecular mass of 23 kDa were studied. Comparative analysis of the amino acid sequence of recombinant proteins showed a complete match with the reference sequences presented in the PubMed NCBI database. The correctness of protein refolding was confirmed by Western blot and ELISA with positive control sera. The specificity of recombinant OmpX proteins, which interacted only with positive serum samples from horses from an unfavorable farm, was determined.

The obtained recombinant antigens can be used in the creation of tests for the diagnosis of salmonellosis abortus in horses in the Republic of Kazakhstan.

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УДК 577.3

БИОФИЗИКА В МЕДИЦИНСКИХ ВУЗАХ КАК ОРИЕНТИРОВАННЫЙ КУРС

Аймаханов Мақсат Сәкенұлы
Научный руководитель магистр, старший преподаватель, Международный казахско-турецкий университет имени Ходжи Ахмеда Ясави Медицинский факультет Кафедра «Общая хирургия», г.Туркестан, Казахстан
Абдуллаева Альбина Аманжолқызы
Студент 3-го курса специальности «Общая медицина», Международный казахско-турецкий университет имени Ходжи Ахмеда Ясави Медицинский факультет, г.Туркестан, Казахстан

Аннотация. В данной работе рассматривается дисциплина «Биофизика», которая изучается и преподается во многих медицинских вузах. Выделяются профессиональные и ориентированные вопросы данной дисциплины, а также, способствуют формированию высокого уровня мотиваций студентов к изучению данной дисциплины и эффективному формированию профессиональных и общекультурных компетенций. Описываются физические задачи профессионально ориентированного характера, которые могут быть использованы в процессе изучения дисциплины в медицинских вузах.
Ключевые слова: биофизика, оптимизация преподавания, компетенция, физика, медицина, инновация.

Все, что происходит в материальном мире, взаимосвязано и взаимообусловлено, и развитие биологии показало, что для понимания элементарных биологических явлений необходимо применение понятий и методов точных наук, как математика, физика, химия и др. Поэтому на стыке биологии и физики возникла новая наука – биофизика.

Биофизика изучает физические, химические и физико-химические процессы в биологических системах на всех этапах их развития с помощью законов и методов биофизики. На основе ряда физиологических процессов, протекающих в организме человека, лежат общие физические закономерности. Многие визуальные и диагностические методы и методики, а также методы лечения основаны на применении физических принципов, использовании физических явлений и процессов [1]. Множество медицинских техник по своей конструкции представляют физические приборы. Медицина использует результаты теоретических и экспериментальных достижений в области физики и биологии. Таким образом, биофизика играет исключительно важную роль для медицины, а также для становления и формирования будущего врача. В 1961 году биофизика, по решению I-го Международного Биофизического Конгресса, сформировалась, как индивидуальная наука. Основываясь данному решению этого конгресса биофизику, можно разделить на следующие разделы:

1. Молекулярная биофизика – рассматривает строение и физические свойства биологических макромолекул (белок, липид, аминокислоты и др.), микромолекул и структуры биологических систем на уровне молекул. Этот раздел возник благодаря историческим открытиям как, открытие двойной спирали ДНК Д.Уотсоном и Ф.Криком; открытие структуры белка Л.Полингом и другим открытиям в области естественных наук.

2. Биофизика клетки – исследует элементарную ячейку жизни; клетку и клеточные органеллы и их роль в физико-химических процессах. В развитии клетки сыграли огромную роль открытия А.Хаксли, Шванна, Шлейдена и др.

3. Биофизика сложных систем – занимается изучением и моделированием внутренних связей в биологических объектах на всех уровнях, от молекулярного до экологического, а также, включает в себе некоторые разделы биокибернетики.

4. Биофизика органов чувств – изучает механизмы перехода и передачи энергии внешних раздражителей в электрические импульсы в рецепторах с целью передачи информации.

Помимо этих четырех разделов биофизика исследует влияние на живой организм различных физических факторов как шум, электромагнитных полей, ионизирующих излучений и др. Некоторые проблемы послужило основой для создания новых областей науки. Так, биологическое действие ионизирующих излучений стало предметов исследования радиобиологии.

Биофизика как отдельная наука развивается, используя современной достижении физиологии, биологии, химии, физики, математики, компьютерной технологии, нанотехнологии. На рис.1 показано взаимосвязь между отдельными отраслями науки.

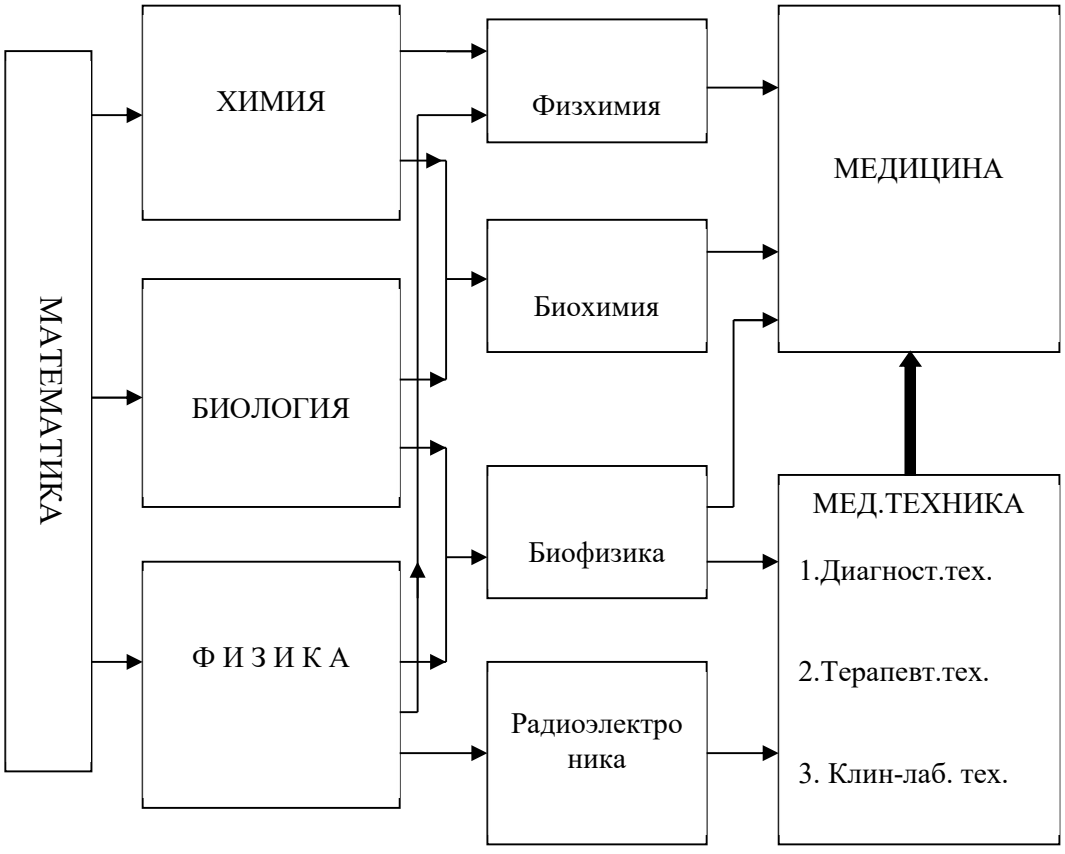

Рисунок 1.

Биофизика мембран изучает структуру биологических мембран, транспорт через них, генерацию и распространение нервного импульса, процессы рецепции и преобразование энергии. Большинство которых осуществляетсяна биомембране.

Биомебран выполняет в организме множество функции, к ним относятся:

-механическая, благодаря которому создается раздел между клеткой и окружающей ее средой, обеспечивается относительно автономное, целестноефункцирование клетки;

- барьерная, благодаря которому обеспечивается селективное, регулируемое пассивное и активное обмен(транспорт) веществ между клеткой и окужающей средой;

- матричная, благодаря которой в БМ удерживается белки и ферменты;

-энергетическая,благодаря которой на БМ происходит синтез АТФ, генерация биопотенциалов;

- рецепторная, благодаря которого происходит распознание других клеток и веществ.

Поэтому данный раздел особенно важен для врачей, так как эффективность многих лекарственных средств зависит от скорости их проникновения в ту или иную ткань, что определяется проницаемости биологических мембран. Кроме того действие многих направленно на изменение проницаемости мембран для некоторых веществ

Так как многие патологические процессы, действие физических и химических факторов в первую очередь отражается на мембранах, то изучение их свойств нашло широкое применение в медицине .

В настоящее время общепризнанным моделям БМ является модель предложенный в 1971 году Никольсоном и Сингером так называемая «жидкостно-мозаичная» модель, согласно которой основу ее строение составляет двойной слой липидов. Все клеточные мембраны построены в основном из липидов, белков и углеводов, причем последние образуют соединения с белками, называемый–гликопротеидами, а соединения с липидами называется- гликолипидами. Структурной основой биологической мембраны (БМ)служит липидный бимолекулярный слой. Его образования обусловлено особенностями взаимодействия с водой мембранных липидов. На их долю приходится от 15% до 50% сухой массы разных клеточных мембран.

Естественно-научные дисциплины обеспечивают необходимую обще образовательную и обще культурную подготовку студентов и способствуют развитию их профессионально значимых качеств будущих специалистов, формируют обще культурные и профессиональные компетенции студентов. Высокий уровень естественно-научных знаний остается у человека на весь период его активной деятельности и обуславливает его успешность в обучении. Как правило, студенты имеющие высокий уровень знаний по дисциплинам естественно-научного цикла успешны на протяжении всего обучения. Естественно-научные дисциплины в медицинских вузах играют большую роль в успешной подготовке врача, следовательно, в целом для будущего развития медицины. Это связано с совершенствованием и усложнением медицинского оборудования, диагностических аппаратов, методов диагностики и лечения, необходимостью правильной оценки результатов исследования. [2].

Обзор и анализ последних исследований А.В.Тарасовой, В.Н.Федоровой и др. посвященных проблеме преподавания естественнонаучных дисциплин в медицинском вузе позволили выделить их специфические особенности: - физика в медицинском вузе – это дисциплина, представляющая собой комплекс разделов прикладной физики и биофизики, в которых рассматриваются физические законы, явления, процессы и характеристики применительно к решению медицинских задач [3]; - практикумы в медицинском вузе отведена особая роль, которая связана со спецификой качеств, которыми должен обладать будущий специалист. Поэтому внедрение практикумов на младшей ступени обучения в вузе необходимо для постепенной выработки у будущего врача самостоятельности, аккуратности, логичного поведения в незнакомой ситуации, инициативности, смелого, но разумного принятия решений [4]; - практикумы по биофизике в медицинском вузе как практикум точной науки призван формировать у студентов логическое мышление, умение точно формулировать задачу, способность выделять главное и второстепенное, что также необходимо для профессионального обучения врача [4]; - обучения в физическом практикуме ориентируется на последующее применение полученных знаний студентами в

курсах терапии, рентгенологии, хирургии, радиологии, гигиены и других, так же физика является пропедевтическим курсом основ физиологии [5];

Оптимизации учебного процесса во многом базируется на интенсификации познавательной активности. Понятие познавательной активности многоаспектно и многогранно. Традиционным методом получения теоретических знаний остаются практические занятия, на которых заслушиваются презентации по теме в виде мультимедийных докладов, проводится опрос и тестирование с оценкой полученных результатов. Наряду с этим, в жизни лекцию часто называют «горячей точкой». Ее цель – формирование ориентировочной основы для последующего усвоения студентами учебного материала. Термин «лекция» пришел к нам из средних веков. В то время лекция была единственным способом получения знаний студентами. Чтение лекций – это не пересказ материалов учебной литературы, а умение преподавателя и студента совместно думать, искать, рассуждать. В настоящее время трудности лектора связаны с тем, что при подготовке к лекции ему необходимо использовать многие источники информации: учебники, монографии, телевидение, интернет-ресурсы [6]. Данная дисциплина, включена в базовую часть естественно-научного и медико-биологического цикла.

В результате изучения физической составляющей данной дисциплины студенты должны:

1) Знать основные физические явления и закономерности, лежащие в основе процессов, протекающих в организме человека; характеристики воздействия физических факторов на организм; физические основы функционирования медицинской аппаратуры; правила техники безопасности, работы с физическими приборами; правила использования ионизирующего облучения и риски, связанные с их воздействием на биологические ткани; методы защиты и снижения дозы воздействия; основные законы биомеханики и ее значение для медицины;

2) Уметь пользоваться физическим оборудованием; работать с увеличительной техникой (микроскопами, оптическими и простыми лупами); владеть простейшими медицинскими инструментами (фонендоскоп, неврологический молоточек и т.д); медицинскими и стоматологическими инструментами;

3) Обладать следующими компетенциями:

1.Общекультурными: способен и готов использовать на практике методы естественно-научных наук в различных видах профессиональной и социальной деятельности;

2.Профессиональными: способен и готов выявлять естественно-научную сущность проблем, возникающих в ходе профессиональной деятельности врача, использовать для их решения соответствующий физикохимический и математический аппарат;

4) Способен и готов к участию в освоении –современных теоретических и экспериментальных методов исследования с целью создания новых перспективных средств, в организации работ по практическому использованию и внедрению результатов исследований;

5) Способен и готов к интерпретации лабораторных, аппаратных результатов проведенных исследований [5].

Профессионально ориентированными вопросами понимают вопросы, изучение и решение которых может быть необходимым для будущей профессиональной деятельности врача. В классификацию профессиональноориентированных вопросов включены вопросы, посвященные: • основным методам определения физических величин в медицине; • специфике физических явлений и процессов в медицинской практике; • применению в медицине физических явлений, процессов, приборов (применение в диагностике для

исследования, применение в лечебной практике); • описанию принципа действия медицинских приборов, являющихся по своей сути физическими приборами.

Профессионально ориентированные вопросы курса биофизики в медицинском вузе можно изучать и при решении физических задач профессионально ориентированного характера. Под физическими задачами профессионально ориентированного характера мы понимаем физические задачи, содержание которых имеет ярко выраженный профессионально ориентированный характер, решение может оказаться полезным в будущей профессиональной деятельности врача [6]. Применение при обучении будущих врачей физических задач профессионально ориентированного характера, как показали результаты исследования, положительно влияет на результаты обучения студентов, способствует развитию творческой личности будущего специалиста, формированию у него ценностного отношения к профессии врача. Физические задачи профессионально ориентированного характера могут быть использованы во время учебных занятий при изучении нового материала, повторении, закреплении и обобщении изученного, при организации аудиторной и внеаудиторной самостоятельной работы студентов. Применение физических задач профессионально ориентированного характера дает возможность индивидуализировать процесс обучения. Данная дисциплина, включающие эксперимент с использованием медицинской аппаратуры, направленные на решение различных математических, физических, биофизических ситуационных задач, способствуют формированию высокого уровня внутренней мотивации студентов и формированию их профессиональных и общекультурных компетенций. Ежегодный мониторинг выживаемости знаний студентов, анкетирование обучающихся свидетельствует о повышении качества знаний студентов, появление студентов с устойчивой мотивацией к изучению биофизики, физики, биологии и математики, что напрямую связано с инновациями в преподавании естественнонаучных дисциплин, с использованием новых идей, современных средств и технологий в обучении.

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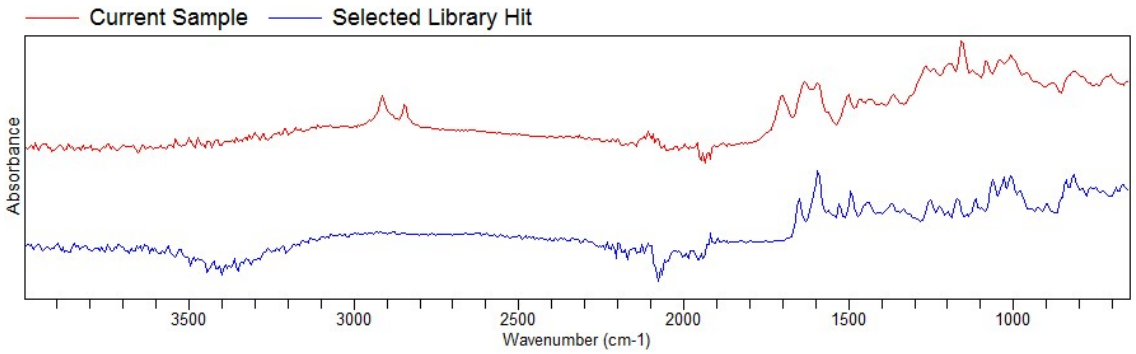
DETERMINATION OF QUERSETIN OBTAINED FROM ONION PEELS BY IR SPECTROSCOPY

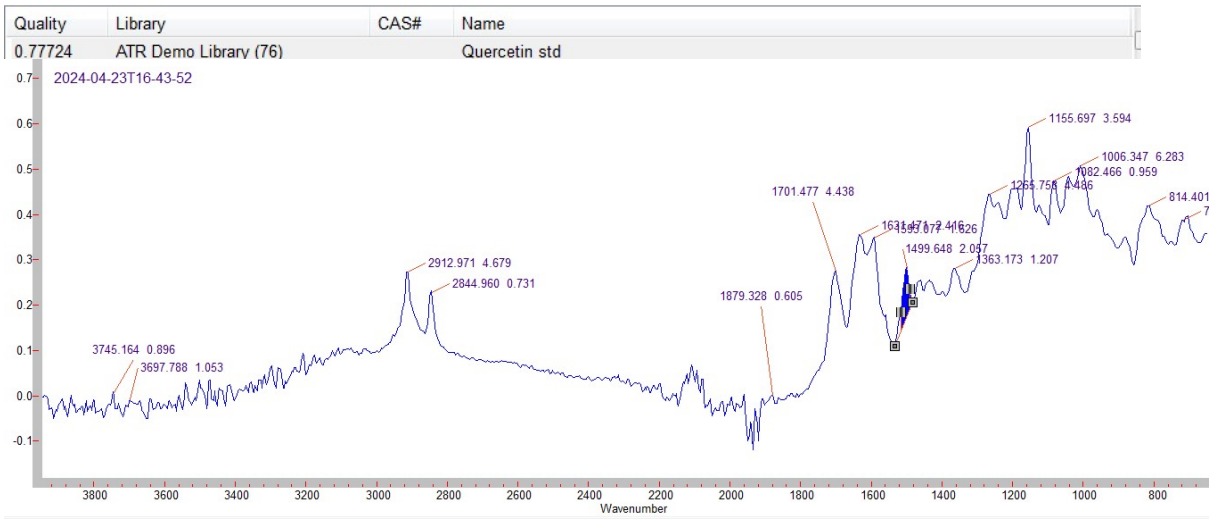
Ismayilova Sh.Y.
Iskenderov V.H.
Hajibayli T.A.
Aliyev H.Y.
Abdullayeva A.A.

Key worlds: quersetin,onion peels, column chromatography, IR spectroscopy.

İntroduction: Quercetin is abundant in various vegetables and fruits such as apples, honey, raspberries, onions, red grapes, cherries, citrus fruits, and green and red leafy vegetables. This includes the high quercetin content in the yellow onion peel. Onions are one of the most important horticultural crops. In 2019, current production worldwide reached approximately 100 million tons, resulting in the generation of constant amounts of solid waste material. Current literature reports that the annual production of onion waste in Europe is about 500,000 tons, especially in large producing countries such as Spain, the Netherlands and the United Kingdom . Onion peels, the most common waste material from onion processing, represent a reservoir of molecules with valuable biofunctional properties. Within the (phyto)-complex, quercetin and its glycosylated forms play an important role in this context.

Material and methods: 50 grams of onion peels were weighed, boiled in 200 ml of water, cooled, then fractionated and the water was distilled from the rotor.
Thin layer chromatography was carried out in the system chloroform:methanol:water (70:30:1). We then performed column chromatography. Silica gel was chosen as the stationary phase. Chloroform:methanol (1:1) was used as the mobile phase. Then we collected the filtrate into a vial, dried it, and took the pure substance. We analyzed it by UV spectrophotometry. For comparison, we took a sample of standard quersetin. Based on the spectrum, it was confirmed that the substance we took was quersetin. We then analyzed again whether our substance was quercetin or not using IQ spectrophotometry. We concluded that it was definitely quercetin.
Results: These are İR spectrum of sample substance (2) and İR spectrum of quercetine standart (1) on Agilent FTİR 630 İR-Library.





Conclusion: The IR-spectrum of the substance isolated from onion peels was obtained and scanned in the IR library, proving this substance was quersetin.

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Каллусты культуралардың физиологиялық және биохимиялық ерекшеліктері

Умарова Асем Ораловна
Л.Н.Гумилев атындағы Еуразия ұлттық университетінің жаратылыстану факультетінің, биотехнология мамандығы бойынша 2-курс магистранты, Астана, Қазақстан
Сегизбаева Гульсим Жалгасовна
Л.Н.Гумилев атындағы Еуразия ұлттық университетінің жаратылыстану факультетінің, биотехнология мамандығы бойынша 2-курс магистранты, Астана, Қазақстан
Ғылыми жетекші – **Сегизбаева Гульсим Жалгасовна**

Аңдатпа

Каллус ұлпасы аморфты және белгілі бір анатомиялық құрылымы жоқ, бірақ шығу тегі мен өсу жағдайына байланысты оның консистенциясы әртүрлі болуы мүмкін: борпылдақ, жоғары гидратталған жасушалардан тұратын, бөлек шағын агрегаттарға оңай ыдырайтын; орташа тығыздық, бірақ дәл анықталған меристемалық ошақтармен; тығыз, мұнда камбиальды элементтер дифференцияланады. Белоктардың құрамына кірмейтін бос аминқышқылдары организмдердің тіршілігіне қажет және көптеген зат алмасу процестерінде маңызды рөл атқарады, соның ішінде аминқышқылдарымен, органикалық қышқылдармен, физиологиялық белсенді заттармен белоктардың синтезі.

Кіріспе. Қазіргі уақытта өсімдіктерде кездесетін заттардың орасан зор мөлшерін адамдар пайдаланады және бұл заттардың қоры шексіз емес екені белгілі. Осыған байланысты екіншілік өсімдік метаболиттерінің синтезі қажеттілігі туындады. Бұл процесс сирек кездесетін және жойылып бара жатқан өсімдіктер түрлерін сақтауға ықпал етеді. Бірақ бұл өсімдіктер тропиктік және субтропиктік аймақтарда өседі [1].

Өсімдік клеткалары сияқты *in vitro* жағдайында алынған жасуша және ұлпа дақылдары үлкен практикалық маңызы бар екіншілік метаболиттерді синтездей алады. Биологиялық белсенділіктің кең ауқымы және табиғи өсімдік материалдарынан жасалған фармакологиялық препараттардың әсер етуінің «жұмсақтығы» негізгі артықшылықтар болып табылады [2]. Өсімдік жасушаларының культурасы көбінесе іргелі және қолданбалы зерттеулердің кең ауқымында кеңінен қолданылады [3]. Жоғары сатыдағы өсімдіктердің культура клеткаларының мен ұлпаларының негізінде қазіргі уақытта өнеркәсіп пен ауыл шаруашылығының әртүрлі салаларына арналған перспективалы, принципті жаңа технологиялар құрылуда және белсенді түрде дамып келеді [4].

Бүгінгі таңда медициналық тәжірибеде қолдану үшін өсімдіктерден көптеген дәрілік заттар алынады. Олардың көпшілігінің құрылымы өте күрделі, сондықтан өсімдіктер ұзақ уақыт бойы дәрілік заттардың жалғыз көзі болады [5].

Физико – химиялық қасиеттері

Жасушаның in vitro жағдайында дифференциацияланған күйге ауысуы және жасушаның белсенді бөлінуі жасушалық гендердің белсенділігінің өзгеруіне байланысты болады: кейбір гендердің активтенуі және басқаларының репрессиясы жасушалардың

ақуыздық құрамының өзгеруіне әкеледі. Дефференцирленген жасушаның бақыланбайтын көбеюге өтуі кезінде жасушаларда биохимиялық және цитологиялық өзгерістер орын алып, каллус ұлпасының түзілуіне әкеледі [6].

Дедифференциация қосалқы заттарды қолданудан және арнайы жасуша органеллаларын жоюдан басталады. Дедифференциация индукциясынан кейін 6-12 сағаттан кейін жасуша қабықшасы босап, ісінеді, бос рибосомалардың саны көбейеді, Гольджи аппаратының элементтерінің саны көбейеді, ядрошықтардың мөлшері мен саны ұлғаяды. Бұл өзгерістердің барлығы 48-72 сағаттан кейін басталатын бөлінулердің басталуына дейін болады.Сонымен қатар, өсірудің басында эксплантты жасушаларында де дифференциациядан да, жарақаттық синтезден де болатын зат алмасудың өзгерістері байқалуы мүмкін. Бұл процестерді бөлу үшін эксплантты 3-6 күн бойы гормондары жоқ ортада алдын ала инкубациялаған дұрыс [7].

Аминқышқылдары өсімдіктердің өсіп келе жатқан мүшелері мен бөліктерінің ақуыз синтезін қамтамасыз ететін негізгі бастапқы заттар болып табылады. Өсімдік физиологиясы бүгінде организм тіршілігінің химиялық, физика-химиялық және физикалық аспектілерін зерттеуге сүйенеді; осы аспектілерге арналған тәуелсіз ғылымдар - биохимия, биофизика, биофизикалық химия пайда болды. Олар физиологияның негізі болып табылады, өйткені соңғысы химиялық және физикалық процестер арасындағы байланыс заңдылықтары ашылғанда ғана тіршілік әрекетінің құбылыстарын тануда табысқа жете алады [8].

Қызғылт катарантус (*Catharanthus roseus* L.) - кендір тұқымдасының мәңгі жасыл көпжылдық бұтасы [9]. *Catharanthus rosea* (немесе *Vinca rosea*) өсімдігінің әртүрлі бөліктерінен 100-ден астам индолдан алынған алкалоидтар бөлінеді. Онкологиялық аурулардың әртүрлі формаларын кешенді терапияда және қант диабетін емдеуде кеңінен қолданылатын винбластин, винкристин, катарантин, ажмалицин және виндолин алкалоидтары қазіргі таңда ерекше қызығушылық тудыруда [10]. Бұл өсімдіктің құрамындағы кейбір алкалоидтар (резерпин, серпентин) транквилизаторлар болып табылады. Әртүрлі катарант ұлпаларында алкалоидтардан басқа стероидтар, фенолдық қосылыстар, антоцианиндер, май қышқылдары және антиоксиданттық және қабынуға қарсы әсері бар басқа метаболиттер бар екені анықталды [11].

Vinca minor L. - *Apocynaceae* тұқымдасына жататын көпжылдық мәңгі жасыл сусымалы бұта. Бұл өсімдіктің қайталама метаболиттеріне: урзол қышқылы, флавоноидтар, ащы және таниндер, сапониндер, қанттар, С витамині, каротин, рутин, сонымен қатар индол алкалоидтары жатады [12]. Винкамин препараттары ми қан айналымын белсендіруші болып табылады.

Зерттеу материалдары мен әдістері. Зерттеу объектілері ретінде гетеротрофты каллус дақылдары *Vinca minor* L. және *Catharanthus roseus* L. көзделді. Мурасиге Скуг қоректік ортасына фитогормондардың белгілі мөлшерін қосу арқылы каллусты культураларға қолайлы орта дайындалды. Каллусты культураларды өсіру 30 күн бойы 25 ºС температурада термостатта қараңғы жерде жүргізілді.

Кесте 1. Мурасиге Скуг қоретік ортасының құрамы

№	Орта құрамы	Мөлшері
	Макротұздар ерітіндісі (1 л ерітіндіге арналған г мөлшері)	
1.	KNO_3	38
2.	NH_4NO_3	33
3.	KH_2PO_4	3,4
4.	$MgSO_4 . 7H_2O$ немесе сусыз $MgSO_4$	7,4
5.	$CaCl_2 . 2H_2O$ немесе сусыз $CaCl_2$	3,6
	Микротұздар ерітіндісі (100 мл ерітіндіге арналған мг мөлшері)	
6.	$Na_2MoO_4 . 2H_2O$	25
7.	$CuSO_4.5H_2O$	2,5
8.	H_3BO_3	620
9.	$MnSO_4 . 5H_2O$ немесе $MnSO_4 . 4H_2O$	2410 2230
10.	$ZnSO_4 . 7H_2O$	860
11.	KJ	83
12.	$CoCl_2 . 6H_2O$	2,5
13.	$FeSO_4$	557
14.	Na_2 ЭДТА	745

Vinca minor L. каллус культураларының өсу белсенділігін сипаттау үшін жұмыста келесі көрсеткіштер анықталды: меншікті өсу жылдамдығы, биомассаның екі еселену уақыты және өсу индексі. Берілген формулалар көмегімен нәтижелер алынды.

Алынған нәтижелерді өңдеу үшін вариациялық статистиканың стандартты әдістері қолданылды. Негізгі статистикалық сипаттамалар мыналар болды: орташа арифметикалық орта (x), стандартты ауытқу (σ), орташа мәннің қателігі (Sx) және орташа мәндер арасындағы айырмашылықтардың сенімділігі (t).

Орташа арифметикалық (x), стандартты ауытқуды (σ) және орташа мәннің қателігін (Sx) анықтау үшін Excel бағдарламасының статистикалық деректерді талдау пакеті пайдаланылды.

Зерттеу нәтижелері. Жасушалық және ұлпалық культуралардағы алғашқы метаболикалық процестердің белсенділігін бағалауға мүмкіндік беретін ең маңызды сипаттама - берілген дақылдың өсу параметрлері болып табылады. Біз нақты өсу қарқынын, биомассаның екі еселену уақытын және өсу индексін бағаладық.

Зерттеудің бірінші кезеңінде гормонның *Catharanthus rosea* және *Vinca minor* каллус культураларының өсу сипаттамаларына әсері зерттелді. Зерттеулер нәтижесінде *Catharanthus roseus* каллус культурасының бақылау нұсқасымен салыстырғанда 50 мг/л, 100 мг/л және 200 мг/л концентрация мөлшеріндегі гормон өсіру ортасына қосу кезінде өсу параметрлеріне статистикалық маңызды әсер етпейтіні анықталды.

Өсу индексін талдау кезінде 25 мг/л концентрацияда *Catharanthus roseus* каллус культурасының қоректік ортасына гормонның қосылуы бақылаумен салыстырғанда осы өсу параметрінің 21%-ға төмендеуіне (ингибирлеуіне) әкелетіні анықталды. Бақылау нұсқасында өсу көрсеткіші 10,45 салыстырмалы бірлікті құрады, ал гормонды қоректік ортаға 25 мг/л концентрацияда қосқанда – 8,63 салыстырмалы бірлік мөлшерін көрсетті.

Биомассаның екі еселену уақытын зерттеу кезінде *Catharanthus roseus* каллус культурасының қоректік ортасына гормонның қосылуы биомассаның екі еселену уақытының бақылаумен салыстырғанда 21%-ға ұлғаюына әкелетіні анықталды. Қоректік ортаға 25 мг/л

концентрацияда гормон қосылды. Бақылау нұсқасында биомассаның екі еселену уақыты 2,08 күн, ал 25 мг/л гормон қосылғанда бұл көрсеткіш 2,52 күнді құрады.

Қорытынды. *Catharanthus roseus* каллус ұлпасының қоректік ортаға 25 мг/л концентрацияда гормон қосылуы өсу параметрлерінің (биомассаның екі еселену уақытын қоспағанда) 17-21% тежелуіне әкелді. Бұл амин қышқылының биомассаның екі еселену уақытына әсері бақылау нұсқасымен салыстырғанда осы өсу параметрінің 21%-ға артуына әкелді. Сондай-ақ, гормонның қоректік ортаға 50 мг/л, 100 мг/л және 200 мг/л концентрацияларында қосылуы зерттелетін каллус ұлпаларының өсу көрсеткіштеріне статистикалық маңызды әсер етпегені байқалды.

Гормонның *Vinca minor* L. каллус ұлпасының қоректік ортаға қосылуы бақылау нұсқасымен салыстырғанда өсу параметрлерінің 16-51,7%-ға төмендеуіне әкелді. Сонымен қатар, 200 мг/л концентрацияда гормоны бар қоректік ортада өсірілген *Vinca minor* L. каллус ұлпасында өсудің максималды тежелуі байқалды. Бұл амин қышқылы өсіру ортасына 25 мг/л, 50 мг/л және 100 мг/л концентрацияда енгізілгенде, *Vinca minor* L. каллус культурасының өсу көрсеткіштеріне статистикалық маңызды әсері болмағаны анықталды.

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Economic Sciences

Ethical considerations in AI-driven project management

Iliyas Aigul Orazbekkyzy
Master' s student at Kazakh-British Technical University

ABSTRACT

The research paper examines the ethical aspects of applying artificial intelligence (AI) to project management. Modern project management uses AI tools to handle intricate problems like cost overruns, delays in project completion and risk management. To balance the advantages of AI with any potential ethical risks or difficulties, however, is imperative.

The principal aims of this study are to identify and analyse the ethical issues associated with the application of AI in project management, propose strategies to address these issues while optimising the benefits and consider existing ethical control frameworks. A thorough literature analysis and synthesis of ethical frameworks and principles were carried out in order to accomplish these goals.

Several strategies are proposed to achieve a balance between the benefits and the risks. These include the creation of strong ethical frameworks, the application of improved governance and regulatory frameworks, and the active participation of project stakeholders in ethical decision-making processes. The paper emphasises how critical it is to integrate principles like accountability, fairness and transparency at every stage of AI project management systems development.

The paper's conclusions draw attention to the ethical problems that AI project management techniques present particularly with regard to privacy, bias, fairness, transparency and accountability. Although artificial intelligence has many benefits including increased accuracy, efficiency and capacity across various project management domains, it is critical to recognise the ethical compromises these advantages entail. In addressing moral dilemmas and making sure AI development is in line with societal norms and human rights it promotes a proactive approach. The paper calls for more investigation and teamwork to advance moral AI practices.

1 INTRODUCTION

By enhancing decision-making, streamlining procedures and raising the likelihood of successful project outcomes, Artificial Intelligence plays a critical role in project management. It complements project managers and helps them become more proficient in managing projects in an effective and efficient manner. According to the PMI report from 2023 [1], artificial intelligence is expected to have a big impact on project management in the following four areas:

1. Resource allocation and task distribution;
2. Risk management;
3. Project scheduling;
4. Communication and collaboration [1];

These are some instances of the current ways AI is changing project management. Firms that have invested in AI have seen an average 15% increase in productivity [2].

Artificial Intelligence's efficacy is largely dependent on the data it uses. Data-centric AI techniques in project management are rapidly gaining traction due to the growing volume of data generated on a daily basis and the progress made in data processing and storage technologies.
Thus, to support the meaningful application of AI, organisations need to invest in acquiring or training IT and data specialists, create a strategy for data governance and maintain transparency. Protecting the confidentiality, integrity and availability of data must be an essential part of any response to these future-focused business initiatives [1].
This paper addresses a fundamental dilemma in AI Project Management: how to maximise the vast potential of AI for advancement and innovation while effectively mitigating its ethical risks. The hypothesis posits that while AI implementation offers unparalleled opportunities in various sectors, it simultaneously poses significant ethical challenges. These challenges encompass critical concerns such as privacy, data integrity, systemic bias, and transparency in AI-driven decisions. The paper suggests that a balanced approach, integrating both technological and ethical strategies, is crucial to harness the benefits of AI project management while upholding ethical standards.
The ethical challenges within the integration of AI into project management are intricate and diverse. They encompass preserving confidentiality and securing sensitive project data, mitigating biases inherent in datasets and algorithms, and upholding transparency in AI-driven decision-making processes. These concerns underscore the importance of robust measures to authenticate data, ensure fairness, and clarify decision-making protocols. To navigate these ethical complexities, there's a call for a collaborative strategy merging technological innovations, regulatory frameworks, and ethical principles. This collective approach seeks to cultivate AI systems in project management that are not just proficient and productive, but also ethically sound and socially advantageous.
The importance of ethical deliberations in utilising AI in project management cannot be overstated. As AI systems increasingly permeate daily operations, impacting facets ranging from stakeholder behaviours to crucial project decisions, the ethical management of underlying data becomes progressively vital. Matters like upholding data privacy, acquiring informed consent, and guarding against privacy breaches are paramount for upholding AI solidity. Additionally, the potential for biases inherent in data, which can yield unjust or discriminatory outcomes, presents a substantial hurdle. These biases may mirror existing societal disparities and, if unattended, could perpetuate or exacerbate them through AI applications.
Moreover, the ethical implementation of AI technologies surpasses mere compliance with regulations; it entails a broader societal obligation to ensure that these tools are employed in manners that benefit society while honouring individual rights and advancing equity and fairness. This encompasses contemplating the enduring societal ramifications of AI, including its influence on employment, privacy, and social structures. Establishing ethical frameworks and guidelines for AI in project management is not only a technical requisite but also a moral obligation, guaranteeing that advancements in this domain align with shared values and contribute to societal advancement.

2 LITERATURE REVIEW

2.1 COMPREHENSIVE REVIEW OF EXISTING STUDIES ON AI ETHICS IN PROJECT MANAGEMENT

Synopsis of AI Ethics: As AI is used more and more in various spheres of society research on AI ethics has advanced rapidly. Jobin et al. [3] have carried out a comprehensive examination of the ethical guidelines recommended for AI highlighting the parallels and discrepancies in international perspectives. Furthermore, Mittelstadt et al. [4] present a critical viewpoint on AI ethics as they examine the moral dilemmas raised by big data algorithms and AI. These foundational studies set

the stage for understanding the larger ethical framework that governs the operation of data-focused AI.

Focus on Data Ethics: Data ethics has gained a lot of attention lately especially when it comes to artificial intelligence. By emphasising the obligations of data governance and the consequences of data misuse Floridi and Taddeo [5] draw attention to the ethical significance of data in AI. O'Neil's [6] research which examines algorithmic biases' impact on data-driven decision-making critically is in line with their findings. O'Neil shows how these biases can cause moral conundrums and damage to society. The importance of ethical issues in the collection analysis and application of data in AI systems is highlighted by these studies.

Recent Advances in AI Ethics: New studies have improved our understanding of AI data ethics. Hagendorff [7] explores topics of AI ethics like accountability, transparency and fairness. Furthermore, Boddington [8] presents viewpoints on the moral development and application of AI systems advocating for a proactive approach to ethical concerns from the beginning of AI initiatives. These studies contribute to the growing consensus regarding the need for ethical frameworks and guidelines tailored to the particular difficulties presented by data-focused AI.

2.2 MAIN ETHICAL CONCERNS IN AI ETHICS: DATA PRIVACY, ACCOUNTABILITY, AND BIAS

Data Privacy in AI: A vital component of implementing AI ethically in project management is ensuring data privacy. Cavoukian and Jonas [9] studied a concept similar to Privacy by Design, the importance of incorporating privacy considerations into the design phase of AI systems. Taylor et al. [10] support this idea by outlining the challenges and possible solutions related to data privacy in AI. They emphasise how crucial it is to incorporate data protection policies and procedures to eliminate the possibility of sensitive data being misused or accessed without authorization.

Consent in the AI Age: The concept of consent has evolved in the AI era. Nissenbaum [11] proposes the idea of "contextual integrity" as a solution to consent-related problems in the realm of AI and Big Data. Her framework suggests a more thorough approach to dynamic consent models.

Bias in AI Systems: Bias in AI systems is a significant ethical concern. In their research, Barocas and Selbst [12] explore how biases in data can result in discriminatory results when AI makes decisions. Benjamin [13] explores the relationship between biased technology and the human race. According to these studies, it is critical to thoroughly audit AI systems to identify and correct biases and ultimately produce fair results.

3 APPLICATION OF AI IN PROJECT MANAGEMENT AND ITS BENEFITS

Artificial Intelligence has existed as a technological field since the 1950s. Nowadays, many industries are progressively exploring its potential applications but only a few have managed to fully realize it and many more have fallen short. The Project Management sector has been changing and adapting to AI even before the 2020 pandemic. Professionals in this industry now have to decide whether to use AI or not. With the help of Artificial Intelligence project managers seek to enhance decision-making, optimize workflows and increase the chances of project success. AI project management enhances project managers' abilities and knowledge empowering them to effectively manage projects with greater success and cost-efficiency.

The global market for AI in project management is projected to grow from USD 2.5 billion in 2023 to USD 5.7 billion by 2028, at a compound annual growth rate (CAGR) of 17.3% during the forecast period [1]. The following are a few benefits fueling this growth which lead to such growth:

Efficiency and automation: Artificial Intelligence frees up time for project managers and other experts to focus on more strategic tasks by eliminating repetitive tasks.

Data analysis and insights: AI can analyze vast volumes of data and the results can provide project managers with useful recommendations and incisive analysis.

Intelligent assistance and decision support: AI provides timely support and assistance with decision-making which can help project managers make better decisions more quickly.
Predictive planning and resource management: Because of its capacity to predict the future and allocate resources optimally, Artificial Intelligence has the potential to increase project completion effectiveness and efficiency.
Risk management and issue resolution: AI allows project and risk managers to proactively mitigate potential risks and issues.
Collaboration and communication: The potential of artificial intelligence to foster better teamwork and communication may lead to an overall increase in project delivery efficiency.

3.1 DEFINING AI IN PROJECT MANAGEMENT: EVOLUTION OF AI IN PROJECT MANAGEMENT

Beyond being a passing trend, artificial intelligence has a profound impact on project management revolutionizing the way professionals plan, carry out and complete the project. In the future, it has the potential to transform the field of project management by boosting productivity flexibility and the importance of data-driven decision-making. There are various phases to the evolution of AI project management and at each one of them, there are unique new capabilities and efficiencies. Focused on task automation the first phase arose in the 1980s. As a result, nowadays, resource allocation, scheduling, dependency tracking and other repetitive tasks are mostly automated by project managers using software such as Primavera and Microsoft Project. By saving time these tools enabled project managers to concentrate on more strategic matters.
Recently there has been an increasing use of chatbot assistants in project management. When used in conjunction with communication apps like Microsoft Teams or Slack these virtual assistants can answer frequently asked questions about projects, summarize decisions made at meetings and remind users of deadlines. Despite being a common sight in daily life, chatbots are still a relatively new tool for project management. They present an exciting opportunity to enhance cooperation and communication.
The power of machine learning defines the current phase. Artificial intelligence algorithms can now scan enormous amounts of historical project data to find trends and foresee possible problems. Project success and resource allocation are made easier by tools like Microsoft Power BI with Einstein Analytics and Oracle's machine learning-capable Primavera P6.
Through proactive problem-solving project managers can ensure a smooth project outcome. In the next phase of development, artificial intelligence will be the ultimate decision-maker in project management. These artificial intelligence partners could propose corrective actions to keep projects on schedule and dynamically modify project schedules and resource allocation based on performance data. Then project leadership would usher in a new era in which human expertise is freed up for risk-reducing strategic decision-making and the application of innovative problem-solving techniques. Therefore, project management ought to become increasingly data-driven and efficient as artificial intelligence progresses.

3.2 EXISTING AI TECHNIQUES APPLIED IN PROJECT MANAGEMENT

The quick development of artificial intelligence techniques in project management has significantly changed interaction with technology. These are the most widely employed AI techniques:
Machine learning (ML) is a core concept in artificial intelligence. By using this technique computers can be taught to identify patterns in data, collect knowledge from them and replace human judgment or prediction with AI predictions. The goal of machine learning models is to develop statistical models and algorithms that without explicit programming enable computers to improve performance over time.

Natural language processing or NLP has enabled automation to make it possible for systems to read, write and understand human language. Through the use of chatbots, virtual assistants and language translation software, artificial intelligence has made it easier for humans and machines to communicate.

Forecasting future events through machine learning and statistical data models is the focus of predictive analytics, a subset of advanced analytics. Analyzing historical data is necessary to spot patterns and trends that can be used to predict future occurrences.

Building artificial neural networks that are suited to particular tasks forms the foundation of the machine learning subfield known as deep learning. Deep learning models can be taught to perform classification tasks and recognize patterns in photos, text, audio and other various data.

3.3 STATISTICS DEMONSTRATING AI'S ADVANTAGES IN PROJECT MANAGEMENT (PMI RESEARCH)

In 2022 The PMI Sweden Chapter conducted a proactive survey named “Artificial Intelligence and Project Management” [1]. The survey composed of 18 questions shows an overview of the Project Management community’s interest, knowledge and usage of AI in the field.

The survey reveals intriguing insights and trends in Artificial Intelligence in Project Management. Based on the survey, it was found that the majority of respondents, 74% are either new to artificial intelligence or have little knowledge of the field, while 26% of respondents have good or proficient knowledge. It is encouraging to see that there is a market demand for AI in project management, with 78% of respondents wanting to learn more about it. Only a small percentage (2.11%) showed no interest at all.

The areas where project management practitioners hope to receive assistance from AI are also worth noting. Many of them expect AI to automate repetitive and mechanical tasks like data collection and reporting. The inclusion of scheduling, risk management, and cost management is also significant, as these areas can easily implement AI tools due to their reliance on simple tabular and numerical data.

Looking ahead, the majority of participants express optimism regarding the influence of artificial intelligence on their daily tasks as project managers. However, 66% of those surveyed think the impact will be somewhere between moderate and moderately high. Only 10% of respondents are enthusiastic about new approaches to work and 23% are indifferent.

The survey indicates that about 27% of participants have already applied AI in their work. This percentage could double to 48% in the next three years with continued efforts. According to earlier studies, companies that have invested in and used AI have seen an average 15% increase in productivity. These results ought to act as a wake-up call for those who are falling behind given the trends of globalization, the expansion of online commerce and digitization.

4 ETHICAL CHALLENGES IN AI IMPLEMENTATION IN PROJECT MANAGEMENT

With its capacity to automate monotonous tasks, enhance decision-making skills and expedite processes artificial intelligence presents enormous potential for revolutionizing project management. However, as AI is used more often in the workplace project managers will have to deal with the ethical issues raised by its effects. Like any other powerful technology, artificial intelligence has inherent risks if it is not implemented carefully. Data privacy, biased algorithms, fairness and unaccountable systems are just a few of the problems that can cause project delays and even undermine human expertise. This proactive approach makes using AI ethics not just vital, but essential for the future of successful project management.

4.1 ETHICAL DILEMMAS IN AI: PRIVACY, BIAS, AND ACCOUNTABILITY

Data-centric AI is revolutionizing project management. By evaluating enormous amounts of previous project data artificial intelligence can identify and mitigate risks, optimize resource allocation and predict obstacles. Nonetheless, this data-driven strategy raises pressing ethical privacy concerns. In this era of heavily processed personal data by AI, concerns regarding consent data ownership and potential surveillance are more urgent. To address this, strong data governance and AI techniques that protect privacy are essential.

Another challenge is that AI-driven project management systems may become biased. It is possible for AI systems to inadvertently introduce these biases into the training data. To decrease this risk a two-pronged approach is necessary. Making sure that objective data is used is crucial above all else. A comprehensive process of data auditing is necessary to identify and correct any potential representational imbalances in the datasets used to train AI project management tools. The development and design of the AI algorithms themselves require a second profound consideration.

Furthermore, transparency is critical to AI-driven project management to uphold accountability and foster trust. Project stakeholders must understand the logic behind recommendations generated by artificial intelligence, especially those concerning project delays. When there is a lack of transparency in the creation and use of AI tools, trust can be damaged and it can be difficult to hold people accountable for unforeseen consequences. To successfully navigate this complicated terrain clear guidelines for the responsible application of AI in project management must be created and implemented. These regulations must outline moral guidelines for the application of AI and outline the procedures for appealing decisions made by the technology.

4.2 IMPACT ANALYSIS: ETHICAL CHALLENGES' EFFECT ON PROJECT MANAGERS

Artificial Intelligence is revolutionizing Project Management raising both efficiency promises and serious societal concerns. Team dynamics and outcomes are shifting due to AI. A major concern that undermines public confidence and raises questions about the security of personal data is the possibility of data privacy violations in AI systems. Governments and businesses have responded to this by calling for more transparency and stronger data protection laws. AI's potential to widen socioeconomic and racial gaps and reinforce prejudices is another issue. Concerning the allocation of resources and the prioritization of tasks this is particularly concerning. In the absence of safeguards, biased AI algorithms have the potential to obstruct progress and promote injustice by favouring specific groups. Robust accountability frameworks are required in AI-powered project management to address these issues, reduce biases, guarantee transparency and provide recourse in the event of errors or misuse. In order to foster inclusivity and trust in the digital age ethical considerations must be prioritized.

5 BALANCING BENEFITS AND RISKS

In the dynamic realm of AI-powered project management, the task of balancing the remarkable benefits with the potential ethical risks presents a critical challenge. Effective use of AI technologies requires striking a careful balance between upholding public trust and avoiding unintended consequences that could jeopardize project success. The advantages of AI include enhanced decision-making, efficiency improvements, and innovative solutions, but these are weighed against privacy violations, biased outcomes and accountability concerns.

5.1 STRATEGIES FOR ETHICAL BALANCE IN AI

Ethical design principles must be integrated from the outset to maintain an ethical balance when developing AI-powered project management tools. This entails giving accountability, fairness and

transparency a top priority. Developers can prevent potential biases and guarantee that AI systems are intelligible and explicable by incorporating these principles into the design process beforehand. Furthermore, complex AI decisions within the project context can be made more transparent and intelligible for project managers and stakeholders by utilizing “explainable AI” (XAI) [14] methodologies. In addition to fostering team trust, this enables better-informed decision-making based on both human expertise and AI insights.

Without robust data governance privacy concerns cannot be adequately addressed by AI-powered project management. To achieve this stringent policies governing the gathering, archiving, processing and sharing of project data must be put into place. Methods such as “federated learning” and “differential privacy” [15] allow AI systems to learn from big project datasets without compromising the privacy of the individual user. If data collection follows informed consent guidelines and transparency principles as well as legal requirements project team members will gain greater trustworthiness.

In order to identify and resolve bias in AI-powered project management tools extensive strategy throughout the system's life cycle is required. Making sure the project data is varied and appropriately represents a variety of project types, team configurations and historical outcomes is essential to achieving this. Algorithms made expressly to detect and address bias in project data can be used to further reduce distorted results. Moreover, regular audits of the AI systems outputs are crucial to guarantee objectivity and ethical decision-making throughout the project, particularly in sensitive areas like risk assessment and resource allocation.

Fully utilizing AI in project management, while minimizing risks, requires cooperation across disciplines. A well-rounded approach is fostered by involving ethicists experts in data privacy and project stakeholders throughout the development process. This diversity of perspectives can guarantee that AI-powered solutions are both technically and ethically sound for the particular project. By identifying possible hazards, like prejudice in resource allocation or unforeseen consequences on team dynamics, a multidisciplinary approach can promote more moral and effective project execution.

5.2 CURRENT REGULATORY FRAMEWORKS IN AI

The legal environment around artificial intelligence in project management is changing right now because the laws that are in place are not keeping up with the speed at which technology is developing. AI systems that process the personal data of European Union citizens are impacted by the “General Data Protection Regulation (GDPR)” which establishes a precedent for data privacy in the EU. This regulation places a strong emphasis on consent data minimization and the right to explanation—all of which are important for AI accountability and transparency. In Kazakhstan, general guidelines for data collection processing and user consent are outlined in the 2013 “Law of the Republic of Kazakhstan on Personal Data and its Protection” which governs data privacy. However, there are governance gaps because these current regulations frequently do not keep up with the quick advances in AI technology.

6 ETHICAL FRAMEWORKS

Ethical frameworks are crucial for navigating the intersection of AI and project management. These frameworks offer guiding concepts to make sure AI-powered project tools align with ethical considerations and promote ethical outcomes. Through the standardization of ethics across project life cycles they provide a framework for resolving possible issues like decision-making biases, data privacy and accountability for project outcomes.

6.1 EXPLORING ETHICAL FRAMEWORKS FOR INTEGRATING AI INTO PROJECT MANAGEMENT PRACTICES

Utilitarian and deontological theories have a significant impact on the ethical concerns surrounding the integration of AI in project management. Because utilitarianism emphasizes the

consequences of actions, AI research focuses on maximizing overall benefits or minimizing negative effects. Based on this viewpoint AI systems are made to rank tasks in order of importance that maximizes benefits for project stakeholders. This technique requires AI systems to strictly abide by ethical mandates like preventing harm and protecting user privacy regardless of potential project benefits.

A different perspective on AI in project management is offered by **virtue ethics**. Virtue ethics which emphasize an agent's moral character and attributes may prove advantageous for the advancement of AI. This technique could aid in the creation of AI systems that stand for moral values like justice, empathy and accountability. In this instance creating AI systems with desirable intrinsic features and functionalities is just as important as making the appropriate decisions.

Ethical AI practices are significantly shaped by **principle-based frameworks** that are founded. As an example consider the well-known Asilomar AI Principles which provide guidelines for R&D projects. These moral precepts which include ideas like beneficence, non-maleficence and fairness give the use of AI a moral foundation. These frameworks for defining principles act as a set of guidelines for AI system developers and users in project management guaranteeing moral conduct and sound judgment throughout the project lifetime.

Implementing ethical Artificial Intelligence requires the use of **contextual frameworks** in project management. These frameworks recognize that various user groups and application cultures bring up various ethical dilemmas. By attending to context-specific ethical considerations these frameworks ensure AI systems comply with the specific requirements and values of diverse project environments.

6.2 BUILDING ETHICAL AI: A FRAMEWORK FOR TRANSPARENCY, FAIRNESS, AND ACCOUNTABILITY

Project managers must ensure that AI systems are transparent to give stakeholders access to information about how they operate internally. Explainable AI (XAI) technologies can help project teams in comprehending how AI models make procedures such as task prioritization and resource allocation [14]. To enable people to make educated decisions, transparency also entails disclosing biases and flaws.

Fairness is crucial if artificial intelligence systems are to prevent aggravating project management bias. One way to lessen biases in AI training is to use representative and diverse datasets. Biased results must be found and fixed using fairness metrics and continuous monitoring in order to guarantee that all project stakeholders receive equal treatment.

Project managers require precise procedures for holding users and developers of AI systems accountable. Legal frameworks that address negligence or misuse must be established in addition to guidelines for the responsible development of AI. Additionally, to ensure accountability within project management processes, channels of recourse and feedback must be established if AI systems make mistakes.

Project managers ought to adhere to the ethical principles that steer the development of artificial intelligence in project management environments. Values like accountability, transparency and equity guarantee the achievement of project objectives through the integration of ethical principles with AI systems. The development of ethical AI and responsible project management methodologies can be aided by collaboration between ethics experts, stakeholders and project teams.

Incorporating these considerations into project management processes ensures that AI technologies improve project results while maintaining stakeholder trust and ethical standards.

7 FUTURE DIRECTIONS

As we stand at the forefront of an AI-powered project management revolution, it's critical to consider the ethical path forward for AI in this domain.

7.1 FORECASTING CHALLENGES AND OPPORTUNITIES IN ETHICAL AI

More sophisticated Artificial Intelligence applications raise complex moral questions that need to be addressed. As AI systems take on more complex project tasks one of the main concerns is making sure that decisions are made fairly and impartially. Keeping security and privacy intact also becomes critical at a time when AI is processing enormous amounts of project data quickly and thoroughly. In addition to technological developments establishing thorough ethical standards and strong regulatory frameworks are also necessary to address these issues.

Nonetheless, the advancement of AI offers unique opportunities to enhance ethical practices in project management. Through the detection of subtle patterns that human auditors might overlook, artificial intelligence can recognize and mitigate biases in a variety of project domains including resource allocation and task prioritization. By precise decision-making and targeted interventions, artificial intelligence has the potential to advance society in the field of project management and improve project outcomes.

However, in the future project managers must find a way to balance innovation and ethical responsibility. Maintaining moral standards while advancing AI development requires collaboration between developers, ethicists, policymakers and project stakeholders. To create AI technologies that are both incredibly effective and compliant with moral and ethical project management principles collaboration will be essential.

8 CONCLUSION

In the context of Project Management, the paper examined the ethical implications, difficulties and opportunities for the responsible development of artificial intelligence. There are clear advantages to using AI in project management in terms of advancement and productivity but there are also serious ethical concerns. The transparency of AI decision-making, systematic bias and data integrity and privacy are a few of these concerns. The paper's central thesis highlights the significance of successfully addressing these issues. To properly overcome these challenges there is a need for a multidisciplinary strategy that considers moral standards, regulatory frameworks and technical developments.

In conclusion, everyone involved in the AI ecosystem has a responsibility to act. For researchers and developers of AI accountability and transparency in research ethics should be of utmost importance. Legislators and authorities ought to enact strong data privacy laws along with moral standards. Industries and businesses should adopt moral AI governance. To support the development of ethical AI people should be aware of and supportive of these issues.

The journey toward ethical AI in project management is not a solitary endeavour but a collective one. It necessitates collaboration, vigilance, and an unwavering commitment to ensuring that AI advancements align with ethical principles and uphold human values.

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КЛАСТЕРНАЯ СТРАТЕГИЯ КАК ОРИЕНТИР ЭКОНОМИЧЕСКОГО РАЗВИТИЯ РЕГИОНА В АГРАРНОМ СЕКТОРЕ КАЗАХСТАНА

Ткачева Анастасия Игоревна

PhD докторант, Университет Туран Астана (г. Астана)

Насырова Анар Мирамбековна

магистр экономических наук, старший преподаватель, Университет Туран Астана (г. Астана)

Аннотация. Кластерная стратегия представляет собой эффективный инструмент ориентации экономического развития региона, особенно в аграрном секторе. В контексте Казахстана, с его обширными аграрными ресурсами, внедрение кластерной стратегии может способствовать увеличению производительности, конкурентоспособности и устойчивости сельскохозяйственного сектора. В данной статье рассматривается потенциал кластерной стратегии в контексте развития аграрного сектора региона Казахстана. Основываясь на концепции кластеров, их преимуществах и примерах успешной реализации в мировой практике, рассмотрены возможности и выгоды внедрения кластерной стратегии в аграрном секторе Казахстана.

Кластерная стратегия позволяет объединять ресурсы, знания и опыт различных участников цепи производства и обработки сельскохозяйственной продукции, что способствует созданию целостной и сбалансированной инфраструктуры. кцент сделан на потенциале увеличения эффективности производства, расширения рынков сбыта, улучшения качества продукции и привлечения инвестиций через формирование аграрных кластеров. В результате формирования аграрных кластеров возможно повышение эффективности использования ресурсов, сокращение издержек, расширение рынков сбыта и создание новых рабочих мест. Поддержка государственных и частных инвестиций, развитие инноваций и повышение качества образования играют важную роль в успешной реализации кластерной стратегии в аграрном секторе Казахстана.

Ключевые слова: кластер, экономика, аграрный сектор, кластерная стратегия, продовольственная безопасность, сельские территории, государственное регулирование.

Кластерная стратегия развития сельского хозяйства в регионе представляет собой важный инструмент государственного регулирования, направленный на повышение эффективности и конкурентоспособности аграрного сектора [1]. Сельское хозяйство является одной из ключевых отраслей экономики многих стран, особенно тех, где оно играет важную роль в обеспечении продовольственной безопасности и содействии социально-экономическому развитию сельских территорий.

Кластерная стратегия основана на принципе объединения схожих предприятий, организаций, институтов и органов управления в определенном регионе с целью создания благоприятных условий для совместной работы и развития. В контексте сельского хозяйства кластеры могут включать в себя фермерские хозяйства, предприятия по переработке сельхозпродукции, научно-исследовательские учреждения, образовательные институты, поставщиков сельскохозяйственной техники и другие заинтересованные стороны.

Целью данной статьи является рассмотрение кластерной стратегии как метода регулирования государства в сельском хозяйстве. В частности, будет проанализировано, какие механизмы и инструменты могут быть использованы государством для стимулирования развития сельскохозяйственных кластеров, а также какие выгоды и вызовы сопутствуют этому подходу.

Актуальность статьи заключается в применения кластерной стратегии в сельском хозяйстве, особенно в контексте современных вызовов, таких как изменение климата, демографические изменения, устойчивое использование ресурсов и обеспечение продовольственной безопасности.

Статья предоставляет практические рекомендации для государственных и региональных органов власти, сельскохозяйственных предприятий и других заинтересованных сторон по внедрению кластерной стратегии развития. Это поможет понять, какие конкретные шаги можно предпринять для создания и развития сельскохозяйственных кластеров в регионах.

Научная значимость основана на актуальных научных исследованиях и публикациях в области экономики сельского хозяйства, кластерного развития и государственного регулирования. Это обеспечит научную обоснованность и достоверность представленной информации.

Аграрный сектор Казахстана играет важную роль в экономике страны, особенно в регионах, где сельское хозяйство является основным источником дохода [2]. В условиях глобализации и растущей конкуренции на мировых рынках, эффективное развитие аграрного сектора становится приоритетом для многих региональных властей. В этой связи кластерная стратегия может быть важным ориентиром для стимулирования экономического развития в аграрном секторе.

Казахстан, как страна с обширными сельскохозяйственными ресурсами, придает особое значение развитию своего аграрного сектора. В этом контексте кластерная стратегия представляет собой важный инструмент, который может способствовать эффективному использованию ресурсов, увеличению конкурентоспособности и стимулированию инноваций в аграрном секторе Казахстана [3].

Кластерная стратегия подразумевает объединение схожих по производственной специализации предприятий, организаций и институтов в определенном регионе. Эти кластеры могут включать в себя сельскохозяйственные предприятия, производителей сельскохозяйственной техники, поставщиков семян и удобрений, а также научные и исследовательские институты.

Кластерная стратегия в аграрном секторе основана на принципах совместной работы различных участников цепочки производства - от сельскохозяйственных предприятий до производителей оборудования и поставщиков услуг [4]. Основные принципы кластерной стратегии в аграрном секторе включают:

Создание совместного пространства: Формирование кластеров, где компании могут взаимодействовать, обмениваться опытом и ресурсами, а также совместно решать проблемы и разрабатывать инновационные решения.

Стимулирование инноваций: Поддержка и развитие инновационной деятельности в аграрном секторе, включая внедрение новых технологий, методов управления и производства.

Развитие инфраструктуры: Обеспечение доступности качественной инфраструктуры для сельскохозяйственных предприятий в кластере, включая транспортные маршруты, складские помещения и обработку сельскохозяйственной продукции.

Повышение конкурентоспособности: Содействие развитию конкурентоспособных сельскохозяйственных предприятий в кластере путем обмена опытом, обучения персонала и доступа к рынкам сбыта.

В современных условиях глобализации и интенсивного конкурентного давления кластерная стратегия становится всё более актуальным и эффективным инструментом для стимулирования экономического развития регионов, особенно в сфере сельского хозяйства [5]. В Казахстане, с его обширными аграрными ресурсами и значительным вкладом агропромышленного сектора в экономику, кластерная стратегия может играть ключевую роль в обеспечении устойчивого и инновационного развития сельских регионов.
Основные аспекты кластерной стратегии как ориентира экономического развития аграрного сектора Казахстана представлены на рисунке 1.

Рисунок 1 - Основные аспекты влияния кластерной стратегии
Примечание – Составлено авторами

В целом, кластерная стратегия представляет собой перспективное направление для ориентирования экономического развития регионов в аграрном секторе Казахстана. Это позволяет повысить конкурентоспособность отрасли, создать благоприятные условия для развития бизнеса и привлечь новые инвестиции, что в конечном итоге способствует устойчивому экономическому росту и повышению благосостояния населения сельских регионов [6].
Эффективная реализация кластерной стратегии в аграрном секторе Казахстана требует согласованных действий со стороны правительства, бизнес-сообщества и академических институтов. Поддержка со стороны государства в форме налоговых льгот, субсидий и инфраструктурных проектов также может сыграть ключевую роль в успешной реализации кластерной стратегии в аграрном секторе Казахстана [7].
За годы рыночных реформ в Казахстане проведена большая работа по либерализации экономической деятельности, совершенствуются методы государственного регулирования экономики, внедряются инновационные механизмы ведения бизнеса, осуществляются реформирование отраслей инфраструктуры.
В свою очередь, инновационное развитие системы национальной экономики требует прогрессивных форм организации производства. В этом аспекте для повышения эффективности производства и конкурентоспособности экономики важную роль играет изучение вопросов формирования и развития кластеров в системе национальной экономики Казахстана.

Государственное регулирование развития кластеров является важным инструментом для поддержки и стимулирования развития экономики на местном и региональном уровнях [8]. Ниже на рисунке 2 представлены основные методы государственного регулирования развития аграрных кластеров.

Рисунок 2 – Государственное регулирование развития кластеров АПК
Примечание – Составлено авторами

Таким образом, кластерная стратегия представляет собой эффективный инструмент для стимулирования экономического развития региона в аграрном секторе. Путем создания благоприятной среды для сотрудничества и инноваций кластеры способствуют увеличению производства, улучшению качества продукции и повышению конкурентоспособности сельскохозяйственных предприятий [9].

На основе проведенного исследования можно сделать вывод о том, что кластерная стратегия является эффективным инструментом для ориентирования экономического развития регионов в аграрном секторе Казахстана [10]. Реализация кластерных инициатив может способствовать созданию благоприятной среды для развития сельскохозяйственных предприятий, привлечению инвестиций и содействию устойчивому росту отрасли.

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Виды и методы моделирования бизнес-процессов для обеспечения продовольственной безопасности

Кусаинова Лариса Ислямовна
кандидат экономических наук, ассоциированный профессор, профессор института управления Академии государственного управления при Президенте Республики Казахстан
Есмагамбетов Даулет Бекбатырович
доктор по образовательной программе «Государственное управление»
Жунусова Асель Жумаевна
доктор по профилю Экономика, доцент института управления Академии государственного управления при Президенте Республики Казахстан

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Проблемы обеспечения продовольственной безопасности связаны как с природой функционирования аграрного сектора экономики, так и с системой управления по достаточности и качества продуктов питания. Для разрешения данных проблем актуализируется процесс моделирования бизнес-процессов.

Моделирование бизнес-процессов прочно вошло в практику выполнения проектов по развитию как промышленного, так и аграрного бизнеса. Модель бизнес-процессов позволяет существенно облегчить решение следующих задач:

-задачи реорганизации бизнеса, обусловленной переходом от функциональной модели к процессной;

-задачи использования информационных систем для управления бизнесом предприятия; задачи по сертификации систем менеджмента качества [1].

Модель бизнес-процессов сельскохозяйственного предприятия позволяет описать и скорректировать будущую систему до того, как она будет реализована физически, позволяет уменьшить затраты на создание, а также оценить работы по времени и результатам, достичь взаимопонимания между всеми участниками проекта, включая и государство, и население.

Построенные модели бизнес-процессов являются не просто промежуточным результатом, используемым для выработки каких-либо рекомендаций и заключений. Они представляют собой самостоятельный результат, имеющий большое практическое значение, в частности:

– модели позволяют осуществлять автоматизированное и быстрое обучение новых работников конкретному направлению деятельности предприятия;

– с помощью моделей можно осуществлять предварительное моделирование нового направления деятельности с целью выявления новых потоков данных, взаимодействующих подсистем и бизнес-процессов (переработка продукции и т. п.).

Внедрение процесса моделирования в систему государственного управления является одним из процессных подходов к организации государственного управления.

Процессный подход к организации управления бизнесом является современным подходом к построению систем управления и требует адекватной поставленным сельскохозяйственной организацией целям системы сбора, обобщения, обработки и анализа информации в разрезе бизнес-процессов.

Важное значение приобретает согласование различных бизнес-процессов в рамках сельскохозяйственной организации, рассматриваемой в качестве экономической системы. Для этого в свою очередь необходима четкая идентификация бизнес-процессов внутри экономической системы. Идентификация бизнес-процессов позволит определить потребности в информации о них, а также сформировать адекватную реализуемой сельскохозяйственной организации стратегии систему контроля бизнес-процессов на основе их учета и анализа.

Бизнес-процесс представляет собой совокупность взаимосвязанных операций, направленных на получение определенного результата, с указанием начала и конца, точным определением входов, выходов, механизмов исполнения и управления

Бизнес-процессы целесообразно использовать при реструктуризации сельскохозяйственной организации и/или смене собственников, а также внедрении новых подходов к управлению; снижении эффективности деятельности и управлении организацией или отдельными видами деятельности; отсутствии прозрачности осуществления бизнес-процессов и распределения ответственности за результат и т.д. Также необходимо помнить о проблемах операционного характера: необходимость увеличения объемов производства, значительные издержки, снижение качества, высокая длительность операций; подготовка к внедрению системы менеджмента качества; значительный неконтролируемый рост численности персонала; подготовка к упорядочиванию информационных потоков и автоматизации деятельности сельскохозяйственной организации; совершенствование системы документационного обеспечения управления.

Взаимодействие государственных органов и бизнес-структур приводит к тому, что в данном процессном подходе именно цифровые технологии окажут полное содействие по оперативности получения данных и принятия оптимального решения.

Особенности предприятий АПК, обусловленные спецификой перерабатываемого сырья, получаемого готового продукта, используемой материально-технической базы, технологии производства, определяют наиболее критичные области регулирования бизнес-процессов: анализ рынка и потребностей потребителя; разработка концепции и стратегии бизнеса; производство и его обеспечение ресурсами; хранение готовой продукции; организация сбыта продукции.

Таким образом, определяющей цепочкой бизнес-процессов является следующая цепочка: исследование → разработка → внедрение → производство → продвижение → распределение.

Бизнес-процессы как последовательность работ, осуществляемых на предприятиях, формируются, исходя из жизненных циклов продуктов. Основных стадий жизненного цикла продуктов питания в предлагаемой модели насчитывается семь[2.]:

– исследование рынка – выявление потребностей потребителей;

– разработка или модификация – придание существующим продуктам новых качеств, новых свойств, соответствующих требованиям потребителей, или разработка абсолютно новых товаров;

– прогнозирование потребностей и возможностей, внедрение – определение вероятных потребностей в сырье, основных и вспомогательных материалах; поиск и выбор поставщиков; установление с ними хозяйственных связей;

– производство – физическое создание продукта, информирование рынка потребителей о его появлении, изменении потребительских свойств;

– продвижение на рынок – рыночное событие, выраженное оформленной потребностью индивидуального потребителя в продукте;

– отгрузка покупателю – доставка товаров в торговую сеть;

– продажа через собственную сбытовую сеть.

Эти семь основных стадий жизненного цикла формируют семь основных сквозных процессов, проходящих на предприятии агропромышленного производства.

Таким образом, все бизнес-процессы АПК характеризуются маркетинговыми событиями (спрос и предложение) на границах бизнес-системы, что позволяет в рамках моделирования реализовывать концепции маркетинга для действующих на рынке предприятий.

Моделирование бизнес-процессов по ходу работы продолжает изменяться и совершенствоваться, поэтому модели процессов должны регулярно пересматриваться и улучшаться. Моделирование бизнес-процессов может иметь различную направленность. Это зависит от того, какие проблемы предполагается решить с его помощью. Учет абсолютно всех воздействий на процесс может значительно усложнить модель и привести к избыточности описания процесса. Чтобы этого избежать, моделирование бизнес-процессов разделяют по видам.

Вид моделирования выбирается в зависимости от исследуемых характеристик процесса.

Для целей совершенствования процесса применяют следующие виды моделирования:

– Функциональное моделирование. Этот вид моделирования подразумевает описание процессов в виде взаимосвязанных, четко структурированных функций.

– Объектное моделирование – подразумевает описание процессов, как набора взаимодействующих объектов – т.е. производственных единиц.

– Имитационное моделирование – при таком виде моделирования бизнес-процессов подразумевается моделирование поведения процессов в различных внешних и внутренних условиях с анализом динамических характеристик процессов и с анализом распределения ресурсов.

На сегодняшний день существует достаточно большое количество методов моделирования бизнес-процессов. Эти методы относятся к разным видам моделирования и позволяют сфокусировать внимание на различных аспектах. Они содержат как графические, так и текстовые средства, за счет которых можно наглядно представить основные компоненты процесса и дать точные определения параметров и связей элементов.

Моделирование бизнес-процессов выполняют с помощью следующих методов[3%]:

– Flow Chart Diagram (диаграмма потока работ) – это графический метод представления процесса в котором операции, данные, оборудование процесса и пр. изображаются специальными символами. Метод применяется для отображения логической последовательности действий процесса.

– Data Flow Diagram (диаграмма потока данных). Диаграмма потока данных или DFD применяется для отображения передачи информации (данных) от одной операции процесса к другой. DFD описывает взаимосвязь операций за счет информации и данных. Этот метод является основой структурного анализа процессов, т.к. позволяет разложить процесс на

логические уровни. Каждый процесс может быть разбит на подпроцессы с более высоким уровнем детализации.

– Role Activity Diagram (диаграмма ролей). Она применяется для моделирования процесса с точки зрения отдельных ролей, групп ролей и взаимодействия ролей в процессе. Роль представляет собой абстрактный элемент процесса, выполняющий какую-либо организационную функцию.

– IDEF (Integrated Definition for Function Modeling) – представляет собой целый набор методов для описания различных аспектов бизнес-процессов (IDEF0, IDEF1, IDEF1X, IDEF2, IDEF3, IDEF4, IDEF5).

Эти методы строятся на базе методологии SADT (Structured Analysis and Design Technique).

– IDEF0 – позволяет создать модель функций процесса. На диаграмме IDEF0 отображаются основные функции процесса, входы, выходы, управляющие воздействия и устройства, взаимосвязанные с основными функциями. Процесс может быть декомпозирован на более низкий уровень.

– IDEF3 – этот метод позволяет создать «поведенческую» модель процесса. IDEF3 состоит из двух видов моделей. Первый вид представляет описание потока работ. Второй – описание состояний перехода объектов.

– Цветные сети Петри – этот метод представляет модель процесса в виде графа, где вершинами являются действия процесса, а дугами события, за счет которых осуществляется переход процесса из одного состояния в другое. Сети Петри применяют для динамического моделирования поведения процесса.

– Unified Modeling Language (UML) – представляет собой объектноориентированный метод моделирования процессов. Он состоит из 9 различных диаграмм, каждая из которых позволяет моделировать отдельные статические или динамические аспекты процесса. Большинство из указанных методов реализованы в виде программного обеспечения. Оно позволяет осуществлять поддержку бизнес-процессов или проводить их анализ. Примерами такого ПО являются различные CASE средства моделирования процессов.

Таким образом, моделирование бизнес-процессов позволяет учитывать особенности жизненного цикла продукта, вопросы бюджетирования и планирования работ.Методы позволяют моделировать деятельность практически любого предприятия АПК.

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The Importance Of Job Descriptions In Human Resource Management

Keso Sumbadze
PhD in business administration, Associate Professor Business and Technologies University

Modern Georgian organizations are facing many challenges. The rapidly changing environment requires a quick response and adapting to changes, in this process people employed in organizations play a crucial role, the effective management of which is quite difficult in the background of such global challenges as: international competition, the growing trend of talent outflow, complicated recruiting process and others. Retaining employees and increasing their satisfaction is possible by introducing modern management approaches and protecting the rights of employees.

As a result of the research conducted by us in order to study the challenges in human resources management practices, it was determined that in Georgian organizations it is often problematic to assign functions to employees incorrectly or to request them to perform additional work, which leads to employee dissatisfaction, reduced motivation and often the decision to leave the organization.

For the effectiveness of human resources management, it is important to distribute functions and responsibilities fairly and correctly among employees. Even at the pre-contractual stage, the employer is obliged to write in the competitive application the roles, responsibilities, qualification requirements, employment rules and conditions specific to the vacant position. After the competition stage, the contractual relationship begins, within the framework of which the employer is obliged to create an employment contract.

As a result of the conducted research, it was determined that often in pre-contractual relations, job descriptions are not fully announced in the competition application, therefore candidates do not know the roles and responsibilities provided for the job position. Contractual relations are also problematic, employees say that the contract often includes general functions, for example, "to perform the manager's tasks", although it is not fully explained what types of tasks or what volume of work can be assigned to them.

It is important for the employer to create, in compliance with the legal requirements, an employment contract, which is an agreement signed between the employer and the employee, on the basis of which the parties agree to the labor relationship, in particular, the rules, conditions and responsibilities of the work performed by the employee in exchange for remuneration to the employer under the conditions of the organizational regulation of labor. In the mentioned agreement, the job roles and functions of the employee should be written in detail, which should actually be imported from the already existing job descriptions in the organization.

A job description is a summary of the function-duties of a job position and the basic requirements of the position holder, identified through the job analysis process. The job description should be drawn up based on the information obtained as a result of an in-depth job analysis.

It is important that the job description includes the title of the position, the purpose of the job, duties, responsibilities, working conditions and the hierarchical location of the job position in the organization. It should be detailed, with clear explanations and include all the issues related to the employer-employee relationship. The employer must keep in mind the formal and informal purpose of the job description. The formal goal is for the employee to be clear from the start about

job functions, responsibilities, and to protect his rights, while the informal goal is to exchange the correct expectations between the employer and the employee.

Properly drafted job descriptions by an HR manager detail the position's responsibilities, provide an accurate picture of what kind of talent the organization needs, and how to develop and retain talent. The job descriptions must clearly state the methods by which the employee is evaluated and at what intervals. With the help of well-written job descriptions, fair compensation can be determined.

We can safely say that a well-visualized job description is an important tool for effective management Pató, B.S.G. (2017).

Managers can effectively use job descriptions in planning recruitment and selection, compensation, appraisals, training and development, and health and safety. During the full cycle of cooperation, the job description significantly helps the manager to effectively manage employees and perform such management functions as: planning, directing, organizing, controlling and staffing (Leon Rohr, S. (2016).

As a result of our research, we studied the process of creating job descriptions by 6 organizations and already created job descriptions. As a result of the research, it was established that 3 organizations do not have separate job descriptions, the functions and responsibilities for the job position are determined by the labor contract.

As a result of the research, it was determined that when creating job descriptions in research organizations, information is obtained from various sources, namely: as a result of employee surveys, as a result of interviews with managers, as a result of research conducted using different methods, by observing the work process of employees or by interviewing an expert in the field.

Research has shown that job descriptions include such parts as are typical for the position, such as: job title, working hours, workplace, brief job description, functions and responsibilities, powers, required qualifications, desired qualifications and working conditions. We did not find in the job descriptions, the evaluation method and basic guidance documentation, which we think is necessary.

Job description creation in research organizations is preceded by such stages of job analysis as:

- Planning - involves drawing up an action plan and defining deadlines for the activities to be implemented.
- Conducting communication - informing and training employees.
- Selection of respondents.
- Collecting and analyzing information.
- Approval of the final job description document.
- Introducing the job description to the new employee.

As a result of the research, it was determined that the periodic review and updating of job descriptions is almost never done, this practice definitely requires a change.

In relation to the problems identified as a result of the research, our recommendations are as follows:

- It is important to improve human resource management processes in organizations.
- It is important to use job descriptions in human resource management processes.
- The creation of job descriptions must be preceded by a job analysis process, which must be planned and implemented in a logical sequence.
- It is important to include in job descriptions, along with the other descriptions mentioned above, the job evaluation method and the list of guidance documents for the job position.
- It is important for employees to be familiar with job descriptions in detail.
- It is necessary to periodically review/update job descriptions in organizations.

In conclusion, we can say that the job descriptions created as a result of the effective implementation of the job analysis process play an important role in the effective management of human resources. Accordingly, the mentioned issue requires a serious approach and high standard management from the side of the organizations.

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Technology and Communication: The impact of technology on communication within project management

Nurgaliyev Yerkebulan
Master's student in project management, Kazakh-British Technical University, Almaty, Kazakhstan

ABSTRACT

Technology plays a key role in communication in the modern world. It is impossible to imagine a corporation without communication technologies. Effective communication builds trust and strengthens organizations. The results show that corporations are underutilizing task and control technologies. Critical equipment and technologies for mission success have been approved. The significance of the era in improving the decision-making process of participants is considered.

INTRODUCTION

Old methods of communication have been replaced by digital options. Handwritten letters have been replaced by emails, and digital platforms such as FaceTime, Zoom and Teams have taken over phone calls.

For any project, people, processes, and technology are vital success factors. The project manager must integrate these factors and use them efficiently (SPSF). In the globalized economy, organizations use various methods like outsourcing, remote engineering, and remote testing to optimize cost. Project management is becoming more complex, and managers are compelled to use advanced information technology tools. In addition to information technology tools, previous project lessons learned, historical reports, Know-how are emerging as the key supportive assets for project management [1].

LITERATURE REVIEW

Mcgrath and Kostalova (2020), in the publication: “Project Management Trends and new Challenges”, explored the current project management approach and examined required adaptation to remain relevant in the dynamic project-based organization. Both collected data from the PMO show held in Dublin, Ireland, on 7th Nov 2019. They used a qualitative research approach. Data from the literature review was also collected. The results indicate that project managers will need a new skill set in the technology-driven world of the future. The creation and usage of Hybrid mythologies customized to individual project requirements showed the increased project performance results. [2]

The 2016 Business Dictionary defines information technology as a collection of equipment, processes, and techniques. Associated devices used to collect, process, and present facts (e.g., encoding, programming, oral communication, transformation, storage and retrieval of information, evaluation and arrangement of gadgets, and Control systems). It covers automation, multimedia and telecommunications. Fast software, hardware and communications are used within the enterprise to collect statistics.

A variety of technologies and equipment are available that enable venture managers and teams to measurably improve task performance. Trello and Clarizen are enterprise management

systems designed to help the team, business manager, and client communicate instantly. Microsoft Team and Skype are increasingly being used for conferencing and communication.

BENEFITS OF TECHNOLOGY FOR PROJECT MANAGEMENT

The use of advanced information and communication technologies helps companies adjust their efforts in challenging environments. Communication technology has accelerated during the pandemic. Communication, or even the lack thereof, has an impact. The advantages of the era in communication include:

Save time and money: Innovative methods provide immediate communication, eliminating the need for lengthy face-to-face meetings or written correspondence. Email, messaging apps, and video conferencing make communication easier and faster, regardless of location or region.

Improved collaboration. The cloud-first era provides real-time collaboration systems that allow team members to work collaboratively seamlessly. Shared workspaces, project management mechanisms, and file sharing facilitate effective collaboration, productivity, and innovation.

Makes remote work easier. With the advent of remote art work, generation plays a vital role in maintaining verbal exchange and connection. Virtual conferences, teleconferencing, and remote collaboration enable powerful verbal exchanges among geographically dispersed corporations, promoting lifestyle flexibility and stability.

Usage of robotic process automation (RPA) will reduce the significant amount of time employees spend on repeated tasks, and instead team can concentrate on more critical tasks. Software applications enable the continued status of projects to be verified. Software tools are essential if any errors are to be identified and steps taken to rectify them. This measure promotes increased dynamism and provides an atmosphere conducive to innovation. Since the leader doesn't have to worry so much about regular or repeated tasks, they remain more open to seeing different possibilities, aiming to improve the team's performance. Usage of tools prevents time loss and increases production. If managers rely on business information in an organized and rapid manner, they can better to check what is ideal to achieve more expressiveness [2]

Sharing information creates better know-how and a higher level of communication between groups. This endeavor also contributes to the development of a sport that attracts unexpected and loyal customers. Keeping track of the trends of the era should be part of the activities of corporations that deserve respect for the quality of their services.

RESEARCH METHODOLOGY

The study used surveys, interviews, and various evidence-based resources. Scientific journals, congress articles, and technical blogs are used to accumulate facts that are bureaucratically considered a secondary source of statistics. Data from these resources has been considered because they are written by students and industry professionals. The survey was the number one source of information. The survey used interviews and questionnaires. Data was collected from hundreds of employees working in two different corporations: IT and non-IT. Participants included junior and senior-level employees in the positions of project managers, project administrators, lead engineers, senior engineers, and other team members. All answers are perceived as a separate source of information about a man or woman. Data from each IT employee and non-IT employee is combined for evaluation. The survey was conducted through questionnaires, after which the researcher did not disturb any of the employees who took part in the survey. The first set of questionnaires consists of simple information about people, such as the employee's name, age, company name, length of service, and current job. The second block includes issues related to the use of equipment and technology in the mission.

CONCLUSION

In the realm of project management, effective communication is pivotal for success. This paper explores the transformative impact of technology on communication within project management. By analyzing current literature and real-world examples, it examines how technology facilitates enhanced connectivity, streamlines information sharing, and fosters collaboration. The findings suggest that integrating technological solutions empowers project teams to communicate more efficiently, thereby improving productivity and project outcomes. As a result, work schedules can now be shared in real time. However, many companies underutilize existing tools and generation when implementing initiatives. Companies that don't embrace this era are much less likely to succeed.

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МЕСТО ТЕОРИИ ВЕРОЯТНОСТЕЙ В ШКОЛЬНОМ КУРСЕ МАТЕМАТИКИ

Демегенова Гулим Моряккызы
магистрантка, Жетысуский университет имени Ильяса Жансугурова

Аннотация: В нашей статье сделана попытка обоснования растущей актуальности изучение теории вероятностей и способов рассуждения ее в общей структуре научного мышления в рамках школьного обучения детей. Показано, что важно преподносить материал доступным и интересным образом, используя игры, практические примеры и задачи из реальной жизни мышления учащихся, которые существенно повышаются и требуют новых эффективных методов преподавания комбинаторики. Обоснованы основные задачи воспитания личности, могущие самостоятельно и критически мыслить, сопоставлять и анализировать факты, находить различные варианты решения возникающих проблем, выбирать из них оптимальные варианты в нынешних положениях всеобщего образования.

Ключевые слова: метод, постановка, вероятность, комбинаторика, мировоззрение, творчество, навыки, эксперимент, лаборатория, магистрант, интеллект, квалификация, саморазвитие, самоопределение, личность, исследование, проблема, проект, технология, семинар, конференция, кругозор, мышление, самоутверждение.

В настоящее время во многих областях естествознания и техники часто используются методы теории вероятностей. Автоматическое управление производственными процессами, создание автоматических радиолокационных станций и автоматических математических машин, автоматическое управление полетом самолета и другие автоматизированные и телемеханические, технические проблемы используют вероятностные методы. Теория вероятностей лежит в основе математической и прикладной статистики. А статистика помогает планировать и организовывать производство, анализировать технологические процессы, определять качество продукции, принимать правильные решения и эффективно управлять экономикой.

Передовые ученые первой половины XIX века поддержали внедрение теории вероятностей в учебные планы вузов. В результате в 1837 году теория вероятностей была введена в учебный план Санкт - Петербургского университета, а в 1850 году - в Московский университет [1] . В учебном плане Казахского государственного университета этот курс появился в 1933 году. В 1958 году теория вероятностей была включена в учебную программу педагогических институтов. В настоящее время теория вероятностей преподается не только в университетах, но и во всех технических, экономических, военных, финансовых учебных заведениях. Таким образом, вероятностно - статистический материал идея включения математики в школу хотя наука также развивалась около 50 лет и различные аспекты этой проблемы изучались в работах многих ученых - методистов, в наших школах, несмотря на опыт преподавания в школах во многих зарубежных странах, вероятностно-статистическое направление было введено в 2013 году. Это указывает на нерешенный характер этой проблемы во всем обществе и необходимость дальнейших исследований, в частности, научного обоснования отбора содержания в соответствии с современными требованиями,

изучения места этого материала в процессе математики. Происходящие в нашем обществе социально-экономические и политические изменения, современный уровень развития всех отраслей науки и техники подняли необходимость обучения в школе элементам теории вероятностей и математической статистики.

С середины прошлого века научно-педагогическое сообщество уделяет большое внимание развитию статистического мышления учащихся средних школ. Вопросы реформирования школьного математического образования, в частности включения в школьные программы элементов теории вероятностей и математической статистики, обсуждались на ряде международных научных форумов, международных математических конгрессах. В настоящее время элементы теории вероятностей и математической статистики включены в программы средних школ ряда зарубежных стран. Несколько лет назад вероятностно - статистическое образование было включено в курс математики венгерской школы.

В Европе методы обучения стохастике для учащихся средней школы берут свое начало в работе т. Варги , который первым предложил [2]. В национальных программах Англии и Шотландии много времени отводится изучению вероятностно-статистических материалов .Учащиеся начальной школы должны научиться группировать объекты, собирать и вводить данные в таблицу, выделять некоторые данные из таблицы, составлять и читать простые диаграммы, правильно использовать вероятностную терминологию, говорить о более или менее вероятностных результатах эксперимента. Заключительные требования к образованию старшеклассников показывают, что они владеют различными способами обработки и представления статистических данных, умеют работать с компьютерными базами данных, способны оценивать и вычислять простые вероятности.

От старшеклассников требуется проверка простых статистических прогнозов, анализ и интерпретация данных, представленных в различных формах. В период современных реформ в британских школах был предложен новый стандарт математического образования, основанный на формировании функциональной грамотности и компетенций учащихся. В связи с этим усилилась практическая направленность курса, поэтому возросла значимость вероятностно - статистического материала.

В Японии курс описательной статистики начинается в школе со второго класса, большое внимание уделяется пропедевтике, сбору данных, работе с таблицами и диаграммами [3]. В средней школе рассматриваются относительные и совокупные частоты, мода, медиана и среднее арифметическое ряда данных. Первоначальное представление о вероятности дается путем оценки возможности в наглядном виде,а также простой комбинаторики. Интерес представляют методы обучения вероятностно-статистическому материалу в школах США. Данный материал занимает одно из основных мест в общей школьной подготовке учащихся, находит продолжение при подготовке в университете многих специальностей, не связанных с математикой[4].

Одна из полезных сторон опыта США связана с 20 особенностями методической системы США, в которой практическое направление курса в школьном образовании в стране занимает первостепенное место.Если в других математических темах это привело к овладению знаниями, то при толковании стохастики такая методика прошла успешно и показала свои сильные стороны. Хотя американские ученики не показали высоких результатов по другим направлениям школьного курса математики, в области точной статистики и вероятности уровень образования и способностей американских школьников значительно выше [5].

Еще одна особенность методологий заключается в том, что статистика и вероятность преподаются отдельно друг от друга, не будучи изолированными от других школьных предметов, которые являются «мостом»к другим областям, таким как социальные

исследования и естественные науки. Что касается математики, эти разделы обычно включают использование понятий числа, измерения, оценки и решения проблем. В современном обществе понятие грамотности формируется и становится все более распространенным как мера, показатель любой деятельности. Например, музыкальная грамотность, техническая грамотность [6]. В этой связи можно выделить несколько видов функциональной грамотности:

1) грамотность чтения и письма;
2) математическая грамотность;
3) естественно - научная грамотность;
4) компьютерная грамотность;
5) грамотность в вопросах права и права и др.

Развитие функциональной грамотности требует новых подходов к оценке учебных достижений таких критериев, как знание – понимание – применение – система просеивания и обобщения. Такая система вводится путем всестороннего изучения мирового опыта. Они проводятся через национальные и международные системы оценки. В Казахстане интенсивно развиваются процедуры внешней оценки образовательных достижений обучающихся, такие как Единое национальное тестирование (бірыңғай) и внешняя оценка учебных достижений (ВОУД). Однако это не позволяет проводить сравнительный анализ качества образования наших образовательных школ и других стран [7] .

Задача 1. Даны 12 точек, где любые три не лежат вдоль одной и той же прямой. Сколько прямых, проходящих через эти точки, можно провести?

Решение. Поскольку через каждые две точки проходит только одна линия, а три точки не лежат на одной прямой, ответ на этот вопрос будет равен количеству циферблатов, состоящих из 2 из 12 элементов, то есть$C_{12}^{2} = \frac{12!}{2! \cdot 10!} = \frac{11 \cdot 12}{2} = 66.$ Ответ: 66.

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ОБ ОРГАНИЗАЦИИ ЛАБОРАТОРНЫХ РАБОТ ПО ФИЗИКЕ

Рахымбеков Айтбай Жапарович
к.ф-м.н., доцент, ассоцированный профессор, Жетысуский университет им.И.Жансугурова
Омирбеков Акылбек Оралбекулы
магистрант, Жетысуский университет им.И.Жансугурова

Аннотация: Рассмотрены основные виды лабораторных работ,выполняемых студентами образовательных учреждений по направлению «Физика» и методические указания по применению теоретические знаний, которые необходимо научиться применять практически, делая выводы. Указана структура лабораторной работы, которую можно разделить на несколько типов, как практический вид деятельности в процессе обучения студентов: репродуктивные, частично исследовательские, исследовательские. Предложен порядок оформления лабораторной работы.

Ключевые слова: лаборатория, проводник, таблица, чертеж, фронтальная, инструктаж, техника безопасности.

Лабораторная работа – это определенный вид практической деятельности, в ходе выполнения которого должны выполняться определенные действия студентами. Суть такого вида работы заключается в возможности более глубоко изучить материал, предусмотренный программой.

Практическая работа позволяет оценивать уровень подготовки ученика или студента более объективно, а сам учащийся при этом получает возможность применить все полученные знания и умения на практике. Кроме того, лабораторные работы носят еще и воспитательный характер, так как в ходе их выполнения, учащиеся начинают самостоятельно мыслить над теми или иными вопросами, принимать решения, делать выводы, понимать суть полученных знаний, проводить анализ, развивать целеустремленность и так далее[1].

Основные виды лабораторных работ:

В зависимости от того, какие задания предусматривает выполнение та или иная работа, она может быть представлена несколькими видами, отличающимися определенными показателями, характеристиками и структурными особенностями:

Иллюстративная, суть которой заключается в процессе изучения внешних характеристик исследуемого предмета и его структуры. Такой вид работы должен быть представлен в виде схем, рисунков, диаграмм, таблиц, чертежей. Исследовательская, в ходе которой участники проводят наблюдение за определенными процессами на протяжении N-го количества времени и делают записи полученных итогов в виде составления графика, схемы или рисунка.

Обобщающая, суть которой заключается в том, чтобы закрепить материал, полученный в ходе учебного процесса со всеми вытекающими выводами:

- проблемная, которая предусматривает нахождение варианта решения проблемы, заданной преподавателем. В основе такого вида работ лежат теоретические знания, которые необходимо научиться применять практически, делая выводы;

- фронтальная, в ходе которой все учащиеся выполняют одинаковые задания, обладая теоретическими знаниями;
- бригадно-лабораторная, выполнение которой осуществляется несколькими бригадами[2].

Ход лабораторной работы. Прежде чем приступить к процессу выполнения работы, каждый учащийся обязан ознакомиться с её планом. Информация, связанная с предстоящим исследованием, должна быть предоставлена преподавателем.

Студенты должны получить важную информацию по теме техники безопасности и правил поведения в лаборатории. Студенты должны понимать, что в лабораториях всегда имеются опасные реактивы и серьезное оборудование, неправильное использование которых может навредить не только себе лично, но и окружающим. Выслушав инструктаж по технике безопасности, каждый студент должен расписаться об ознакомлении с правилами поведения в лаборатории в специально предназначенном журнале.

Далее следует процесс выдачи методического материала, после чего можно приступать к проведению лабораторной работы. Если преподаватель сомневается в наличии у студента необходимого количества теоретических знаний для проведения лабораторной работы, он может устранить его от процесса.

Структура лабораторной работы

Лабораторные работы, как практический вид деятельности в процессе обучения, можно разделить на несколько типов:

- репродуктивные, в ходе выполнения которых студенты действуют по четко установленному регламенту работы. Прежде чем приступить к выполнению заданий, каждый студент получает методические пособники и приступает к изучению процесса предстоящей работы и знакомится с её результатами, которые должны получиться в конце;
- частично исследовательские, процесс работы которых не предусматривает наличие четких инструкций. В данном случае результат работы не известен, а студенты получают возможность самостоятельно выбрать метод решения поставленной задачи и оборудование, которым они будут пользоваться с целью получения конечного результата;
- исследовательские, цель которых направлена на решение проблем и задач, связанных с теорией.

Все лабораторные работы, проводимые в высших учебных заведениях, должны соответствовать ГОСТу с использованием методических пособников и указаний преподавателя [3]. Оформление лабораторной работы обязательным образом должно содержать в себе следующие элементы:

- титульный лист с описанием названия учебного заведения, кафедры, данные об учащемся и преподавателе, год выполнения и место проведения.
- оглавление, в котором идет перечень разделов.
- вводная часть.
- цель работы.
- краткая теория по выбранной теме.

Описание процессов проведения экспериментальной части.

- получение результата работы и его анализ.
- заключительная часть.
- перечень использованной литературы.
- лист с приложениями. Содержание лабораторной работы должно быть представлено тремя основными частями:
- вводная часть, которая должна содержать в себе общие понятия о работе и в чем заключается её актуальность. В этой части должна присутствовать пометка о том, какую пользу получит человек, применив полученные результаты на практике.

- основная часть, состоящая из теории и практики. И, если первая часть наполнена материалом с описанием ключевых фактов исследуемой области, то вторая часть должна содержать подробное описание процесса подготовки к проведению запланированных работ и непосредственно ход их действий.
- заключительная часть, цель которой состоит в предоставлении полученных результатов проведенных работ. В данной части целесообразно указать, были ли достигнуты поставленные цели и насколько ценными оказались полученные результаты.

Оформление текста лабораторных работ

Оформляя отчет о лабораторной работе, нужно использовать листы формата А-4 с информацией только на одной стороне. Написанный отчет прошивают и скрепляют скоросшивателем. Основными критериями правильного оформления текста отчета по лабораторной работе можно назвать:
- использование шрифта Times New Roman 12 размера.
- выравнивание текста отчета должно быть по ширине.
- межстрочный интервал – 1,5.Текст отчета лучше всего сразу разбить на разделы, учитывая структуру статьи. Лист с заголовком текста отчета должен быть оформлен соответствующими уровнями и выровнен по центру страницы. Страницы текста должны быть пронумерованы.

Правила оформления рисунков и таблиц в лабораторной работе

В ходе составления отчета о проведенной лабораторной работе могут быть использованы таблицы и рисунки. В обязательном порядке такая иллюстрация должна быть пронумерована своей отдельной сквозной нумерацией. Любой рисунок или таблица в ходе описания проведения лабораторной работы должны идти вместе с соответствующими пояснениями. Знание и четкое выполнение требований к оформлению лабораторной работы помогает студенту вовремя закончить работу и получить за неё заслуженно высокий балл. Кроме того, зная структуру лабораторной работы и основные правила её оформления, не придется переделывать работу, тем самым экономя собственное время[4].

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ANALYSIS OF THE EFFECTIVENESS OF HEAT TREATMENT IN IMPROVING THE WEAR RESISTANCE OF STEEL 12X18H10T

Y.Karimzhanov
Khoja Akhmet Yassawi International Kazakh-Turkish University, Turkestan, Kazakhstan

Annotation

This article examines the effect of various heat treatment modes on the hardness and friction characteristics of austenitic steel 12X18H10T. The study showed that quenching increases the microhardness of steel, while subsequent annealing leads to its decrease. It was also found that heat treatment generally increases the coefficient of friction of all test samples.

Introduction

Steel 12X18H10T is one of the most common types of austenitic stainless steel, which is widely used in various industries due to its outstanding corrosion properties and mechanical strength. However, in addition to corrosion resistance, important characteristics of the material are its wear resistance and tribological properties, which can vary significantly depending on the heat treatment conditions.

Heat treatment of steel, including quenching and annealing processes, is a key method of modifying its structure and, accordingly, properties. Quenching usually involves heating the steel to high temperatures followed by rapid cooling, which leads to an increase in the hardness and strength of the material. The firing following the quenching is aimed at reducing internal stresses and increasing the ductility and heat resistance of steel. [1]

The scientific community is constantly investigating the effects of various heat treatment modes on the physical and mechanical properties of materials, including hardness and friction. The purpose of this work is to investigate how different heat treatment modes affect the microhardness and coefficient of friction of 12X18H10T steel, which will improve understanding of the processes occurring in the material and contribute to the development of optimal processing modes for specific applications.

The method of the experiment

Standardized samples of 12X18H10T steel were used for the study, which were subjected to the above-mentioned heat treatment modes. Each sample was evaluated for changes in microhardness and coefficient of friction using specialized tools and techniques, including a microhardness meter and a tribometer. The data obtained were analyzed using statistical methods to determine the significance of the observed changes. [2]

Quenching at 1100 degrees Celsius for 60 minutes

This process involves heating 12X18H10T steel to a temperature of 1100 °C, which is significantly higher than the critical point of recrystallization of austenite, followed by rapid cooling. This technique is aimed at forming a martensitic structure that ensures maximum hardness and strength of the material.

Annealing at 900 degrees Celsius for 50 minutes

After quenching, the steel can be subjected to an annealing process at a temperature of 900 °C. This process is aimed at reducing internal stresses resulting from quenching and increasing

ductility and heat resistance. During the annealing process, a partial restoration of the austenitic structure occurs, which improves machinability and reduces the fragility of the material.

Annealing at 580 degrees Celsius for 60 minutes

This annealing is performed at a significantly lower temperature and is often used to achieve certain material properties, such as improving corrosion resistance and stabilizing the structure. Such an annealing mode can lead to a decrease in internal stresses without significant deterioration of mechanical properties, which is especially important for parts subject to corrosion. [3]

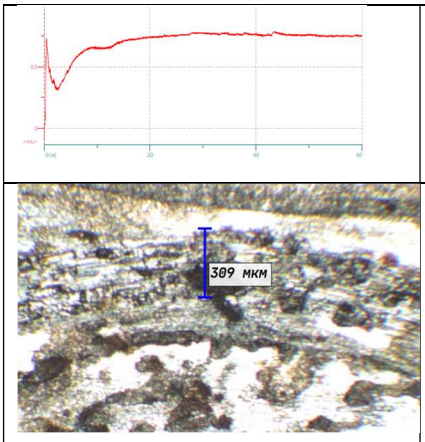
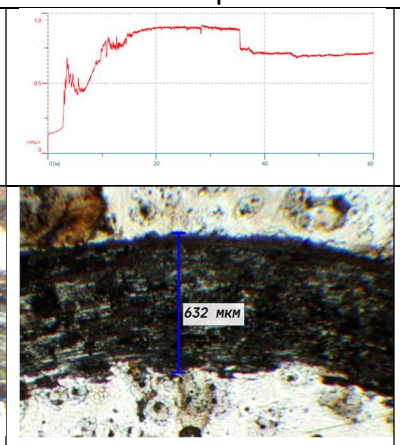
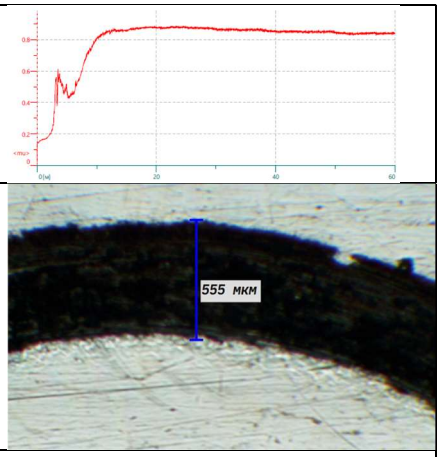
Results

The Vickers method for measuring microhardness was chosen because of its ability to accurately determine the characteristics of materials with varying degrees of hardness. The test uses a diamond indenter in the shape of a pyramid, which is pressed into the material under controlled load. The microhardness results for various 12X18H10T steel samples after heat treatment are presented below: [4]

1. Sample after quenching at 11000C: Microhardness was 254.3 HV at a load of 0.1 kg and an exposure time of 10 seconds. This value indicates a high level of hardness, which is typical for a martensitic structure formed as a result of rapid cooling.
2. The sample after quenching at 11000C and annealing at 9000C: The microhardness decreased to 182.3 HV, which indicates a decrease in internal stresses and an increase in plasticity due to partial restoration of the austenitic structure.
3. Sample after quenching at 11000C and successive annealing at 9000C and 5800C: Microhardness increased to 205.3 HV. This increase may be due to additional stabilization of the structure and reduction of internal stresses without significant deterioration of mechanical properties.

Table 1

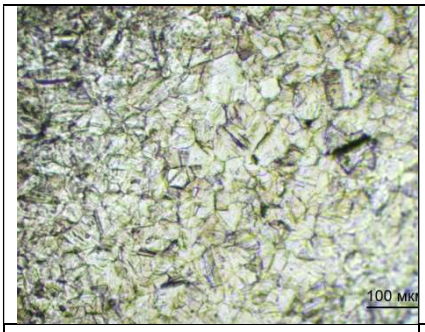
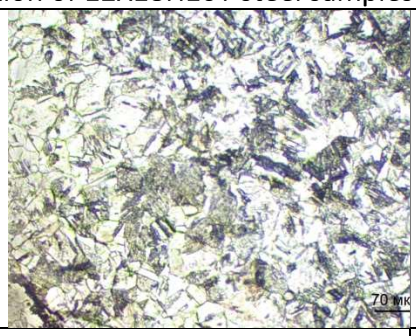
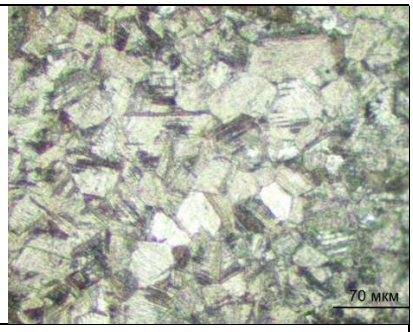
The coefficient of friction of steel samples 12X18H10T after heat treatment

		
Sample after quenching at 1100^{0}C	The sample after quenching at 1100^{0}C and annealing at 900^{0}C	The sample after quenching at 1100^{0}C and successive annealing at 9000C and 580^{0}C

From the graph of the coefficient of friction of 12X18H10T steel samples before and after heat treatment, it can be seen that the sample, after quenching at a temperature of 1100 ° C, shows a high coefficient of friction compared to the initial state. However, the subsequent stage of sample tempering leads to a decrease in the coefficient of friction to the level of the initial state. After quenching in the range of 900-580°Since there is a slight increase in the coefficient of friction of steel samples 12X18H10T. The subsequent release of these samples leads to a further increase in the coefficient of friction. [5]

Table 2

Microstructure of friction of 12X18H10T steel samples after heat treatment

		
Sample after quenching at 1100^{0}C	The sample after quenching at 1100^{0}C and annealing at 900^{0}C	The sample after quenching at 1100^{0}C and successive annealing at 9000C and 580^{0}C

In the presented drawings of the microstructure of 12X18H10T steel, it can be seen that at a temperature of 900 ° C-580 ° C, long inclusions of carbides both were and remained. There are almost no changes in the structure. And at a temperature of 1100 ° C, needle inclusions of carbides become more rounded and begin to dissolve. Obviously, in order to completely dissolve carbides, it is necessary to increase the holding time.

Conclusion

These results allow us to evaluate the effect of temperature and heat treatment time on the structural and mechanical properties of austenitic steel, which is key to optimizing production processes and improving the quality of the final product.

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Legal Sciences

АВТОРСКОЕ ПРАВО В ОБЛАСТИ ГРАФИЧЕСКОГО ДИЗАЙНА И ВИЗУАЛЬНЫХ КОММУНИКАЦИЙ

Магафирина Айжан Нурлановна
Магистрант. Международная Образовательная Корпорация (Казахская головная архитектурно-строительная академия) (г. Алматы, Казахстан)
Ахмедова Айжан Тимуровна
Доктор архитектуры, Академический профессор, кафедра дизайна. Международная Образовательная Корпорация (Казахская головная архитектурно-строительная академия) (г. Алматы, Казахстан)

Аннотация: Авторское право играет важную роль в сфере дизайна, защищая оригинальные произведения и предоставляя дизайнерам исключительные права на использование и распространение своих творений. Авторское право в сфере дизайна защищает интеллектуальную собственность дизайнеров. Это означает, что они имеют права на свои оригинальные творения и могут контролировать их использование другими лицами.
Авторское право применяется к различным аспектам дизайна, включая графические элементы, визуальные композиции, архитектурные формы и т. д. Оно позволяет авторам защищать свои идеи, предотвращать копирование и несанкционированное использование их работ другими.
Чтобы получить защиту авторского права на дизайн, обычно требуется доказать, что работа является оригинальной и имеет достаточный уровень творчества, чтобы быть признанной как объект авторского права. Различные страны имеют свои законы и процедуры в отношении регистрации и защиты авторских прав, поэтому важно учитывать местные нормы и требования.
Ключесвые слова: графический дизайн, визуальная среда, авторское право, интеллектуальная собственность.

Защита интеллектуальной собственности в сфере дизайна осуществляется через несколько основных механизмов:
Авторское право: Это основной механизм защиты для дизайнеров. Оно применяется к оригинальным работам, созданным в рамках интеллектуальной деятельности, таким как графический дизайн, промышленный дизайн, архитектурные формы и другие. Авторское право предоставляет автору право контролировать использование и распространение своих работ.
Патенты: Для некоторых аспектов дизайна, особенно связанных с техническими решениями или новыми изобретениями, может применяться патентная защита. Например, патенты могут защищать инновационные технические решения в промышленном дизайне, новые материалы или конструкции.
Товарные знаки: В случае дизайна, связанного с брендированием и идентификацией продуктов, важным является защита товарных знаков. Это позволяет дизайнерам защищать

свои логотипы, фирменный стиль и другие элементы, которые идентифицируют их продукты на рынке.

Коммерческие секреты: Некоторые аспекты дизайна могут быть защищены как коммерческие секреты. Например, конфиденциальная информация о процессах производства, материалах или дизайнерских решениях может быть защищена путем сохранения их в тайне и установления соответствующих договорных отношений с третьими лицами.

Договорные отношения: Кроме формальных механизмов защиты, дизайнеры также могут использовать договорные отношения, такие как лицензионные соглашения или договоры о неразглашении информации, для защиты своей интеллектуальной собственности и контроля над использованием своих работ другими сторонами.

Эффективная защита интеллектуальной собственности в сфере дизайна обычно требует комплексного подхода, включающего в себя сочетание различных правовых и договорных механизмов в зависимости от конкретного контекста и целей дизайнера.

Какие права есть у автора на созданную работу:

У автора есть имущественные и неимущественные права. Имущественные права автор может продать или передать. Неимущественные права неотчуждаемы, это значит, что автор даже если захочет — не сможет от них отказаться.

Таблица 1– Неимущественные права автора

1	Право авторства	Автор имеет право признаваться автором произведения, говорить, что именно он создал этот объект.
2	Право на имя	Автор на свое усмотрение может подписывать произведение и его экземпляры своим именем, псевдонимом или не подписывать.
3	Право на обнародование	Автор на свое усмотрение может обнародовать свое произведение или запретить его использовать в открытых источниках.
4	Право на защиту	Никто, кроме автора, без его согласия не имеет право изменять или искажать произведение, использовать в своих целях и совершать с ним любые другие действия, на которые автор не давал согласие.

Эти права навсегда остаются с автором, даже если он продал дизайн, передал заказчику фото или построил готовый объект по дизайн-проекту и этот объект находится дома у заказчика. Вы все равно можете показывать фотографии и говорить, что автор — вы.

Неимущественные права связаны непосредственно с авторством на объект. Даже при передаче прав на проект или иное графическое решение, дизайнер сохраняет право считаться автором. Также неимущественные права позволяют добиться неприкосновенности изображения, проекта или иного объекта – изменить их без согласия дизайнера невозможно.

Если работа дизайнера связана с созданием нового решения внешнего вида продукции, он может получить патент на промышленный образец. Для этого проводится регистрационная процедура, а дизайнер получит патент. Если же изображение или иной графический объект

используются в качестве обозначения коммерческой продукции, можно получить охранное свидетельство на товарный знак.

Таблица 2 – Имущественные права автора

1	Право на воспроизведение	Именно автор решает, где, как и при каких условиях можно показывать и воспроизводить произведение.
2	Право на распространение	Автор может любым способом распространять, передавать или дарить свое произведение.
3	Право на импорт	Автор может создавать копии своего произведения и распространять их любым способом.
4	Право на публичный показ и исполнение	Автор может самостоятельно или с помощью публичных каналов коммуникации, например, через СМИ и соцсети, показывать свои произведения.
5	Право на перевод и другие возможности видоизменения произведений	Никто без согласия автора не может вносить изменения в дизайн, даже фильтр на фото накладывать нельзя, если автор не давал согласия.

Доказательства авторства

В работе дизайнера подтверждением авторства может служить исходный файл и его версии. Он должен содержать слои, кривые, редактируемые блоки вёрстки, используемые элементы и шрифты.

Также доказательством могут служить публикации в СМИ, книгах и каталогах с указанием вашего имени, в интернете. Нарушитель может попытаться найти более ранние публикации с чужим именем, но, если правда на вашей стороне, у него это вряд ли получится. Предыдущие обращения в суд, в которых фигурируют эта работа и ваше имя, также могут подтвердить, что авторство принадлежит вам.

Чтобы зафиксировать дату создания произведения (и доказать таким образом, что именно ваш файл был создан раньше его копий), можно использовать и один из старых способов: отправьте себе письмо с распечаткой работы простой почтой — заклеенный конверт с почтовыми штампами будет доказывать, что вы уже создали произведение на тот момент, когда почтальон поставил печать. Конверт будет вскрыт в суде.

Меры защиты в сфере дизайна

Создав уникальный дизайнерский проект или решение, автор получает защиту от неправомерного использования, копирования и распространения. Если согласие дизайнера отсутствует, либо права не переданы по договору уступки или лицензионному соглашению, незаконное использование признается нарушением закона. Меры защиты от таких противоправных действий предусматривают:

- направление нарушителю требования о запрете на противоправное использование графических и дизайнерских работ, удалении нелегального контента с интернет-ресурсов, изъятие полиграфической продукции из продажи;
- предъявление иска в суд для возмещения убытков или взыскания компенсации – для этого может потребовать оценка нарушенного права или материальных носителей;

- направление требований о приостановке деятельности сайтов с нелегальным контентом, либо обращение в суд для блокировки интернет-страниц;
- подать заявление о принудительной конфискации материальных носителей, выпущенных с нарушением авторских прав.

Авторское право предоставляет дизайнеру следующие исключительные права:

Право на воспроизведение: дизайнер может контролировать, кто и как может копировать его работы.

Право на распространение: дизайнер решает, как его работы будут распространяться (продажа, лицензирование, публикация).

Право на публичный показ: дизайнер контролирует, где и как его работы будут демонстрироваться публично.

Право на переработку: дизайнер может запретить или разрешить другим изменять его работы.

Как защитить авторские права?

Автоматическая защита: авторское право возникает автоматически с момента создания произведения, регистрация не обязательна.

Регистрация авторских прав: регистрация в соответствующих органах (например, в Бюро авторских прав) предоставляет дополнительные преимущества в случае споров.

Маркировка: использование знака охраны авторского права (©) на своих работах.

Договоры: заключение договоров с клиентами и партнерами, где четко прописаны условия использования и передачи авторских прав.

Исключения из авторского права:

Идеи: авторское право защищает форму выражения идеи, а не саму идею.

Общественное достояние: произведения, перешедшие в общественное достояние (истек срок действия авторского права), могут свободно использоваться всеми.

Fair Use (добросовестное использование): в некоторых случаях допускается ограниченное использование произведений без разрешения автора, например, для целей образования, критики или пародии.

Добросовестное использование авторских прав обычно означает, что человек использует чужие авторские произведения в рамках разумного и добросовестного использования, не нарушая права владельца авторских прав. Это важный аспект в контексте авторского права, особенно когда речь идет о цитировании, использовании материалов в образовательных целях, анализе и критике и т. д.

Некоторые основные принципы добросовестного использования включают в себя:

Цель использования: Использование материалов должно иметь определенную цель, такую как комментарий, критика, обучение, научное исследование и т. д.

Характер использования: Использование должно быть ограниченным по объему и характеру, соответствующим цели использования. Например, цитирование небольших отрывков для анализа или обсуждения.

Влияние на рынок: Использование не должно негативно влиять на рынок или потенциальные продажи оригинального произведения.

Натура произведения: Учитывается характер исходного произведения, например, является ли оно фактическим материалом, вымыслом или произведением искусства.

Количество использования: Ограниченное количество использования материалов обычно рассматривается как более добросовестное, чем широкое и полное копирование.

Хотя добросовестное использование не является абсолютным правилом и может зависеть от конкретных обстоятельств каждого случая, следование этим принципам обычно помогает избежать нарушений авторских прав и конфликтов с правообладателями.

Авторское право в Республике Казахстан

Авторское право в Республике Казахстан регулируется законом "Об авторском праве и смежных правах" от 10 июля 1996 года, который внесен в действие с последующими изменениями и дополнениями. Этот закон определяет основные принципы защиты авторских прав и смежных прав, а также правила использования интеллектуальной собственности.

Ниже представлены основные аспекты авторского права в Республике Казахстан:

Объекты авторского права: Закон охватывает разнообразные объекты авторского права, такие как литературные произведения, научные работы, музыку, изобразительное искусство, аудиовизуальные произведения, программы для ЭВМ и базы данных.

Авторские права: Авторские права возникают в момент создания произведения и действуют в течение жизни автора и 50 лет после его смерти (для коллективных произведений - 50 лет с момента публикации, для анонимных и псевдонимных произведений - 50 лет с момента публикации или обнародования).

Исключительные права: Автор имеет исключительные права на использование своего произведения, включая право на воспроизведение, распространение, публичное исполнение, публичное показ, перевод и адаптацию.

Смежные права: Закон также защищает смежные права, которые относятся к интересам исполнителей, производителей фонограмм, производителей видеофильмов, радио- и телепередач и организаций сбора и распределения вознаграждений.

Лицензирование и передача прав: Авторские права могут быть переданы или лицензированы третьим лицам на основе договоров.

Охрана прав: В случае нарушения авторских прав, автор или правообладатель имеет право на защиту своих прав в судебном порядке.

Кроме того, в Казахстане существуют механизмы для защиты прав интеллектуальной собственности через регистрацию торговых марок, патентов и других интеллектуальных результатов. Эти меры помогают предотвращать нарушения и обеспечивать правовую защиту правообладателям.

Субъекты авторского права:

Авторы: физические лица, творческим трудом которых создано произведение.

Правопреемники: лица, которым перешли авторские права по наследству или договору.

Содержание авторского права:

Личные неимущественные права: право авторства, право на имя, право на неприкосновенность произведения, право на обнародование.

Имущественные права: право на воспроизведение, распространение, публичный показ, импорт, перевод, переработку и другие способы использования произведения.

Регистрация авторских прав:

Регистрация авторских прав в Казахстане не является обязательной, но предоставляет автору дополнительные преимущества в случае споров.

Регистрация осуществляется в Национальном институте интеллектуальной собственности (НИИС).

Защита авторских прав:

Гражданско-правовая защита: возмещение убытков, взыскание компенсации, изъятие контрафактных экземпляров.

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Pharmaceutical Sciences

PHARMACEUTICAL CARE IN TREATMENT OF DERMATITIS

TAMAZ TCHUMBURIDZE
Professor. TSMU. Department of Social and Clinical Pharmacy. Tbilisi, Georgia.
MAYA MATHOSHVILI
Associate Professor. TSMU, Department of Skin and Venous Diseases, Tbilisi, Georgia.
NINO NEMSITSVERIDZE
As. Professor. TSMU. Department of Social and Clinical Pharmacy. Tbilisi, Georgia.
SALOME BERIDZE
Master of Pharmacy. Tbilisi, Georgia.
LIZI TOMADZE
4th year student of the Faculty of Pharmacy at Tbilisi State Medical University, Head of the Faculty of Pharmacy in the Student Self-Government of Tbilisi State Medical University and President of Georgian Pharmaceutical Students' Association. Tbilisi, Georgia.
IOSEB TOMADZE
Master of Pharmacy. TSMU. Department of Social and Clinical Pharmacy. Tbilisi, Georgia.

Dermatitis is widespread throughout the world. Approximately 20% of children and 3% of adults have dermatitis of various genesis. Despite the fact that the health care system works all over the world and the treatment methods are improving day by day.
The severity and frequency of allergic diseases and dermatitis are increasing, caused by contributing factors such as drinking water, soil and air pollution; use of chemicals and industrialization; detergents and cosmetics; some food products; Availability of medicines and their uncontrolled use. Due to these problems, the referral of patients with dermatitis to the pharmacy has increased dramatically. The purpose of the research paper was to find out how important the role of the pharmacist is in the management of dermatitis. For which we interviewed pharmacists working in the pharmacy and their patients.
Quantitative research methods were used within the study. A total of 25 pharmacists and 50 patients were interviewed. As a result of a survey, we found that 64% of pharmacists are often approached by people with dermatitis with a request for drug selection. In today's reality, for the sake of saving expenses and due to other problems, the population often bypasses the doctor and turns to the pharmacy, at such times the pharmacist is an important link in the prompt implementation of care for the patient. As we learned from the survey, 96% of patients with dermatitis have a doctor's prescription. But still, there remain patients who do not have a prescription and try to cope with the problem by themselves, they definitely need the advice of a pharmacist. About 76% of the surveyed pharmacists prefer to choose only external remedies for the patient, and 24% prefer their combination with oral medications. Means for external use are prescribed much more often than internal ones, it is worth noting that in the treatment of rashes combination of externally applicable medication and oral medication is much more effective, however, it is better to consult a dermatologist in acute cases, as it is necessary to accurately

determine the cause and symptoms of the rash. About 75% of the respondent pharmacists think that their involvement in the management of dermatitis during self-medication will significantly improve the condition of patients. As for the patient survey on the question of how often they turn to a pharmacist before visiting a doctor, 78% of respondents first turn to a pharmacist as the first step of seeking help, for them the immediate effect is important, which may be delayed if they plan a visit to the doctor. However, there is a category of patients, 22%, who rarely or never turn to the pharmacist for help, explaining this by distrusting the pharmacist. During self-medication, in case of allergic reactions on the skin patients often uses a combination of external and internal means. Erius, Alertek, Suprastin are most often used by patients, with Elocom, Triderm, Levomecol ointments used as external remedies. In the event that a patient who comes to the pharmacy complains about rash, itching and redness, or irritation on the skin, there is a suspicion of a skin disease, for an accurate diagnosis it is necessary to visit a doctor, especially if these symptoms have been going on for a long time. Through talking with the patient, we should be able to perceive the symptoms correctly and see if we can help him within our competence. We need to determine if whatever the patient says is indeed allergic contact dermatitis, because the symptoms mentioned by the patient may also be characteristic of other diseases. We have to determine how often these symptoms manifest, or whether he started having a rash on his skin after eating something, or maybe as a result of contact with some chemicals.
In case of a positive answer, a specific disease should be treated by a doctor. In conclusion, it can be said that the increase in the number of cases of dermatitis has led to an increase in visits with both dermatologists and pharmacists. In this process, the pharmacist's role increases dramatically, in order to avoid the unfortunate consequences of drug side effects and self-medication. Based on the analysis of the research data, we have developed a conversation algorithm between a pharmacist and a patient with dermatitis, which will allow the pharmacist to accurately assess the patient's condition in a question-and-answer mode, helping him to select the necessary medication for the patient, and explain the manner and frequency of its use. The questionnaire will also allow to rule out dangerous symptoms, during which it is necessary to send the patient to a doctor immediately.

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SUMMARY

Dermatitis is widespread throughout the world. Dermatitis patients with these problems often resort to self-medication and bypass the doctor and go to Afiak first. The aim of the study was to find out how important the pharmacist's role is in the management of dermatitis. For which we interviewed the pharmacists working in the pharmacy and dermatitis patients with A total of 25 pharmacists and 50 patients were interviewed. Based on the analysis of the data, we have developed a conversation algorithm between a pharmacist and a patient with dermatitis, which will allow the pharmacist to answer questions to accurately assess the patient's condition, to select the necessary medication for the patient, to explain the manner and frequency of its use. By means of questions, to rule out dangerous symptoms, during which it is necessary to send the patient to a doctor immediately.

Medical Sciences

Reactivity of brain blood flow in patients with Tension-type Headache

Kalashnikov Valeriy Yosypovych

MD, PhD, Associate Professor of the Department of Ultrasound and Functional Diagnostics of the Scientific and Educational Institute of Postgraduate Education. Kharkiv National Medical University

Stoyanov Oleksandr Mykolaiovych

MD,PhD,D.Sci., Professor at the Department of Neurology and Neurosurgery. Odesa National Medical University

Tension-type headache is very common, with a lifetime prevalence in the general population ranging in different studies between 30% and 78%. The percentage of the adult population with an active headache disorder is 47% for headache in general, 10% for migraine, 38% for tension-type headache, and 3% for chronic headache that lasts for more than 15 days per month. Primary tension-type headaches occur in approximately 40% of the adult population worldwide. Central sensitization caused by prolonged nociceptive input from muscles is considered to play an important role for chronification of tension-type headache.

Directly and indirectly chronic tension-type headache (CTTH) causes high costs and considerable loss of quality of life. The pain rating of the electrical stimuli and the pain score of the hypertonic saline infusion were significantly higher in CTTH patients than in healthy volunteers. The primary endpoint was the relative change of the blink reflex integral immediately after hypertonic saline infusion. It was significantly smaller in CTTH patients on the contralateral side compared to healthy volunteers, while there was no significant difference on the ipsilateral side.

Neck pain is highly prevalent in the general population and even more prevalent in individuals with primary headaches. Prevalence is highest in coexistent M+TTH, followed by pure TTH and migraine. Myofascial tenderness is significantly increased in individuals with neck pain. Tension-type headache has a high socio-economic impact. Divided into episodic and chronic types, introduced in the manual "International Classification of Headache Disorders"(ICHD-III), it has practical importance. Infrequent episodic headaches (no more than once a month) may not require drug therapy, but, on the contrary, frequent forms may require expensive treatment. Chronic tension-type headache is a serious disease, causing greatly decreased quality of life and high disability.

Materials and Methods: A retrospective analysis of the results of ultrasound dopplerography of the anterior, middle and posterior cerebral arteries (ACA, MCA and PCA), Vertebral and Basal (VA, BA) arteries was performed in 188 patients with Tension-type Headache. Among them are infrequent episodic (IFE) TTH - 68 (36,2%) patients, frequent episodic (FE) TTH - 64 (34,0%) patients, chronic (Ch) TTH - 56 (29,8%) patients. The age of the subjects was 18-45 years, among them 85 (45.2%) men and 103 (54.8%) women.

The state of cerebrovascular reactivity was assessed using the following functional tests:

1) hypercapnic test, reactivity coefficient (Rc CO2);
2) hyperventilation test, reactivity coefficient (Rc O2);
3) orthostatic test, reactivity coefficient (Rc Ot);

4) antiorthostatic test, reactivity coefficient (Rc AOt);
5) functional nitroglycerin test, reactivity coefficient (Rc FNt),
6) functional metabolic test, reactivity coefficient (Rc FMt)
The control group (CG) - 50 clinically healthy volunteers of both sexes of appropriate age. The maximum systolic velocity (Vs), the end diastolic velocity (Vd), the resistance and pulsativity indexes (RI, PI) in all vessels were determined.
Statistical analysis and material processing was performed using the Statistic 6.0 software package. Differences recognized statistically significant at P <0.05.
Results: Among the surveyed, infrequent episodic (IFE) TTH were recorded in 86.4% of cases, frequent episodic (FE) — in 88.9%, and chronic (Ch) TTH — in 81.6% of cases. Bilateral TTH was noted in 39.2%, frontal localization - in 35.6%, in the occipital region - in 25–7% of cases. As a provoking factor for TTH, emotional stresses occurred in 38.4%, wearing tight headgear - in 22.1%, combing - in 13.2% of cases, respectively. Nausea was observed in 11.4% of cases, phonophobia - in 8.3%, vomiting - in 4.4%, photophobia - in 4.1%, vegetative dysfunction in 74.7%, emotional lability - in 67.8%, extended tendon hyperreflexia without focal neurological symptoms in 48.7% of cases, respectively.
The asymmetry of the maximum systolic blood flow velocity (Vs) in the paired arteries within 20-30% was considered a violation of cerebral hemodynamics, which was detected in 38.7% of patients. An increase in Vs was noted in all cerebral vessels, especially in patients with FE TTH and chronic Ch TTH compared with the control group.
RcFMt parameters were significantly increased in all clinical groups. In patients with IFE TTH the average value of this coefficient was 1.24±0.03 ($p<0.05$), in patients with FE TTH - 1.25±0.02 ($p<0.05$), in patients with Ch TTH - 1.27±0.03 ($p<0.05$).
In patients with TTH, hyper-responsiveness to hypercapnic test was detected: RcCO2 was 1.43±0.05 ($p<0.05$) in the group with FE TTH; 1.39±0.07 in the group of Ch TTH and 1.37±0.04 in the group of IFE TTH, which indicates a tendency for the tension of the vasodilator regulation mechanism even in clinically insignificant forms of TTH. In the study of reactivity to the O2-test, a hyporeactive response was observed in the groups with FE TTH and Ch TTH (0.38±0.04 and 0.35±0.05; $p<0.05$).

The results of the orthostatic test did not reveal significant differences in patients with IFE TTH, FE TTH and Ch TTH (0.14 ± 0.03; 0.18 ± 0.03 and 0.19 ± 0.03). In the study of reactivity to the nitroglycerin and the antiorthostatic tests, there were no significant differences between the parameters of patients with TTH and CG.

Conclusion:
In patients with TTH, an increase in the maximum systolic velocity is more often recorded, their asymmetry in the vessels of the Circle of Willis and the vertebral arteries.
Hyperreactivity on CO2-test is typical for patients with both episodic and chronic TTH, and reflects the mobilization of metabolic regulation of cerebral blood flow.
Conducting functional metabolic test (FMT), which models the response of cerebral mechanisms of reactivity to mechanical stress, was the most informative method for detecting autoregulatory disorders mainly in patients with infrequent episodic TTH.
Frequent episodic TTH in patients is characterized by the presence of a hyperactive reaction to hypercapnic and orthostatic tests, probably due to mobilization of humoral-metabolic and neurogenic links of regulation.
In the group of patients with chronic TTH prevails hyporeactivity for hyperventilation test, reflecting the depletion of vasoconstriction reserve.

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ТҮРКІСТАН ҚАЛАСЫНДА ЭКОЛОГИЯЛЫҚ ҚОЛАЙСЫЗ АЙМАҚТА ТҰРАТЫН ТҰРҒЫНДАР АРАСЫНДА ПСОРИАЗДЫҢ ЖИІЛІГІ МЕН ТАРАЛУЫ

Алдабергенова Шырай Адилханкызы
Ғылыми жетекші аға оқытушы, «Жалпы хирургия» кафедрасы, Қожа Ахмет Ясауи атындағы Халықаралық қазақ-түрік университеті, Түркістан қаласы, Қазақстан
Бахытбек Жанель Өскенқызы
«Медицина» мамандығының 1-ші курс студенті, Қожа Ахмет Ясауи атындағы Халықаралық қазақ-түрік университеті, Түркістан қаласы, Қазақстан

Аңдатпа: Осы мақалада Оңтүстік Қазақстан облысының экологиялыққолайсыз аймағында тұратын тұрғындар арасында псориаздың жиілігімен таралуы, 2021-2023 жылдарға арналған Түркістан қаласының «Тері-венерологиялық диспансер» дерматовенерологиялық қызметініңконъюнктуралық зерттеу материалдары бойынша қарастырылған.Мұндай дерматологиялық мәселенің псориаз ауруына шалдығуы шүбәсіз. Аурудың даму себептерінің басым рөлі генетикалық бейімділікке беріледі. Дегенмен, бүгінгі күні ғалымдар процестің қандай факторларының белсендірілуіне аса назар аударады және иммундық өзгерістердің рөлі қандай екендігін зерттейді.
Кілт сөздері: *псориаз, статистикалық ақпарат, аурушаңдық, таралуы, экологиялық қолайсыз аймақ.*

Псориаз - бұл созылмалы қабыну ауруларының ең көп таралғандарының бірі, оның патогенезінде иммундық бұзылулар маңызды рөл атқарады.Бұл тері ауруларының ең ауыр түрі болып қарастырылады. Олардың таралуы тез. Барлық терінің, тері астындағы тіндердің ауруларының 3%-ын құрайды және шамамен диабет ауруының жиілігімен бірдей кездеседі [1]. Псориаз ауруы сирек өлімге әкеледі және адамның өмір сапасына айтарлықтай әсер етеді. Әлемдегі псориаздың таралуы орташа есеппен 3% құрайды. Науқастардың көбеюі тұрғылықты аймаққа байланысты өзгереді. Псориаз дамуының факторлары: дұрыс емес өмір салты, стресс, темекі шегу, спиртті ішімдік қолдану, қимыл қозғалысы шектелген өмір салтын ұстану. Бұл мәселелер Қазақстан Республикасының тұрғындары үшін де маңызды болып табылады. Басқа елдердегідей біздің елімізде де аурушаңдық жоғары екендігін болжауға болады. Зерттеуге қарағанда псориазбен ауыратын науқастардың 25%-да қалыпты өмір салтының белсенділігі төмен екендігі көрінеді [2]. Аурудың 40%-да киімді таңдап киюіне тура келеді, алал 36%-да ұйқысының бұзылулары көрінеді [3].

Псориаздың таралуы этникалық тегіге байланысты кеңінен өзгереді. Псориаз көбінесе кавказдықтарда кездеседі, болжам бойынша бұл популяцияда 60 100,000/жылына 2 жағдай кездеседі. Америка Құрама Штаттарында оның таралуы 4-0.3 пайызды құрайды, дегенмен жергілікті американдықтар мен кейбір афроамерикалық популяцияларда сирек кездеседі немесе жоқ. Жапонияда жиі кездесетінімен, Қытайда бұл әлдеқайда аз, болжамды аурушаңдық 1.5 пайызды құрайды. Солтүстік Еуропа мен Скандинавияның жалпы тұрғындарының арасында таралу 3-1 пайызды құрайды. Әйелдер мен ерлер бұл жағдайға

бірдей әсер етеді. Кеңдіктің таралуына әсер ететінін байқау, ең алдымен, күн сәулесінің ауруға пайдалы әсер етуімен байланысты.33 Псориаз кез келген жаста пайда болуы мүмкін болса да, созылмалы бляшка псориазының орташа басталу жасы 75 жаста бағаланады, істердің 46.2 пайызы басталған. 3 жасқа дейін әйелдерде ерлерге қарағанда ертерек пайда болады. Бойлық зерттеулер псориазбен ауыратын науқастардың шамамен үштен бірінде өздігінен ремиссия болуы мүмкін деп болжайды.

Климаттық жағдайлар және метерологиялық құбылыстар, мысалы: температура, ылғалдылық, атмосфералық ақаулық, күннің аптап ыстығы, ғарыштық радиациялардың тәуліктік және мезгілдік динамикалары, псориаз клиникасына және ағымына елеулі әсерін тигізеді. Метерологиялық факторлардың арасында жоғары температура мен ылғалдылық псориаздың маусымдығына және таралуының жиілігіне әсер етеді. Олардың әсерінен организмнің жалпы қорғаныс-бейімделу мүмкіндіктері азайып, иммунды реактивтілік бұзылады, бұл одан әрі ауруларды хронизациялауға және генереализациялауға алып келеді [4].

Экологиялық дағдарыс шын мәнінде қауіп төндіріп отыр: іс жүзінде тез өріс алып бара жатқан дағдарыстық жағдайларды кез келген аймақтардан көруге болады. Табиғи қорлар мен ортаны қорғау, қазіргі әлемде экологиялық проблемалар өзінің қоғамдық мәні жағынан алдыңғы қатардағы мәселелердің біріне айналды. Адамның шаруашылық іс-әрекетінің қауырт дамуы, айналадағы ортаға үдемелі, көбіне бүлдірушілік сипатта әсер етуде. Адамның табиғатқа әсері мыңдаған жылдар бойында қалыптасқан табиғи жүйелерді өзгерту, сондай-ақ, топырақты, су көздерін, ауаны ластау арқылы жүзеге асуда. Бұл табиғат ахуалының күрт төмендеуіне әкеліп соғуда, көп жағдайларда орны толмас зардаптар қалдыруда. Табиғаттық катаклизімдер апаттарына қарағанда антропогендік фактор қоршаған ортаға үлкен қауіп төндіруде. Қазақстанда ауыр металлургиялық өндірістер, сынақ полигондары, ракета ұшыру алаңдары, т.б. өндіріс ошақтары орын алуда. Өндірістерден шыққан қалдықтар су қоймаларына ағызу арқылы, егістік жерлер мен жайылымдар, шабындық жерлерді құрамында уландырғыш металдары бар пестициттермен уландырды. Соның салдарынан өзен – көлдердің шөгінділері, құнарлы жерлер, атмосфералық ауа ауыр металл тозаңдарымен ластанып, экожүйенің тепе – теңдігі бұзылып отыр [2,3].

Оңтүстік Қазақстан облысы Қазақстанның экологиясы қолайсыз алты аймағының бірі болып табылады және «Биологиялық әртүрлілікті сақтау және теңгерімді пайдалану туралы ұлттық есебін» айқындау бойынша Қазақстанның экологиялық аймақтарының екінші тобына кіреді. Экологиялық жағдайға байланысты облыстың аумағы шартты түрде үш аймаққа бөлінеді: экологиялық дағдарыс аймағы: Түркістан, Отырар, Арыс, Шардара, Созақ қалалары; Экологиялық қауіпті аймағы: Шымкент, Кентау; Экологиялық қалыпты аймағы: Сарыағаш қаласы, Ленгір, Жетісай, Арал дағдарысының Түркістан аймағына әсер ету проблемалары, оның климатының өзгеруі, СЫРДАРЬЯдағы судың құрамының төмендеуі және оның улы химиялық заттармен ластануы және адам денсаулығына қоршаған ортаға әсері үнемі өзекті мәселе болып табылады.

«Арал маңындағы экологиялық апатқа ұшыраған азаматтарды әлеуметтік қорғау туралы» Қазақстан Республикасының 1992 жылғы 30 маусымдағы Заңының 13-бабының 1-тармағына сәйкес экологиялық апат аймағында тұратын халыққа төлемақы қоршаған ортаға қолайсыз жағдайларда өмір сүру коэффициенті негізінде белгіленеді. Заңның 5-бабының 2-тармағына сәйкес Оңтүстік Қазақстан облысының Түркістан қаласы экологиялық дағдарысқа дейінгі мемлекеттің аймағына кіреді.

Арал проблемасы, жер шарымыздың ірі экологиялық апат ретінде өткір сипаттамаға ие болды. «Арал теңізі аймағындағы тұрғындардың жағдайларын түбегейлі түрлендіру үшін шұғыл шаралар туралы», Қазақстан Республикасы Жоғарғы Кеңесінің 1992 жылғы 18 қаңтардағы қаулысы негізінде, Қазақстан жеріндегі Арал өңірінің бөлігі

экологиялық апатты аймақ деп жарияланған. 2 «Арал маңының экологиялық апат салдарынан зардап шеккен азаматтарды әлеуметтік қорғау туралы» Қазақстан Республикасының 1992 жылғы 30 шілдедегі заңы 2 бабына сәйкес, Арал өңірінің экологиялық апатты аумақтары төмендегідей аймақтарға бөлінеді: экологиялық апатты, экологиялық дағдарысты, экологиялық дағдарыс алды жағдайы [1-3].

Қызылорда облысының Арал және Қазалы аудандары, Ақтөбе облысының Шалқар ауданы экологиялық апатты аймақтарға жатады (Заңның 3 бабы). Қызылорда облысының (Арал және Қазалыдан басқа) Қызылорда қаласы және Ленинск қаласы экологиялық дағдарысты аймақтарға жатады. Ақтөбе облысының Байғанин, Ырғыз, Мұғалжар (бұрынғы Мұғаджар ауданының елді мекен шекарасы шеңберінде) Темір аудандары; Оңтүстік Қазақстан облысының Түркістан қаласы және Шардары, Арыс (оның ішінде Арыс қаласы) Отырар, Созақ аудандары, сондай-ақ Қарағанды облысының Ұлытау ауданы (Жезқазған облысының бұрыңғы Жезді ауданының елді мекен шекарасы шеңберінде) дағдарыс алды аймақтарға жатады [4]. Дегенмен, осы өңірлердегі барлық тұрғындардың топтары арасындағы халықтың денсаулық жағдайына аралық зерттеу жұмыстары жүргізілмеген. Өңір- ISSN 1727-9712 Гигиена труда и медицинская экология. №3 (52), 2016 47 лердегі елді мекен тұрғындарының денсаулық жағдайына зерттеу жұмыстары жекелеген сипатта, тұрғындардың жеке дене мүшесі және жүйесінің сырқаттануымен байланысты, бұл жекелеген елді мекен тұрғындарының мекендеу ортасының жеке қолайсыз факторларымен байланысты болып келеді [4]. Осыған орай, Арал маңы халқының денсаулығына кешенді зерттеулер жүргізу мақсатында, Қазақстан Республикасының Денсаулық сақтау Министрлігімен «Арал маңы халқының денсаулығын басқарудың кешенді тәсілдері» атты 2014 жылдан бастап 2016 жылға дейінгі мерзім аралығында орындалатын ғылыми-техникалық бағдарлама әзірленді.

Қазіргі даму кезеңіндегі адам экологиясының пайда болу өзектілігі, адам тіршілігі үшін экологиялық қолайлы және қолайсыз аудандар. Қоршаған орта жағдайының негізгі экологиялық индикаторы – халық денсаулығы екендігі белгілі, ал табиғи ортаның саулық деңгейі – әлеуметтік, экологиялық, демографиялық кешенді күрделі факторлар әсерімен айқындалады. Қоршаған ортаның бүкіл табиғи байланысы сол сияқты адам әрекетінің басымдылығы мен соның ішінде ғылымитехниканың қоғам өміріне жедел енуімен XX ғасырдың орта шенінен бастап, экология терминіне жаңаша ғылыми көзқарас қалыптастырды. Экология ғылымының жаңа құрылымы қалыптасты. Бүгін күрт өзгерген экологиялық мәселелерді шешуде адамның өзі жасап отырған күрделі ғылыми жетістіктерін ендігі жерде табиғи ортаны, адам баласының болашағын сақтау, табиғатты қорғау және тиімді пайдалану үшін қажет. Адам экологиясы мәселесі кең мағынасында келесі тізбекті жағдайларға байланысты: адамның техногенді әрекеті, ол тек жаңа техника ойлап табу ғана емес, технология, өндірістік орындар, жаңа заттар және композициялардың ашылуымен қатар, қоршаған және өндірістік ортаның (ауа, су қоймалары, топырақ, өндіріс аймағы) зиянды химиялық заттарымен, ароматты көмірсутектермен, ауыр металдармен уланuы, яғни өндірістік орта мен тіршілік ету ортасының антропогенді ластануы [1,2,4].

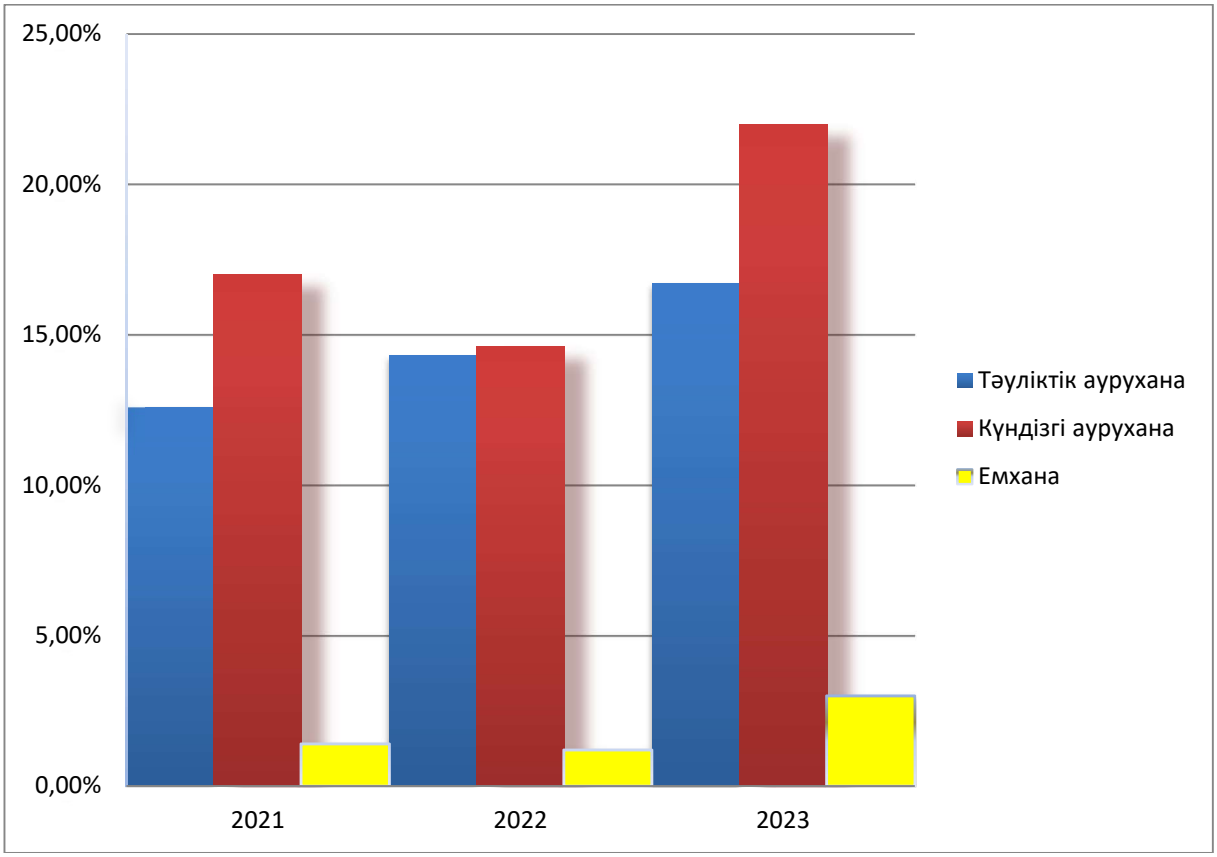
Зерттеу мақсаты: Қазақстан Республикасының экологиялық қолайсыз аймақтарында тұратын тұрғындар арасында псориаздың жиілігі мен таралуын бағалау және зерттеу.

Әдістеме. 2021-2023 ж.ж. Түркістан қаласындағы «Тері-венерологиялық диспансер» дерматовенерологиялық қызметінің конъюнктуралық зерттеуі бойынша жыл сайынғы статистикалықесептіліктің негізінде Қазақстан Республикасында аурудың даму тенденцияларын талдау жүргізілді. Атап айтқанда, псориаз ауруының аймақтық ерекшеліктері, өсу қарқыны зерттелді.

Нәтижелер мен талқылаулар. Біздің зерттеуіміздіңбасында Түркістан қаласындағы «Тері-венерологиялық диспансердің» дерматовенерологиялық қызметінконъюнктуралық зерттеу негізінде 2021-2023 жылдарға арналған псориаз ауруын талдау.

1-Кесте. Түркістан қаласындағы «Тері-венерологиялық диспансеріндегі» дерматовенерологиялық қызметін конъюктуралық зерттеу деректері бойынша псориаз жиілігі

Көрсеткіш (%)	2021ж.	2022ж.	2023ж.
Тәуліктікаурухана	12.6%	14.3%	16.7%
Күндізгіаурухана	17%	14.6%	22%
Емхана	1.4%	1.2%	3%



Нәтижелер

Түркістан қаласындағы «Тері-венерологиялық диспансері» дерматовенерологиялық қызметінің 2021-2023 жылдарға арналған статистикалық деректерін талдау нәтижесінде төмендегілер атап өтілді:

1. Псориазбен жалпы сырқаттанушылық жиілігі экологиялық қолайсыз аймақта ОҚО Түркістан қаласында 4,9% - ды құрайды.

2. Жыл сайын 24 сағаттық ауруханаңың пациенттері арасында псориаз ауруының жиілігі 12,6%, 14,3% -дан 16,7% -ға дейін артуда.

Қорытынды: Адамзаттың XXI ғасырдағы экологиялық дағдарыспен және табиғатты тиімсіз пайдалану салдарына байланысты Қазақстанның проблемалық жағдайлары көбеюде. Экологиялық проблемаларды ғаламдастырудың себептерін қарастыру кезінде адамның қоршаған ортаға: саяси – мемлекеттік және экологиялық факторларды ескеру қажет. Экологиялық фактордың әлеуметтік тобында мынадай түрлерге жіктеледі: әлеуметтік – экономикалық және рухани өнегелі. Қазіргі таңда қоршаған ортаның жеке факторлардың әсері адамның денсаулық жағдайындағы өзгерістерді бөлшектеп анықтау қиын. Бірқатар жарияланымдарда жұқпалы емес аурушаңдықтың кейбір өмір үшін маңызды элементтерінің табиғи асқындық немесе зәрулік байланысы анықталған. Сонымен бірге, халықтың денсаулық жағдайының деңгейін қалыптастыруда адамның тіршілік ету ортасы факторлары кешені әсерінің маңызы зор екені күмәнсыз. Соңғы жылдары қоршаған ортаны қорғау проблемасы ғаламдық сипатқа ие болуда, өйткені табиғат пен оның ластануында әкімшілік шекара жоқ. Сондықтан дамыған елдердің үкіметтерінің қоршаған ортаны қорғау мәселелеріне аса көңіл аударуы кездейсоқ емес және осы зиянды әсердің алдын алу үшін көп қаражат бөледі.

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БАЛАЛАРДАҒЫ УРАХУС АНОМАЛИЯЛАРЫН ДИАГНОСТИКАЛАУ ЖӘНЕ ХИРУРГИЯЛЫҚ ЕМІ

Турсынбаева Гулжазира Асилханқызы
Ғылыми жетекші аға оқытушы, «Жалпы хирургия» кафедрасы, Қожа Ахмет Ясауи атындағы Халықаралық қазақ-түрік университеті, Түркістан қаласы, Қазақстан
Рүстембек Асылай Жайшыбекқызы
«Жалпы медицина» мамандығының 4-ші курс студенті, Қожа Ахмет Ясауи атындағы Халықаралық қазақ-түрік университеті, Түркістан қаласы, Қазақстан

Аңдатпа: *Урахус патологиялары Көбінесе Жаңа туған нәрестелерде диагноз қойылады және пайда болу жиілігі өте жоғары (кейбір мәліметтерге сәйкес, бірақ туылғандардың 30-50% - до урахус патологиясы бар). Лапароскопиялық технологиялардың қарқынды дамуына және урахус патологиясының пайда болуының жоғары деңгейіне қарамастан, қазіргі әдеби дереккөздерде осы тақырып бойынша материалдар өте аз, бұл біздің шолуымыздың сұранысы мен уақтылығына байланысты. Урахустың даму ақаулары әсер етпеу дәрежесіне байланысты 4 түрге бөлінеді: кіндік фистуласы; урахус кистасы; везико-кіндік фистуласы; қуық дивертикуласы. Урахустың даму ақауларына арналған консервативті терапия кіндік фистуласы (синус) болған жағдайда ғана мүмкін болады. Барлық басқа жағдайларда, сондай-ақ консервативті терапия тиімсіз болған жағдайда хирургиялық емдеу жүргізіледі.*
Тірек сөздер*: урахус кистасы, кіндік фистуласы, кіндік синусы, кіндік фистуласы, қуық дивертикуласы, лапароскопия, урахус кисталарын лапароскопиялық емдеу, урахус ақаулары, балалар хирургиясы, клиникалық тәжірибе, аз инвазивті операциялар.*

Аннотация: *Патологии урахуса чаще всего диагностируются у новорожденных и имеют очень высокую частоту возникновения (по некоторым данным, но 30-50% рождений имеют патологию урахуса). Несмотря на стремительное развитие лапароскопических технологий и высокий уровень возникновения патологии урахуса, в современных литературных источниках очень мало материалов по этой теме, что обусловлено востребованностью и своевременностью нашего обзора. Пороки развития урахуса делятся на 4 типа в зависимости от степени поражения: пупочный свищ; киста урахуса; везико-пупочный свищ; дивертикул мочевого пузыря. Консервативная терапия пороков развития урахуса возможна только при наличии пупочного свища (пазухи). Во всех остальных случаях, а также при неэффективности консервативной терапии проводится хирургическое лечение.*
Ключевые слова*: киста урахуса, пупочный свищ, пупочный синус, пупочный свищ, дивертикул мочевого пузыря, лапароскопия, лапароскопическое лечение кист урахуса, пороки развития урахуса, детская хирургия, клиническая практика, малоинвазивные операции.*

Урахус (зәр шығару жолы) – қуық пен кіндікті байланыстыратын және зәрді амниотикалық сұйықтыққа ағызуға қызмет ететін эмбриональды түтікшелі масса. Антенатальды кезеңнің 4-5 айында урахус облитерацияға ұшырайды. Бұл түтіктің

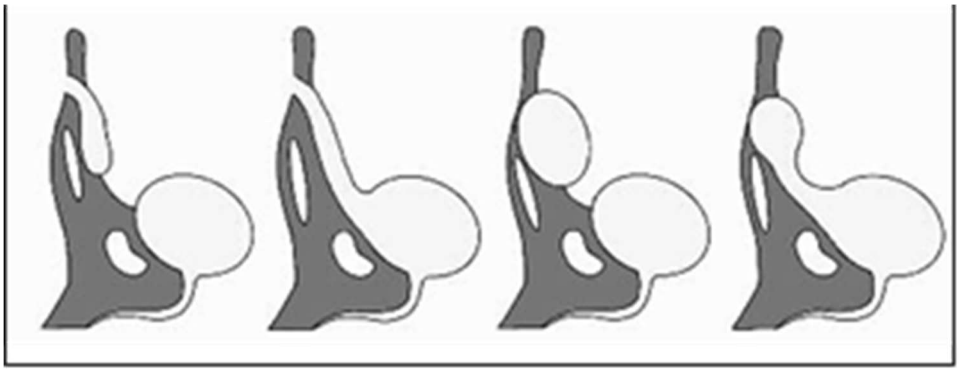
ауытқулары оның облитерация процесінің бұзылуына байланысты [1]. Зәр шығару жолдарының туа біткен ауытқулары өте сирек кездеседі. Олар әдетте балалық шақта кездеседі, бірақ ересек жасқа дейін асимптоматикалық болып қалуы мүмкін. Бұл патология инфекциялық-қабыну процесі пайда болған кезде анықталады [2]. Клиникалық көріністердің жасы, әсіресе урахус кисталары, 3-тен 6 жасқа дейін [3, 4]. Ультрадыбыстық зерттеу кезінде кіндік аймағындағы нәтиже кіші диаметрлі құрылым болуы мүмкін, кіндіктің ортаңғы сызығынан төмен орналасқан кисталық қосындыға ұқсайды. Кистаның іріңдеуімен соңғысы қалың қабырғалы болады, мазмұны гетерогенді құрылымға ие болады [5]. Емдеудің тактикасы мен тәсілдері консервативті болуы мүмкін және авторлар түтік элементтерінің регрессия ықтималдығын, сондай-ақ асқынулардың даму қаупін көрсетеді [6, 7]. Басқалары әртүрлі іріңді асқынулардың даму қаупінің жоғары болуына байланысты белсенді хирургиялық тактиканы қолдайды [8, 9].

Жіктелуі.

Урахустың ақаулары құрыспау дәрежесіне байланысты 4 түрге бөлінеді: ***кіндік фистуласы; урахус кистасы; кіндік фистуласы; қуық дивертикуласы (сурет. 1).***

Көбінесе эмбриональды зәр шығару жолының сыртқы және ішкі бөліктері өскеннен кейін пайда болған урахустың немесе оның кистасының қалған литериалды емес кіндік бөлігі - бұл "кіндік фистуласы" және "урахус кистасы". Клиникалық түрде кіндік фистуласымен оның айналасындағы тері макерацияланған, қабынған, түйіршіктер бар, серозды бөліну. Зондпен зерттеген кезде қуық бағытында ортаңғы сызық бойымен соқыр аяқталатын қалта анықталады. Көбінесе кіндік фистуласы жұқтырылуы мүмкін, бұл жағдайда іріңді бөліну қосылады.

Урахус кистасы қабыну сәтіне дейін клиникалық түрде көрінбеуі мүмкін және ультрадыбыстық зерттеу немесе іш қуысы мүшелеріне хирургиялық араласу кезінде ғана диагноз қойылады. Локализацияға байланысты урахустың периопулярлы, аралық және кіндік кисталары ажыратылады. Урахус кистасы тар фистуламен байланысуы мүмкін - кіндігі, қуығы бар үй немесе екеуімен бір мезгілде, бұл жағдайда инфекция кезінде іріңдеу белгілері қосылады – ауырсыну, ісік түзілуінің үстінде терінің гиперемиясы, безгегі, клиникалық қан анализіндегі қабыну өзгерістері пайда болады. урахустың даму ақауларының төрт түрі шешілмеу дәрежесіне байланысты



Сурет.1.урахустың даму ақауларының төрт түрі шешілмеу дәрежесіне байланысты

Ең жиі *кездесетіні везико кіндік фистуласы*. Клиникалық түрде кіндіктен зәр шығару байқалады (тамшылармен, ал баланың мазасыздығымен және іштің алдыңғы қабырғасының кернеуімен – ағынмен). Толық фистула жағдайында оған бояғыш заттарды (мысалы, метилен көк немесе индигокармин) енгізу диагнозға көмектеседі. Зәрді бояу фистуланың пузыреммен байланысын көрсетеді. Фистуланы диагностикалау кезінде рентгендік фистулография және цистография да жасалады.

Әдістер. урахуса. Талдау жынысын, жасын, клиникалық көріністерін, қосымша зерттеулерді, түтіктің бітелмеу түрін және емдеу нұсқаларын ескере отырып жүргізілді. Қабылдау кезінде анамнез жиналды, Жалпы клиникалық тексеру жүргізілді, кіндіктен бөліністер болған кезде фистула жолын тексеру және микрофлораға себу жүргізілді. Зертханалық зерттеулерге мыналар кірді: жалпы қан мен зәр анализі, биохимиялық қан анализі (С-реактивті ақуыз). Зерттеудің қосымша әдістерінің ішінен мыналар қолданылды: сызықтық датчикті қолдана отырып, көлденең және бойлық сканерлеуде ультрадыбыстық зерттеу және кіндік аймағын егжей-тегжейлі бағалау және қуыққа төмен қарай, көрсеткіштер бойынша фистулография, цистография. Аномалияның диагностикалық нұсқасы негізінде консервативті және / немесе хирургиялық емдеу қолданылды. Консервативті емдеу урахустың толық емес фистулаларында қолданылды және сутегі асқын тотығымен, фурацилинмен немесе хлоргексидинмен, калий перманганатының ерітіндісін, протарголды енгізу арқылы жұқа катетер (бренюль) арқылы жүруді қалпына келтіруден тұрды. Патологияның сипатын нақтылау және оңтайлы қол жетімділікті таңдау үшін хирургиялық емдеудің алдында лапароскопия болды. Урахус элементтерін толық кесу үшін кіші жастағы балаларда төменгі парумбиликальды қол жетімділік және егде жастағы балаларда жұмсақ төменгі ортаңғы лапаротомия қолданылды. Урахус кистасының іріңдеуімен бірінші қадам ошақты ашу және дренаждау, антибиотикалық терапия жүргізілді және суық мезгілде радикалды операцияға жүгінді. Қуық дивертикуласын хирургиялық емдеуде пфаненштильге қол жеткізу, қуықтан кіндікке дейін медианалық қатпарлы дивертикуланы кесу қолданылды. Алынған тіндер патогистологиялық зерттеуге жіберілді.

Емдеу әдістері

Урахустың даму ақауларына арналған консервативті терапия кіндік фистуласы (синус) болған жағдайда ғана мүмкін болады. Барлық басқа жағдайларда, сондай - ақ консервативті терапия тиімсіз болған жағдайда хирургиялық емдеу жүргізіледі. Егер белсенді қабыну процесі болса, алдымен инфекцияның өршуін анықтау керек. Егер жедел қабыну процесінде ауыр емдеу жүргізілсе, онда перитониттің және/немесе уросепсистің даму ықтималдығы өте жоғары.

Ашық хирургиялық араласулар

Түтіктің толық бітелмеуі (жұмыс істейтін везико-кіндік фистуласы). Науқастың артқы жағында жатып, алдымен оның алдыңғы қабырғасын жұмылдыруды жеңілдету үшін қуық уретральды катер арқылы толтырылады. Урахус арқылы қуыққа зонд немесе бояу енгізіледі. Әрі қарай, төменгі ортаңғы кесу жасалады (балалардағы қуықтың жоғары орналасуына байланысты кесу кіндікке жақын болуы керек) немесе терінің төменгі көлденең қимасы лобикалық симфизден жоғары. Кіндіктен қуықтың жоғарғы жағына дейін урахустың толық экстраперитонеальді кесілуі жүзеге асырылады. Қуық қабырғасының ақауы екі қатарлы тігістерді қолдану арқылы жойылады.

Кіндік фистула. Радикалды емдеу сонымен қатар кіндік бөлігімен бірге урахусты кесу болып табылады. Алайда, ерте жастағы балаларда фистуланың өзін - өзі емдеуге байланысты консервативті терапияға тырысқан дұрыс. Консервативті терапия қайталама инфекцияның алдын алуға және емдеуге бағытталуы керек.

Урахус кистасы. Емдеу тек хирургиялық. Кішкентай (жұқтырған және жұқтырмаған) кисталарды қуыққа дейін са - мим урахусымен бірге бір уақытта алып тастау керек. Үлкен кілттер алдымен іш қабырғасы арқылы ағып кетуі мүмкін. Кистаның іріңдеуімен хирургиялық емдеу 2 кезеңде жүзеге асырылады: бірінші кезең - кистаны ашу және жою, екіншісі – қабыну құбылыстары басылғаннан кейін оны урахуспен түбегейлі жою

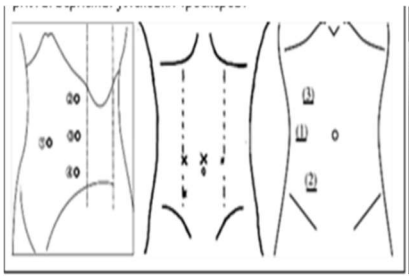
Қуық дивертикуласы. Апикальды дивертикуланы емдеу оны бүкіл уақытта толық кесуден тұрады. Қуық қабырғасының ақауы урахустың кіреберіс тесігінің шеңберіне екі қатарлы тігіспен жабылады.

Урахустың даму ақауларын лапароскопиялық емдеу Хирургиялық емдеу кіндік фистуласынан басқа урахустың даму ақауларын анықтаудың барлық дерлік жағдайларында қажет болғандықтан, іш қуысына кіру және оптикалық бейнелеу үшін троакальды (3 - тен 4 - ке дейін) қол жетімділік пен орналасудың бірнеше нұсқалары бар *(сурет. 2).* Авторлардың бір бөлігі аспаптарға арналған троакарларды құрсақ қуысының жартысына, бір бөлігі екі жағына орнатуды ұсынады. Көбінесе бейне-шаралар үшін троакар кіндік аймағына орнатылады, бірақ кейбір ав - лар (соның ішінде біздің тәжірибемізде) ортаңғы сызық бойымен кіндіктен 1-2 см жоғары орнатылады. Осы әдістердің әрқайсысы өмір сүруге құқылы.Киста мен байламның өзін максималды кесуде қорытындыны тікелей хирургиялық емдеу

Клиникалық тәжірибе:

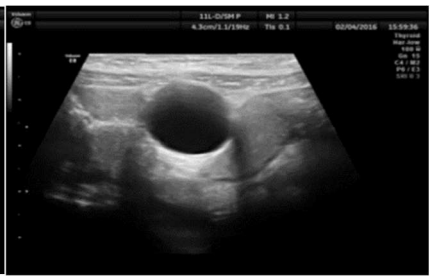
Урахус кистасы бар бір науқасты мысал ретінде жағдайлардың бірін қарастырайық. Клиникаға 3 жастағы баланың анасы ультрадыбыспен расталды *(сурет. 3*) урахус кистасы және алдын ала амбулаториялық жүргізілген консервативті антибактериялық терапия арқылы жүзеге асырылады. Анамнезінде шамамен 2 апта бұрын нәресте іштің ауырсынуына шағуды бастағаны анық болды. Ультрадыбыстық зерттеу кезінде "*урахус кистасы*" диагнозы қойылады. Сондай - ақ, ерте анамнезде ұзақ уақыт емделмейтін бүйрек жарасының болуы туралы айтылды (1 айдан астам).Бейнекамераны орнату және іш қуысын тексеру кезінде ортаңғы сызық бойымен кіндік сақинасынан 3 см төмен дөңгелек көлемді масса табылды *(сурет. 6).* Коагуляция арқылы қосымша құралдарды орнатқаннан кейін кистаның денесін алып тастау жүзеге асырылады (*сурет. 8).*Киста бөлініп, кесілгеннен кейін медианалық байлам қуық пен кіндікке қарай 2 см-ге бөлінеді, тігіледі, коагуляцияланады және кесіледі *(сурет. 9)*

Хирургиялық емдеуден кейін гемостазға тексеру жүргізілді – Толық. Троакарлар алынып тасталды, жаралар қабаттарға тігілді, косметикалық тігістер қойылды. Операциядан кейінгі кезең біркелкі өтті, бала 5-ші күні қанағаттанарлық жағдайда шығарылды.

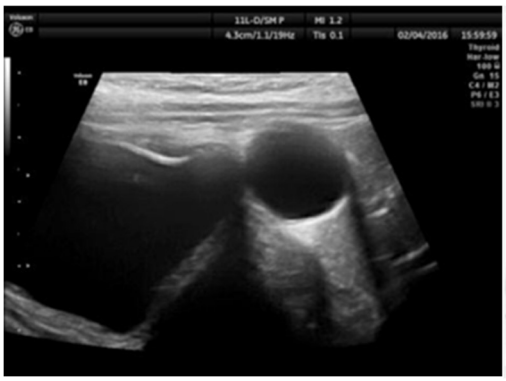


Сурет2. Троакарлардың орналасулары

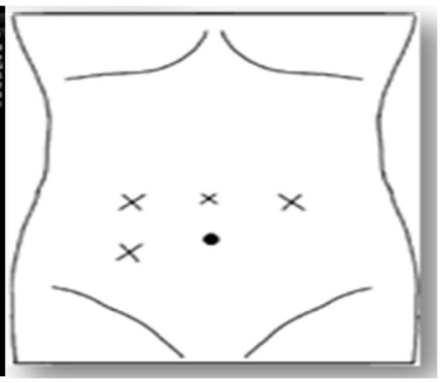
Сурет3. УДЗ



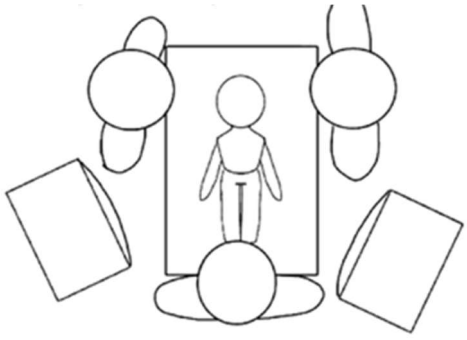
Сурет4. УДЗ



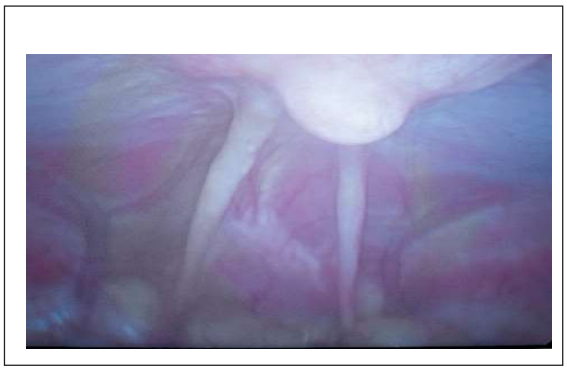
Сурет5. УДЗ



Сурет6. Троакарларды орналастысу



Сурет7. Дәрігерлерді орналастыру



Сурет8.операция сатылары

Сурет9.операция сатылары

Сурет10 операция сатылары

Қорытынды. Урахустың даму ақаулары балаларда жиі кездесетін аномалия болып табылады, алайда бұл аурудың кейбір нұсқаларының мүмкін симптомсыздығын, сондай - ақ 1-1,5 жасқа дейін жалғасатын каналдың таралуын ескере отырып, жиілік біртіндеп төмендейді. Асқынбаған және іріңді киста үшін таңдау операциясы оны зәр шығару жолымен бірге түбегейлі кесу деп санау керек. Минималды инвазивті хирургиялық емдеуді де осы патологияның таңдауы деп санау керек, өйткені лапароскопиялық қол жетімділікпен тіндердің зақымдану көлемі және операциядан кейінгі кезеңдегі ауырсыну синдромының ұзақтығы, баланың ауруханада болу уақыты айтарлықтай төмендейді, хирургиялық емдеудің косметикалық нәтижесі сапалы жақсарады.

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АҚПАРАТТЫҚ ТЕХНОЛОГИЯ САПАЛЫ БІЛІМ КӨЗІ

Танирбергенова Самал Балтабаевна
Ғылыми жетекші магистр, аға оқытушы, «Жалпы хирургия» кафедрасы, Қожа Ахмет Ясауи атындағы Халықаралық қазақ-түрік университеті, Түркістан қаласы, Қазақстан
Серикбаева Әсел Маратқызы
«Жалпы медицина» мамандығының 3-ші курс студенті, Қожа Ахмет Ясауи атындағы Халықаралық қазақ-түрік университеті, Түркістан қаласы, Қазақстан

Аңдатпа: *Бұл мақалада ақпараттық технологияның білім беру жүйесіндегі артықшылығы және білім алуда компьютермен жұмыс жасай алудың қажеттілігі туралы сипатталған. Ғылымдағы соңғы жаңалықтармен таныс болуы үшін ақпараттық технологияның қажеттілігі туралы айтылған. Ақпараттық технология білім берудің тиімді жолы.*

Кілттік сөздер: *ақпараттық технология, молекулалық биология, компьютер, интернет, оқулық, ғылым.*

Кіріспе

Қазақстан Республикасының Президенті Нұрсұлтан Назарбаев өзінің «Болашаққа бағдар: рухани жаңғыру» атты мақаласында: «Қазіргі таңда жеке адам ғана емес, тұтас халықтың өзі бәсекелік қабілетін арттырса ғана табысқа жетуге мүмкіндік алады. Бәсекелік қабілет дегеніміз – ұлттың аймақтық немесе жаһандық нарықта бағасы, я болмаса сапасы жөнінен өзгелерден ұтымды дүние ұсына алуы. Бұл материалдық өнім ғана емес, сонымен бірге, білім, қызмет, зияткерлік өнім немесе сапалы еңбек ресурстары болуы мүмкін. Болашақта ұлттың табысты болуы оның табиғи байлығымен емес, адамдарының бәсекелік қабілетімен айқындалады. Сондықтан, әрбір қазақстандық, сол арқылы тұтас ұлт XXI ғасырға лайықты қасиеттерге ие болуы керек. Мысалы, компьютерлік сауаттылық, шет тілдерін білу, мәдени ашықтық сияқты факторлар әркімнің алға басуына сөзсіз қажетті алғышарттардың санатында»-деген болатын[1].

Қазіргі кезеңдегі білім берудің мақсаты - жеке тұлғаның өзіне және қоғамға қажетті қабілеттерін дамыту, өзін-өзі тану және өздігінен білім алуды тиімді қамтамасыз ететін әлеуметтік құндылықтардың белсенділігін қалыптастыру болып табылады [2,3].

Оқытудың компьютерлік технологиясы «ақпараттық үдеріс» термині тарихта қазіргі байланыстар жүйесінің және компьютерлі техниканың даму салдары ретінде пайда болды. Сондықтан ақпараттық білім беру технологиясы біріншіден, педагогикалық технологиядағы негізгі талаптарын қанағаттандыру керек, ал екіншіден зерттеу біліктерін және өзіндік оқу әрекеттерінің дағдыларын қалыптастыру, студенттердің тұлғалық сапаларын дамыту және оқытушының дидактикалық қаруын кеңейтуге мүмкіндік беретін компьтерлерді пайдалану.

Студенттердің қажеттілігін қанағаттандыру үшін білім көзі болып табылатын ақпаратты алуы мен оны меңгеруін қамтамасыз ету керек. Осылайша бұл қажеттіліктің негізгі тірегі оқудың бағдарламалық-педагогикалық құралы және компьютерді пайдалануды жүзеге асыру болып табылады [4].

Негізгі бөлім

XXI ғасыр білім мен ғылым ғасыры болғандықтан білім берудің ең тиімді жолдарын қарастыруымыз керек. Дәл қазіргі кезде оқу орны мен студентті компьтерсіз елестету мүмкін емес. Кез келген сала мен пән бойынша толыққанды білім алу үшін компьютермен жұмыс жасай алу керек. Студент әр тақырыпқа дайындалғанда кітаптағы білімін ақпарат көздері арқылы толықтырып отыру қызығушылық пен ізденіске итермелейтіні анық. Ғылым тоқтаусыз жаңа ашылымдармен даму үстінде. Сондықтан осы ағысқа ілесу үшін оқытушы мен студент үнемі интернет көздерінен соңғы жаңалықтармен танысып отыруы тиіс.

Студенттердің өзіндік жұмысы белгілі бір тақырыптар болғанымен сол тақырыптар бойынша ғылымда қандай ашылған жаңалықтар бар екенін іздеп студенттер әкеліп талдау жүргізуі дұрыс.

Медицина факультеттерінде жүргізілетін молекулалық биология пәні биология ғылымының XX ғасырдың 50 жылдары қалыптасқан жаңа саласы. Бұл ғылым саласында күн санап жаңа зерттеулер ашылуда. Медицинаның толыққанды жоғары деңгейге жетіп, барлық ауруларды молекулалық деңгейде анықтап, сол деңгейде емдеуі осы ғылым саласына тікелей байланысты. Сондықтан XXI ғасыр молекулалық биология ғасыры деп аталуы бекер емес. Аталған салада ашылған жаңалықтардың оқулықтарға еніп үлгермеуіне орай интернет көздерінен үнемі білімді толықтырып отыру қажет.

Бұл тек бір пән саласына келтірілген мысал, қалған пәндердеде интернет көздерінен материалдар алу мен іздену бүгінгі күн қажеттілігі екені айқын нәрсе.

Күнделікті сабаққа дайындалу кезінде оқулықпен қатар компьютерді пайдаланудың тиімділігі жоғары.

Оқулықпен жумыс жасағанда студент кітапты оқып өз бетінше түсініп оның түсінігін жаза алады, материалды оқып отырып көру арқылы да есте сақтайды, берілген сұраққа жауап іздейді, кейбір бөліктерін жаттап алуы да мүмкін. Кітап оқу оқыған нәрсені түсінуге тәрбиелейді. Бұл студентті жауапкершілікке әкеледі.

Инновациялық технологиялар – ең озық, ең жаңа технологиялар. Ғылым мен білімдегі инновация – бұл жаңа өнертабыстар мен инновациялық оқыту әдістерін қолдану. Яғни, оқу үрдісінде озық технологияларды қолдану. Инновациялық технологияларға оқытудың мақсаты – білім алушылардың шығармашылық ойлауын, шығармашылық әлеуетін қалыптастыру және кәсіби құзыреттіліктерін дамыту. Қазіргі уақытта ең кең тараған технологиялық бағыттар компьютерлер болып табылады: білім беру мақсатында оқушыларға оқу материалын беру құралы; қосымша ақпарат көзі ретінде оқу үдерістерін ақпараттық қамтамасыз ету құралы; білім деңгейін анықтау және оқу материалын меңгеруді бақылау құралы; білімді практикалық қолдану дағдыларын меңгеруге арналған әмбебап тренажер; оқытылатын пән бойынша оқу эксперименттері мен іскерлік ойындарды жүргізуге арналған құрал.

Білім беруде компьютерлерді пайдалану білім сапасын арттыруға, тәрбиелік ықпал етудің жаңа құралдарын жасауға, мұғалімдер мен оқушыларға компьютермен тиімді әрекеттесуге мүмкіндік беретін ақпараттық білім беру технологияларының жаңа буынының пайда болуына әкелді. Көптеген сарапшылардың пікірінше, компьютерлік құралдарға негізделген жаңа ақпараттық білім беру технологиялары сабақтардың тиімділігін 20-30% арттыруға мүмкіндік береді. Компьютердің білім беру саласына енуі оқытудың дәстүрлі әдістері мен технологияларын және бүкіл білім беру саласын революциялық түрлендірудің бастамасы болды.

Интернет желілермен жұмыс жасағанда студент компьтер мүмкіндіктерін пайдаланып әлемдік жаңалықтармен таныса отырып, тақырып деңгейін кең көлемде түсінуге және ізденіске ұмтылады. Интернет желілерімен жұмыс істегенде студенттердің ақпараттық мәдениеттілігі қалыптасады. Тапсырмаларды слайд түрінде жасап толыққанды

түсінеді. Студент кез-келген тақырып бойынша толық білім алып, дамыту үшін сабаққа қатысуы оқулық, ақпарат құралдарын ұштастыруы өте орынды (1-кесте).

Кесте 1- Толық білім алу көздері

Оқу үдерісін визуалды ақпараттар үлесін арттыру көмегімен жетілдіру мәселесі білім беру қызметінің әдістемелік, техникалық және ұйымдастырушылық аспектісін жетілдіруді талап етеді.

Оқу үдерісінде ақпараттық технологияларды қолданудың ерекше белгісі әртүрлі формадағы ақпаратты ұсыну болып табылады, олар: мәтіндер, кестелер, графиктер, диаграммалар, аудио және бейне үзінділер, сондайақ олардың үйлесімдері.

Осындай мультимедиялық білімгерге сана ішілік реакцияны қосумен оқу материалдарын жақсы қабылдау мен есте сақтауға қабілетті ететін психологиялық шарттар туғызады[4].

Бүгінгі таңда жаңа ақпараттық технологияларға ғалымдар әрқилы анықтамалар беріп отырғаны анық. Н.Макарова " жаңа ақпараттық технологияларға - қысқаша компьютер негізіндегі технология" деп анықтама берген[5]. М.И.Жильдак бұл терминнің неғұрлым кеңірек анықтамасын береді. Ол "Жаңа ақпараттық технологиялар - адамдардың білімін кеңейтіп, олардың техникалық және әлеуметтік үрдістерді басқару мүмкіндігін дамытатын, ақпаратты жинау, ұйымдастыру, сақтау, өңдеу, тасымалдау және жеткізудің техникалық құралдары мен әдістерінің жиынтығы" деп дәлелдеген.

Компьютер және ақпараттық технологиялар арқылы жасалып жатқан оқыту процесі оқушының жаңаша ойлау қабілетін қалыптастырып, оларды жүйелік байланыстар мен заңдылықтарды табуға итеріп, нәтижесінде – өздерінің кәсіби потенциалдарының қалыптасуына жол ашады. Бүгінгі таңдағы ақпараттық қоғам аймағындағы оқушылардың ойлау қабілетін қалыптастыратын және компьютерлік оқыту ісін дамытатын жалпы заңдылықтардан тарайтын педагогикалық технологиялардың тиімділігі жоғары деп есептейміз.

Интерактивті тақтаның маңыздылығы:

- Интерактивті тақтада жазба құралдары, маркерлер, құралсаймандар панелі қарастырылған.
- Интернетке қосылу мүмкіндіктері бар.
- Жұмыс материалдарын, ақпаратты оқушыларға тиімді жеткізуге мүмкіндік береді.
- Оқушылардың зейінін аударуға болады.
- Анимациялық роликтер, коллекциялық суреттерді оқушылар назарына ұсына аламыз.

- Арнайы бағдарламалар әзірлеп, веб сайттар мен кез-
келген қосымшалардан ақпарат алып, өңдеу жұмыстарын жүргізуге болады.

Біздің студенттеріміз алған білімдерін маман болған кезде толық пайдалана алуы керек. Ол үшін электронды материалдарды жақсы игеріп, танымдық белсенділігі жоғары болып, шығармашылық жағдайда жұмыс жасай алуы қажет.

Күн санап қарқынды дамып келе жатқан ақпараттық қоғамда ғылым мен өндірістің дамуының негізгі құралы болып ақпараттық ресурстардың қажеттілігі артып келеді. Яғни біздің білім беру саламызда сапалы қарқынды даму үшін жаңа қадамдарға баруда. Барлық білім салаларында ұрпағымызға ақпараттар кеңістігінде дұрыс бағытты таңдауға мүмкіндік жасай алатын оқытудың жаңа технологиялары пайда болуда.

Студенттер кез келген сабаққа дайындалуда ақпараттық технологияны пайдалану студентке тиімділігімен қатар өркениетті үйрете бастайды (2-кесте).

Кесте 1- Ақпараттық технологияның артықшылығы

Бүгінгі таңда студенттерге оқулықтың маңыздылығымен қатар, компьютер де қоршаған әлемді кең көлемде танудың аса құнды құралы болып табылады. Сондықтан, барлық кабинеттерде компьтер немесе электронды тақталардың болуы– бүгінгі таңның кезек күттірмейтін өзекті мәселелерінің бірі.

Ақпараттық технология оқу орны мамандарының жұмысының тиімділігін жүзеге асыра отырып, студенттерге жан-жақты білім беруші құрал десекте болады.

Қорытынды

Қорыта айтқанда компьютерді қолдану барысында студенттер мынадай мүмкіндіктерге ие болады:

1. Берілген тақырыптың мағынасын кең көлемде қарастырып, түсінеді;
2. Студент берілген тапсырманы орындау кезінде ғылыми зерттеуге бет бұрып, ізденушілік пен мамандыққа деген қызығушылық туындайды.
3. Интернет көздерінен ақпараттар қарастырғанда әртүрлі көрнекіліктермен танысуға болады.

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ДИАГНОСТИКА И ЛЕЧЕНИЯ ВИСЦЕРАЛЬНОГО АКТИНОМИКОЗА

Каукешова Нурсулу Агзамовна
Преподаватель, Международного казахско-турецкого университета имени Ходжи Ахмеда Ясави, Медицинский факультет, кафедра «Хирургические заболевания», г.Туркестан, Казахстан
Бектемір Махдия Маратқызы
Студент 3-го специальности «Общая медицина», Международного казахско-турецкого университета имени Ходжи Ахмеда Ясави, г.Туркестан, Казахстан

Аннотация: Актиномикоз - это хроническое гнойное заболевание, которое вызывается лучистыми грибами, поражает людей трудоспособного возраста, длится годами и наносит значительный медицинский, социальный и экономический ущерб народному хозяйству. заболевания, особенно его висцеральных форм, обусловлена формированием хронического специфического воспаления в мягких и костных тканях практически любых локализаций, присоединением в 70-80 случаев бактериальной флоры, нарушением функций пораженных органов, развитие в практике врачей различных специальностей и среди хронических гнойных заболеваний составляет 5-10/5.

Однако, организация центров не была осуществлена и специализированная помощь больныи висцеральны «актииоппсозп". по--прежнеыу запаздывает, Больше, как правило, поступает под наблюдениепоздние сроки заболевания из-за трудностей его диагностики на ранних стадиях, недостаточного знакомства практических врачей с разнообразными клиническими Лэркэга заболевания, отсутствием во многих лечебных учреждениях микологических лабораторий и т.д. Это в свою очередь утяжеляет картину актинсмикотических поражений, снижает защитные реакции организма, создает трудности в лечении, удлиняет периоды выздоровления. В ряде случаев трудности диагностики и лечения приводя к невозможности радикальной хирургической операции и инвалидности.

Все вышеизложенное указывает на необходимость усовершенствования диагностики актиномикоза на гестах, разработки более эффективных схем консервативного лечения в пред- и послеоперационном периодах, методов хирургического лечения, разработки кегодик антибиотике- и иммунотерапии. Назрела необходимость изучать. эпидемиологию и наметить пути профилактики этого заболевания.

Введение: Актиномикоз – относительно редкое заболевание, возбудителями которого являются актиномицеты. Актиномицеты являются бактериями, а не грибами, входя в порядок Actinomycetales, объединяющий микроорганизмы, способные к образованию ветвящихся и мицелиальных клеток. Характерной их особенностью, отличающей от грибов, является отсутствие перегородок внутри нитей, и весь мицелий состоит из одной клетки. Актиномикоз протекает в виде хронического гранулематозного воспаления с поражением различных органов и систем. Бактерии грамположительны, спор не имеют. В пораженных тканях возбудитель создает специфическое морфологическое образование – актиномикотические друзы, которые имеют вид сплетения тонких микроколоний актиномицетов. При попадании актиномицетов в ткань, вокруг них образуется актиномикотическая гранулема, которая представляет собой воспалительную реакцию с усиленной миграцией нейтрофилов с формированием гнойника, вокруг которого

происходит скопление эпителиоидных и гигантских многоядерных клеток, а также ксантомных клеток с большой светлой пенистой цитоплазмой.

Возбудитель актиномикоза - лучистый гриб, относящийся к обширному порядку грибов актиномицетов.

В гранулематозных тканях и экссудате гриб обнаруживают в виде маленьких серых зерен (друз) серого или светло-желтого цвета. В старых очагах они темно-желтые, плотной консистенции, часто обызвествленные.

Колония гриба (друза) состоит из кокков, палочек различных размеров и ветвящегося мицелия, окрашивающихся по Граму положительно. В неокрашенных препаратах элементы гриба, составляющие его колонию (друзу), имеют зеленоватый цвет.

При прогрессировании процесса происходит образование новых гранулем, при слиянии которых формируются обширные очаги, придающие ткани сотовое строение, за счет желто-серых полей гранулемы с мелкими гнойными полостями. Гистологическая картина напоминает инвазивный рост злокачественных опухолей, за счет свойственного для актиномицетов роста в макроорганизме путем распространения по протяжению. Актиномицеты распространяются по клетчатке и межмышечным пространствам, образуя свищи как наружные, так и внутренние. Поэтому отличительной особенностью актиномикоза является инвазивный рост и свищеобразование. По локализации патологического процесса выделяют актиномикоз шейно-лицевой, легочный, кожный, абдоминальный и актиномикотическую септицемию. Именно редкость и опасность данной формы патологии, сложность и важность своевременной диагностики являются основной причиной актуальности рассмотрения каждого конкретного случая висцерального актиномикоза.

Заболевание встречается во всем мире, как правило, спорадически. Чаще заболевают мужчины, преимущественно жители городов. Инкубационный период не установлен. Актиномикоз может протекать остро или перейти в хроническую форму с периодическими обострениями. При каждой форме характерно развитие плотного малоболезненного отека, который в дальнейшем размягчается и образует свищ. Подкожно-подмышечная форма может сопровождаться повышением температуры тела до 38 'С, головной болью, общим недомоганием. Поражение бронхов протекает по типу гнойного бронхита, поражение легких - как пневмония; возможно возникновение абсцесса легкого. Абдоминальная форма чаще проявляется образованием очага поражения в кишечнике и сопровождается болями, повышением температуры тела, нарушениями функций пищеварительного тракта, признаками раздражения брюшины. Возможно поражение других органов и тканей: полости носа и носоглотки, щитовидной железы, почек и др. Иногда наблюдается распространение возбудителя с кровью, в результате чего развивается генерализованный актиномикоз, клиническая картина которого напоминает сепсис. В этом случае заболевание нередко заканчивается смертью больного.

В данной статье представлен клинический случай редкой формы актиномикоза – висцеральный актиномикоз. Редкая встречаемость висцерального актиномикоза, отсутствие специфических симптомов заболевания, тяжелое течение и развитие осложнений, приводящих к инвалидизации пациентов работоспособного возраста и снижению качества жизни, делают актуальными вопросы своевременной диагностики и лечения данного заболевания.

Материалы и методы исследований: Проведен анализ истории болезни пациентки Т., 19 лет, которая находилась на лечении в отделении гнойной хирургии ШНОС г. Туркестан

Результаты исследования: Пациентка Т., 19 лет, поступила в экстренном порядке ШНОС в г. Туркестан 14.11.2018 г. С жалобами на наличие болезненного инфильтрата в правой подвздошной области, повышение температуры тела, общую слабость. За две недели до госпитализации беспокоила периодическая тянущая боль и дискомфорт в правой подвздошной области. Через 3-4 суток в данной области появилось умеренно болезненное уплотнение. Самостоятельно не лечилась, за медицинской помощью не обращалась. Инфильтрат увеличивался в размере, усиливалась боль в нём, к концу второй недели заболевания стала повышаться температура тела до 38,0- 38,5 0 С, нарастала общая слабость, ввиду чего 13.11.2018 г. Вызвала бригаду скорой медицинской помощи, доставлена в Муниципальный перинатальный центр г. Туркестан Пациентка была госпитализирована в гинекологическое отделение, для обследования и лечения с учётом анамнеза заболевания и недавних родов (роды были в августе 2015 г., первые, естественные, в срок, без каких-либо интранатальных и постнатальных осложнений). При обследовании в ОАК Hb-79 г/л, L-27,7 х 10 9 /л с резким сдвигом лейкоформулы влево (п/я-24%, с/я-60%), показатели биохимического анализа крови в пределах нормы. Выполнено УЗИ органов малого таза, брюшной полости – в брюшной полости обнаружено образование, занимающее справа гипогастрий, мезогастрий. Задняя стенка мочевого пузыря и его дно утолщены до 8-9 мм. Стенка гипоэхогенная, слоистая, структура нарушена. Внутренний контур мочевого пузыря чёткий. Наполнение мочевого пузыря слабое. Из верхней части мочевого пузыря исходит образование примерно 110х40 мм с неровным контуром, неоднородной солидной структуры, обильно васкуляризованное, имеющее сосудистую связь с мочевым пузырём, касающееся матки, чётко дифференцирующееся от неё, окружено сальником. На уровне средней и верхней части образования резко утолщена мышца передней брюшной стенки, снижена эхогенность, локально нарушена граница с вышеописанным образованием, имеется сосудистая связь с ним. Выше, в подкожной жировой клетчатке, образование примерно 130х45 мм с неровным местами нечётким контуром, выражено неоднородной солидной структуры, с расширенными сосудами. Образования образуют единый конгломерат. 14.11.18 г. пациентка была и переведена в отделение гнойной хирургии с предварительным диагнозом – Новообразование забрюшинного пространства. Абсцедирование 14.11.2018 г. По показаниям была выполнена экстренная операция, в ходе которой вскрылся абсцесс в правой подвздошной области (выделилось около 40,0 мл гной), при ревизии была обнаружена опухоль передней брюшной стенки, занимающий правый мезогастрий и распространяющаяся в сторону мочевого пузыря к лону. Ткань опухоли представляла собой детрит черно-багрового цвета, фрагментировалась, часть детрита взята на гистологическое исследование. Случай был расценен как злокачественная опухоль передней брюшной стенки, T4NxMx с прорастанием мочевого пузыря и абсцедированием. На 4-е сутки после операции, получен результат гистологического исследования, который не подтвердил онкологический процесс. В исследуемом материале обнаружены друзы актиномикоза. На 6-е сутки выполнено контрольное УЗИ передней брюшной стенки и мочевого пузыря – в околопупочной области справа несколько ниже пупка определяется гипоэхогенный участок около 11х22 мм с неровными, но довольно чётким контуром с неоднородной структурой – инфильтрат передней брюшной стенки.

В подвздошной области справа определяется участок с неровным нечётким контуром 100х118 мм с выражено неоднородной структурой без жидкостного компонента с переходом на паховую область – инфильтрат. 02.12.2018 г. выполнена операция – релапаротомия, иссечение части мышечно – апоневротических тканей брюшной стенки (апоневроза наружной косой мышцы живота, внутренней косой мышцы, поперечной

мышцы, прямой мышцы), резекция мочевого пузыря, тубэктомия справа, паравазальной лимфодиссекции справа, дренирование брюшной полости.

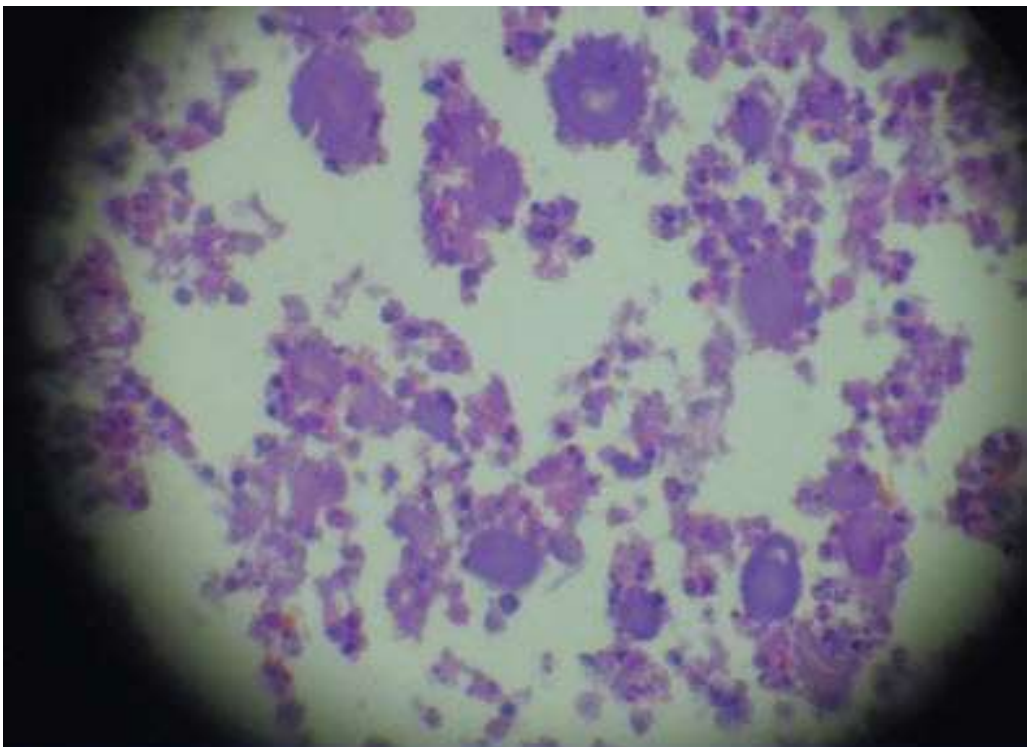

Рисунок 1. Друзы актиномицетов

Резекция выполнена по причине поражения тканей грибковым процессом. В материале резецированного участка мышц передней брюшной стенки получена фиброзно-мышечная ткань с полосами воспалительной инфильтрации. Данная морфологическая картина характерна не только для актиномикоза, но и для любого неспецифического воспаления. Но, учитывая данные предшествующих гистологических исследований, можно утверждать о том, что данная картина в исследуемых материалах все-таки более характерна для актиномикоза. В гистологическом препарате резецированного участка мочевого пузыря и правой маточной трубы было обнаружено обилие ксантомных клеток, свойственных актиномикозу. К оперативному лечению было добавлено консервативное – флуконазол, хемомицин, метрогил. После окончания курса антибактериальной терапии начато иммуномодулирующее лечение актинолизатом (4 курса по схеме 1 курс – №25, 2 курс – №15, 3 курс – №10, 4 курс – №5, интервал между курсами 1 месяц). На фоне проводимого лечения клинически и по данным лабораторных исследований отмечалась положительная динамика. Пациентка выписана в удовлетворительном состоянии на 44-е сутки после первой операции.

Челюстно-лицевая форма актиномикоза у человека – результат распространения возбудителя в подкожную клетчатку из хронических очагов инфекции в ротовой полости и глотке. Частая локализация – угол нижней челюсти, шея. Появляются глубокие безболезненные уплотнения, которые нагнаиваются, формируются свищи. Поражаются также лимфатические узлы и слюнные железы. Течение хроническое, рецидивирующее. Характерны лихорадка, признаки местного воспаления. Осложнения – воспаление оболочек головного мозга.

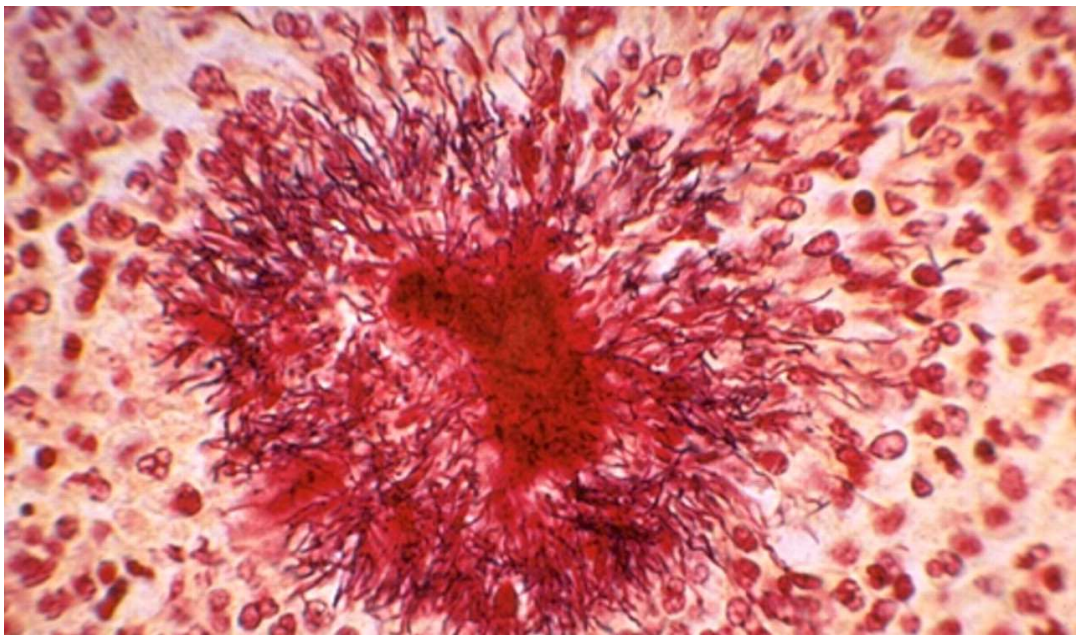

Рисунок 2. Актиномицеты

Рисунок 3. Челюстно-лицевая форма актиномикоза у человека

Выводы: На примере данного клинического случая, было показано сходство висцерального актиномикоза с онкологическим процессом. Инвазивное поражение тканей, неспецифическая клиническая картина определяет трудность диагностики и сложность постановки верного диагноза. Диагноз актиномикоза устанавливается только на основании результатов гистологического исследования материала полученного из очага воспаления.

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ХИРУРГИЧЕСКИЕ МЕТОДЫ ВВЕДЕНИЕ ПАЦИЕНТОВ С БЕДНЫМ ОВАРИАЛЬНЫМ ОТВЕТОМ НА КОНТРОЛИРУЕМУЮ ОВАРИАЛЬНУЮ СТИМУЛЯЦИЮ

Валиев Равиль Камилевич

к.м.н. репродуктолог, акушер-гинеколог, ТОО Международный Клинический Центр Репродуктологии «Persona», Алматы, Республика Казахстан

Кемел Акмаржан Бахабудинкызы

резидент акушер-гинеколог, НАО «Казахский Национальный Медицинский Университет им. С.Д. Асфендиярова», Алматы, Республика Казахстан

Аннотация. Бедный овариальный ответ на COS (COS - controlled ovarian stimulation - контролируемая овариальная стимуляция) - серьезная проблема, возникающая во время процедур экстракорпорального оплодотворения и переноса эмбрионов. Многие женщины, проходящие контролируемую овариальную стимуляцию, могут страдать от плохого ответа яичников (БОО), и в настоящее время ее частота имеет тенденцию к увеличению у молодых пациенток. Среди женщин, которые получают контролируемую овариальную стимуляцию, частота БОО достигла 9%–24% [1].

Ключевые слова: бедный овариальный ответ, система промывания фолликулов, омоложение ооцитов, лапароскопический разрез яичников, иглоукалывания яичников.

Abstract. Poor ovarian response to controlled ovarian stimulation is a serious problem that occurs during in vitro fertilization and embryo transfer procedures. Many women undergoing controlled ovarian stimulation may suffer from a poor ovarian response (POR), and currently, its frequency tends to increase in young patients. Among women who receive controlled ovarian stimulation, the frequency of POR reached 9%-24% [1].

Keywords: poor ovarian response, follicle washing system, oocyte rejuvenation, laparoscopic incision of the ovaries, acupuncture of the ovaries.

Бедный овариальный ответ (БОО) — это патологическое состояние, характеризующееся низкой реакцией яичников на контролируемую стимуляцию яичников.

Система классификации пациентов с бесплодием с “ожидаемой” или “неожиданной” неадекватной реакцией яичников на экзогенные гонадотропины — критерии POSEIDON (Patient Oriented Strategies Encompassing IndividualizeD Oocyte Number) — была разработана, чтобы обеспечить более детальную картину БОО и помочь врачам в ведении таких пациентов [2].

Группа POSEIDON представила "критерии получения достаточного количества ооцитов, необходимого для получения по крайней мере одного эуплоидного эмбриона для переноса" в качестве промежуточного маркера успешного исхода в циклах ЭКО / ИКСИ. Так же разработан калькулятор для автоматического прогнозирования исходов: первый использует информацию анамнестических данных расчёта минимального количества

зрелых ооцитов для получения ≥1 эуплоидной бластоцисты, а другой основан на фактическом количестве полученных зрелых ооцитов и оценки шансов получения эуплоидной бластоцисты с использованием этой когорты ооцитов в ЭКО / ИКСИ. Новый калькулятор ВРТ может помочь в клиническом консультировании и индивидуальном планировании лечения данной группы пациентов [3]. Следует также упомянуть, что контролируемая стимуляция яичников для сохранения фертильности у пациенток со злокачественными новообразованиями также может быть сложной задачей. Хотя не было доказано, что тип рака оказывает существенное влияние на овариальный резерв и реакцию яичников [4], у пациенток с раком высокой степени злокачественности наблюдается снижение количества извлеченных зрелых ооцитов и криоконсервированных эмбрионов [5].

Цели литературного обзора. Определить эффективность хирургических методов при контролируемой овариальной стимуляции с бедным овариальным ответом.

Материалы и методы.

Поиск литературы был произведен по всем типам клинических исследований на русском и английском языках, согласно следующим ключевым словам и фразам, связанным с темой методы введение пациентов с бедным ответом яичников: "бедный овариальный ответ", "система промывания фолликулов", "омоложение ооцитов" и "лапароскопический разрез яичников", "иглоуколывания яичников". В рамках обзора использовались такие научные базы данных, как PubMed, Scopus, Web of Science и Google Scholar. Критерии отбора литературы включали актуальность (публикации, посвященные настоящей теме не старше 10 лет) и релевантность исследований теме обзора, а также доступность полных текстов статей.

Результаты.

Омоложение ооцитов

Замена цитоплазмы — это как стратегия улучшения качества ооцитов, учитывая ключевую роль митохондрий и других клеточных компонентов в достижении компетентности ооцитов. Действительно, этот интересный терапевтический подход основан на том факте, что несколько важных компонентов, таких как белки, компоненты, производящие энергию, РНК и митохондрии, расположены в цитоплазме молодых и здоровых ооцитов и способствуют правильному функционированию гамет; таким образом, можно предположить, что перенос этих факторов может привести к омоложению ооцитов за счет улучшения процессов созревания, оплодотворения и развития эмбриона. В этом исследование методы обогащения митохондрий, заключающиеся в переносе цитоплазмы из гетерологичных клеток или из аутологичных стволовых клеток яичников, стволовых клеток, полученных из жировой ткани, и клеток гранулезы, были недавно предложены в качестве метода улучшения качества БОО ооцитов [6]. В исследовании проведенному в 2021 году приняли участие 38 женщин 31-45 лет с низким овариальным резервом и по крайней мере двумя неудачными попытками получить свои яйцеклетки с помощью ЭКО. Омоложение ооцитов проводилось с помощью богатой тромбоцитами аутологичной плазмы (PRP). Инъекции PRP в яичники были выполнены под контролем ультразвука или с помощью лапароскопии. В итоге отмечалось значительное улучшение уровня гормонов; родилось шесть здоровых детей, было достигнуто десять беременностей, и четыре из десяти были от естественного зачатия. Инъекции PRP в яичники являются безопасным, продуктивным и естественным методом лечения, который может помочь женщинам с преждевременной недостаточностью яичников родить собственного ребенка [7]. В клиническом случае, описанном Sfakianoudis K. et al. [8], 40-летней женщине с БОО в анамнезе в возрасте 35 лет, с фолликулостимулирующим гормоном 149 мМЕ / мл и АМГ 0,02 нг / мл, была проведена внутриовариальная инъекция PRP с целью попытки зачатия. У пациентки через 6 недель возобновились менструации, уровень ФСГ снизился до 27 мМЕ /мл, а уровень АМГ

увеличился до 0,08 нг /мл. Пациентка прошла естественный цикл ЭКО и после переноса эмбриона пациентка забеременела, но на 5 неделе беременности произошел самопроизвольный выкидыш. В аналогичном исследовании [9] у пациентки возобновились менструации через 25 дней после лечения, и она прошла два цикла COS для ЭКО в течение следующих 2 месяцев. В каждом цикле ЭКО было получено 3 яйцеклетки. В общей сложности было перенесено три эмбриона на стадии расщепления, что привело к успешной беременности и последующему живорождению близнецов, а также аналогичном исследовании отмечалось живорождение после естественного зачатия у 41-летней женщины со сниженным овариальным резервом с предшествующим анамнезом 12 неудачных циклов ЭКО, которая получала инъекцию активированного PRP внутри яичников [10]. Омоложение ооцитов показали хорошие результаты у пациентки со сниженным овариальным резервом в результате которые получили беременность и живорождение после ЭКО а также естественное зачатие.

Система промывания фолликулов иглой с двойным просветом

Несмотря на ограниченные данные, подтверждающие использование промывания фолликулов [11], это продолжает оставаться обычной практикой во многих клиниках по лечению бесплодия [12]. Horn K. et al. в 2017 году исследовали систему промывания фолликулов двухпросветной иглой, сравнив ее с однопросветной аспирационной иглой у пациенток с ЭКО с плохой реакцией яичников. К сожалению, промывание фолликулов не привело к увеличению количества ооцитов, хотя и удвоило продолжительность процедуры [13].

Лапароскопические разрезы всего яичника

Общим элементом этих методов лечения является механическое нарушение тканей внеклеточного матрикса яичников [14]. Подход IVA (активации in vitro) может быть использован у пациентов с DOR (уменьшением резерва яичников) и POI (первичной недостаточностью яичников). Поскольку у этих пациентов происходит спонтанная активация спящих примордиальных фолликулов, достигающих вторичной стадии, у этих пациентов может быть стимулирован рост вторичных фолликулов с использованием немедикаментозной IVA без культивирования ткани. Для пациентов с яичниками, содержащими остаточные вторичные фолликулы, вполне вероятно, что только шаг фрагментации (нарушение передачи сигналов Hippo) будет достаточным для стимулирования роста фолликулов [15-16]. В этом направлении Chia L. et al. 2022 году провели исследование и предположили, что упрощенная процедура лапароскопического разреза всего яичника может обеспечить внутренние стимулы, необходимые для активации покоящихся фолликулов у пациенток с крайне плохой реакцией яичников, у которых был незначительный шанс забеременеть собственными яйцеклетками с помощью современной практики экстракорпорального оплодотворения. После лечения ЛРВЯ у 5 из 6 пациенток наблюдалось значительное повышение уровня эстрадиола в сыворотке и улучшение роста фолликулов ($p = 0,001$). У каждой из этих пациенток было извлечено несколько яйцеклеток, и это привело к циклам переноса размороженных эмбрионов у 4 пациенток ($p = 0,010$). В среднем продолжительность от процедуры ЛРВЯ до первого извлечения яйцеклетки составила 24 дня (от 11 до 58 дней). После перенос эмбрионов 2 пациентки забеременели и родили здоровых детей. Двум другим пациентам была проведена ЭТ, и 1 привела к химической беременности. У одной пациентки были криоконсервированные эмбрионы, ожидающие переноса [14]. В аналогичном исследовании, которые включили 4 пациента, результаты показали у 2-х пациентов ежемесячная «собирательная» программа в ЕМЦ с получением М2, а у 2-х пациентов появление ретенционных образований до 11 мм с исходом. А также повышение уровня эстрадиола по сравнению с дооперационным периодом увеличилось в 1,4 раза [17].

Иглоукалывания для улучшения функции яичников у женщин с плохой реакцией яичников.

Иглоуколывания яичников может улучшить показатели у женщин с плохим ответом яичников. По этому поводу для сравнения были изучены семь клинических РКИ (которые включили 516 женщин). Качество включенных исследований, как правило, было низким или очень низким. Что касается мета-анализа, семь исследований показали, что по сравнению с терапией контролируемой гиперстимуляцией яичников (КГЯ), иглоукалывание в сочетании с терапией КГЯ может значительно увеличить частоту имплантации, количество извлеченных яйцеклеток (p<0,00001), толщина эндометрия (p=0.01) и количества антральных фолликулов (p<0,00001), снижают уровень фолликулостимулирующего гормона (p= 0,0009) и повышения уровня эстрадиола (E_2) (p<0.00001). Однако не наблюдалось статистических различий в улучшении клинической частоты наступления беременности, частоты оплодотворения, количества эмбрионов высокого качества, показателей ЛГ, АМГ или снижении дозы гонадотропина между группами иглоукалывания плюс терапия КГЯ и группой терапии. Иглоукалывание является безопасным и эффективным методом улучшения БОО и обладает большим потенциалом в регулировании уровня половых гормонов и улучшении овариального резерва. Однако неоднородность включенных исследований повлияла на результаты, особенно в лечении иглоукалыванием, выборе точек акупунктуры и техниках иглоукалывания [18].

Выводы: Предложенные хирургические методы лечения БОО значительно увеличили количество яйцеклеток, извлеченных в течение овариального цикла, количество жизнеспособных эмбрионов или показатели живорождаемости. Процедуры, повреждающие яичники (лапароскопический разрез, иглоуколывания), вызывают биохимические изменения (увеличение количества факторов роста и ингибиторов апоптоза), способствующие росту фолликулов у пациенток с различными формами бесплодия яичников, а также улучшения качества ооцитов за счет усиления функций митохондрий яичников (омоложение ооцитов) могут улучшить качество ооцитов, что приводит к естественному зачатию или успешному получению зрелых яйцеклеток для последующего оплодотворения в программах ЭКО.

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MYCOPLASMA PNEUMONIA IN CHILDREN CAUSED BYMYCOPLASMA PNEUMONIAE

Kadir Asem Zhanibekkyzy
Student, NJSC Astana Medical University, Republic of Kazakhstan, Astana
Shonykbaeva Saltanat Sapargalievna
scientific supervisor, master of natural science, teacher, NJSC Astana Medical University, Republic of Kazakhstan, Astana
Yerubay Aidana Suyunshibaykyzy
scientific supervisor, master of natural science, teacher, NJSC Astana Medical University, Republic of Kazakhstan, Astana

ANNOTATION
Mycoplasma pneumoniae, an obligate parasitic pathogen without a cell wall that can cause severe upper and lower respiratory tract symptoms. It is the causative agent of bronchitis and pneumonia in humans. In addition to severe respiratory symptoms, after infection with M. pneumoniae, clinical extrapulmonary manifestations from the skin, brain, kidneys, musculoskeletal system, digestive system and even the circulatory system are observed. Intrapulmonary and extrapulmonary pathogenetic mechanisms of M.pneumoniae infection are independent and interrelated, and also have certain common features. In fact, the pathogenetic mechanisms of M. pneumoniae are complex, and the specific content is still not fully clear, further studies are needed to determine the detailed pathogenesis of M. pneumoniae. This review article describes data on the effects of M. pneumoniae on bronchial epithelial cells and respiratory tract in children.
Keywords: mycoplasma pneumonia, M. pneumoniae, lungs, infection, children

Respiratory diseases, despite the successes achieved, according to official statistics [1], occupy a leading position in the structure of childhood morbidity. Globally, M. pneumoniae infection occurs as a regional outbreak every 3-7 years, with each outbreak lasting 1-2 years. Major epidemics occurred in Asia and Europe between 2010 and 2012. [2] There was a slight peak from June to July 2023, and a slight decrease in China in August. In Europe, the "most frequent cases" were identified in Denmark, Sweden, Switzerland and Wales. Several European countries have recently reported an increase in the number of cases. Danish health officials said that since the summer there has been an increase in the number of mycoplasma pneumoniae infections, with "significantly more than usual." In France, an "unusual increase" in the incidence of respiratory infections caused by mycoplasma pneumoniae has been reported: cases have increased since the beginning of autumn, and compared to 2019 and 2022, the number of cases has increased, reflecting the epidemic situation. In Kazakhstan, the incidence of M. pneumoniae tends to increase, and there are reports of a high incidence rate. In the Russian Federation, more than 50% of hospitalized children are diagnosed with mycoplasma pneumonia (MPP) in the respiratory department. Due to the increase in the number of children with mycoplasma pneumonia, this epidemic has attracted universal attention. The cause of this M.pneumoniae epidemic remains unclear. As a rule, mycoplasma community-acquired pneumonia is characterized by a mild course and does not require hospitalization. Due to this clinical feature, it is sometimes figuratively characterized as “walking pneumonia” (“walking pneumonia”, i.e., carried “on your feet”) [20]

Mycoplasmas are a group of small microorganisms with a minimal genome, capable of autonomous existence and reproduction. Mycoplasmas are conditionally pathogenic organisms living in the human body on the mucosal surfaces of the urogenital and respiratory tract. They do not have a cell wall, which determines the peculiarities of chemotherapy for diseases caused by mycoplasmas. Mycoplasmas multiply on the cell surface and in the intercellular spaces, they are capable of long-term persistence, including in the intracellular space. A person can host 16 types of mycoplasmas, 4 of them are of clinical importance, including M. pneumoniae, which has the greatest pathogenicity and causes respiratory mycoplasmosis. [3]

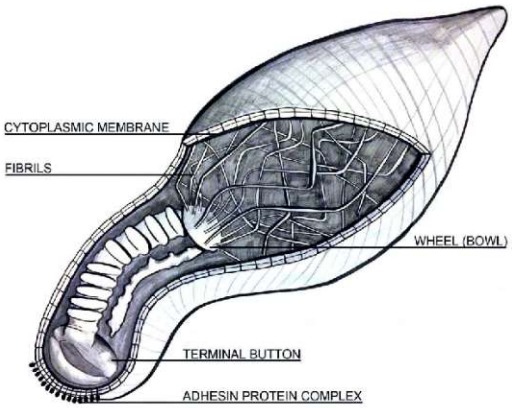

Figure 1 is a diagram depicting the cellular architecture of Mycoplasma pneumoniae.

The main manifestations of M. pneumoniae infection are fever and cough, with a moderate to high fever often observed. Some children may experience fever, accompanied by symptoms such as chills, headaches, pain and chest tightness; others may experience wheezing, and in severe cases, shortness of breath and difficulty breathing may occur. The cough characteristic of M. pneumoniae is relatively severe, often manifested by a paroxysmal dry cough in the early stages and may be accompanied by sputum release in later stages. The color of sputum is usually white and sticky, in some cases it is yellow, and sometimes with an admixture of blood. The cough gradually worsens, and some children may develop symptoms similar to whooping cough, while the course of the disease lasts 2 weeks or longer.

According to X-ray examination of the chest organs in two projections, mycoplasma pneumonia is most characterized by bilateral lung damage (86% of cases), while the volume of the lesion is most often segmental (44% of cases) or polysegmental in nature (49% of cases). Clinically, mycoplasma pneumonia differs from the typical one: a more prolonged course (73.54%), prolonged retention of an unproductive cough (75.71%), segmental or polysegmental lung lesion (49%). [4]

Mycoplasma pneumoniae is also associated with other respiratory diseases, such as lung abscess and pleural empyema, organizing pneumonia, bronchiectasis, etc. In addition, M. pneumoniae infection has been reported to be associated with exacerbation of bronchial asthma. In addition to the respiratory tract, M. pneumoniae can cause damage to the cardiovascular and hepatobiliary systems, the musculoskeletal system, accompanied by neurological, dermatological manifestations and autoimmune hemolytic anemia. [19]

Mycoplasmas avoid direct collision with the immune system and stay inside lung cells for a long time and multiply. As a result, people infected with mycoplasma often suffer from the disease asymptomatically, or with a non-specific clinic, such as fatigue, sore throat, moderate fever, dry cough. All these signs are not typical for bacterial pneumonia, hence the name "atypical pneumonia".

Pneumonic mycoplasmas have an affinity for epithelial cells lining the mucous membranes of the entire respiratory system, which allows the microorganism to infect any of its departments,

causing an infiltrative inflammatory process. [5] Due to its special convex terminal structure, mycoplasma has a unique sliding mobility and adsorption to the surface structures of host cells, in particular erythrocytes, cells of the ciliated epithelium of the trachea, bronchi, in which the biosynthesis of RNA and protein is disrupted by the toxic factor M.pneumoniae, which leads to cell death. The structural similarity of human cell membranes and mycoplasma membranes leads to the "masking" of mycoplasma antigens, weak recognition of them as foreign agents.

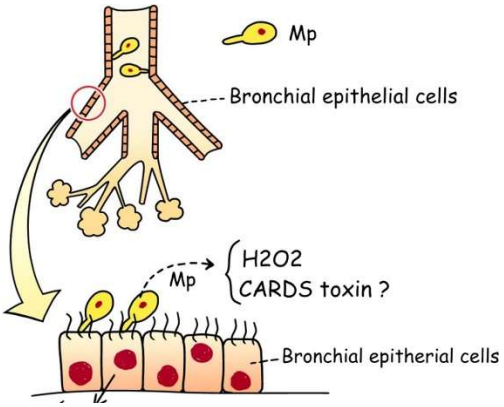

Fig.2 Penetration of mycoplasmas into bronchial epithelial cells

Attaching to the cells of the respiratory epithelium, M.pneumoniae causes dysfunction of the cilia, up to cytolysis, after which the cytoadsorption of the microorganism occurs and the incorporation of sections of the pathogen membrane into the cell membrane. (Fig.2) This leads to the fact that the mycoplasma provides itself with all the necessary nutrients. [6]

The production of a superoxidant by mycoplasma contributes to the death of epithelial cells of the respiratory tract, which causes inflammation both in the bronchi and in adjacent tissues. When the process spreads, the alveoli are affected, and their walls are compacted at the same time. After ingestion, mycoplasma attaches to the ciliated respiratory epithelial cells of the respiratory tract using a special organelle that has an adhesive protein complex called "adhesion protein P1" at its end. (Figure 3).

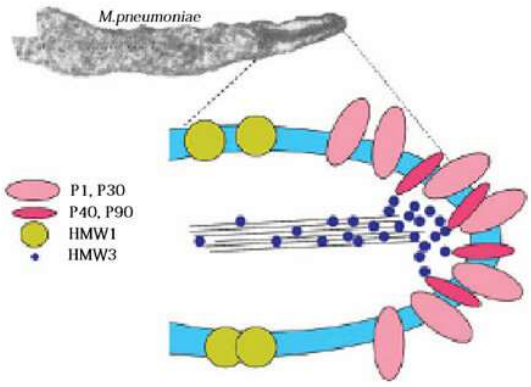

Fig.3 Structure of Mycoplasma pneumoniae adhesion protein. The adhesion protein of M. pneumoniae includes key proteins P1 and P30, proteins associated with adhesion factor, P40, P90, HMW 1 and HMW 3. These components together form a characteristic "adhesive protein complex" with a high electron density. This complex stabilizes the integrity of the structure of the apical organ of M. pneumoniae, forming a cytoskeleton that attaches the P1 protein to the cytoskeleton of adhesive organs and allows P1 proteins accumulating in the organs of adhesive cells to attach. The drawing is taken from Rotten S, 2003

The attachment of M. pneumoniae to epithelial cells of the respiratory tract is mediated by the presence of a complex of adhesives – HMW1, HMW2, HMW3, P90, P40 and P30, the main of which is the P1 protein. One of the pathogenicity factors of the CARDS microorganism, toxin (communityacquired respiratory distress syndrome toxin), causes nuclear fragmentation and stimulates the production of pro-inflammatory cytokines and an acute cellular inflammatory reaction, causing damage to the respiratory tract [10,11,12]. A number of studies have shown that the inflammatory response of the body begins after attachment of M.pneumoniae resistance to receptors (Toll-like receptors b1, b2, b6) of the ciliated epithelium and further development of the cytopathic effect due to hydrogen peroxide and superoxide radicals. However, immunologically mediated lung damage plays a crucial role in the pathogenesis of mycoplasma community-acquired pneumonia [12,13]. It is worth noting that M. pneumoniae also has proteins with the properties of superantigens that non-specifically stimulate the hyperproduction of T and B lymphocytes. In addition, T lymphocytes themselves may play a critical role in acute lung damage of M. pneumoniae. The conducted studies have shown a less severe course of pneumonia and better survival in case of insufficiency or depression of T-lymphocytes in the body. The severe course is associated with an imbalance of cytokines, proteins, and hyperproduction of superoxides that contribute to an uncontrolled inflammatory reaction. [14]

The adhesion protein P1 attaches to the surface of the host cell, for example, to the cell of the respiratory tract and holds on tightly to it. This significantly complicates the purification of the respiratory tract from bacteria using mucociliary clearance, which normally removes these foreign substances. Thus, mycoplasma multiplies and damages the cells of the respiratory epithelium. When the bacteria reach the lungs, a local inflammatory reaction is triggered and the lung tissue is filled with leukocytes, proteins, fluid and even red blood cells if a capillary is involved in this process, which leads to a local cytotoxic effect.[7]

One of the first signs of cell damage is the loss of mobility of the cilia of the epithelium. Mycoplasmas, destroying terminal bridges between epithelial cells, disorganize tissue architectonics and, spreading intracanalicularly, affect alveolocytes. It is possible to detect the pathogen in alveolocytes both by immunoluminescent analysis and by historadioautographic analysis. Mycoplasma microcolonies are found in the cytoplasm of alveolocytes, which as a result undergo a number of characteristic morphological changes leading to their death. Subsequently, M.pneumoniae enters the regional lymph nodes from the lungs, then into the bloodstream, resulting in a generalized infection with damage to internal organs and the central nervous system. Similar forms of the disease are more common in young children. In addition to the lesion of alveolocytes and bronchial epithelium, a pronounced immunomorphological reaction is observed in the lungs, characterized by thickening and infiltration of the interalveolar septa by lymphoid and histiocytic elements, the appearance of plasma cells in them, hyperplasia and plasma cell reaction in peribronchial lymphatic follicles and nodes. In addition, M.pneumoniae is capable of self-replication and, as a result, long-term persistence.[6]

The source of mycoplasma infection is patients and carriers. An infected person releases the virus when talking, sneezing or coughing. The pathogen is relatively unstable in the external environment, it collapses when heated to 40 ° C for 20 minutes. The mechanism of infection transmission is aerogenic. The incubation period lasts from 1 to 4 weeks (on average 2-3 weeks). The virulence of infection in boys is higher than in girls, but less compared to infectious diseases such as measles, whooping cough, chickenpox, rubella and influenza [6,8,9]. Figure 4 shows a histological preparation of a lung infected with mycoplasma pneumonia.

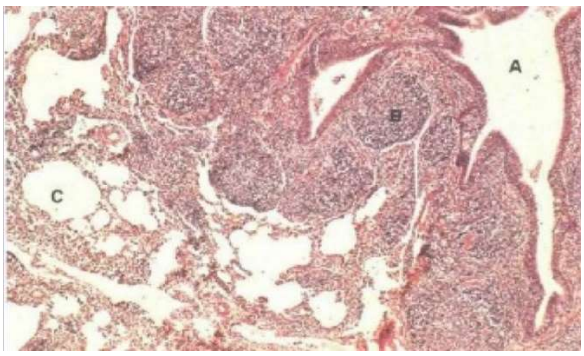

Fig. 4. Mycoplasma pneumonia: histological preparation of the lung (stained with hematoxylin and eosin)
Bronchioles are surrounded by numerous infiltrates from lymphocytes forming follicles (A-bronchus, B-follicle, C-alveoli)

On November 23, 2023, The Lancet published the report "Mycoplasma pneumoniae: Delayed reappearance after restrictions were imposed due to the COVID-19 pandemic." The report illustrated the emerging trend in the spread of Mycoplasma pneumoniae infection, data on the prospects for surveillance of which were obtained from 45 locations in 24 countries from four UN regions: Europe, Asia, North and South America. According to the report, over the past 6 months, there has been an increase in PCR tests for Mycoplasma pneumoniae infection in these regions compared to previous testing periods since the start of prospective surveillance [M. pneumoniae was detected by PCR in 1067 (0.71%) of 149,980 tests over 6 months]. [22]. According to data obtained in Beijing, with the beginning of the school season, the incidence rate began to rise immediately after a slight decrease in August. During this epidemic, the frequency of positive detection (using real-time PCR analysis) is M. pneumoniae in outpatient patients can reach 25.4%, in inpatient patients - 48.4%, and in patients with respiratory diseases - 61.1% [23]

The recently published 2023 edition of the National Health Commission's “Guidelines for the Diagnosis and Treatment of Mycoplasma pneumoniae in Children” recommends doxycycline as an alternative drug for the treatment of MP in children. Macrolides are generally considered first-line antibiotics in the treatment of M. pneumoniae infections and are still used in China as antibiotics for the treatment of MP in children. Macrolides inhibit bacterial growth by binding to 23S rRNA and inhibiting protein synthesis. However, overuse of macrolides may eventually lead to the emergence of macrolide-resistant strains of M. pneumoniae. Since 2000, macrolide resistance (MRMP) has been widespread in Asian countries, with the number of cases growing rapidly, accounting for approximately 80-90% of MP cases in China and Japan.
Many hospitals have noted that the current outbreak of M. pneumoniae infection is mainly caused by MRMP. The frequency of mutations of macrolide-resistant genes in 23S rRNA in Beijing reaches 97.1%, which is significantly higher than previously reported (about 90%). MRMP is often manifested by high fever, severe cough and poor mental health, which leads to a prolonged course of the disease, prolonged hospital stay and poor prognosis. [16]

Thus, it is necessary to conclude that the issue of studying community-acquired pneumonia remains relevant in modern medicine. Acute respiratory infections are a huge problem because they occupy a leading position and remain one of the main causes of morbidity, hospitalization and mortality. The incidence of mycoplasma pneumonia is significantly more common in school—age children (86.37% of cases), less common in preschool children (13.65% of cases) and practically not typical for infants and infants (2.47%) [4]. It should be borne in mind that epidemic outbreaks of mycoplasma infection are recorded every 3-7 years, and it is during this period that the proportion of respiratory mycoplasmosis can reach 30-40%. Thus, it is necessary to study the occurrence and specific regulatory mechanism involved in the immuno-inflammatory response to

M. pneumoniae; the results obtained may contribute to the early detection and targeted treatment of MP in children [17]. Pneumonia in children caused by M.pneumoniae has clinical, radiological and laboratory features and requires special attention and control so that the disease does not spread throughout the body. Mycoplasmas can inhibit local immunity, which contributes to the attachment of other bacterial infections. The likelihood of inflammation of the paranasal sinuses, middle ear or urinary tract increases, and there is also a risk of stenosis (narrowing) of the larynx, trachea or bronchi, which may cause respiratory failure. A weakened immune system has a reduced ability to fight pathogens, which leads to a higher risk of infection and potentially more severe diseases.

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Chemical Sciences

Metrological certification of standard samples for the content of titanium ions according to the preparation procedure

Mergenova Zhansaya Markhabatkyzy
2nd year master's student at East Kazakhstan University named after Sarsen Amanzholov
Mukazhanova Zhazira Bigalievna
Doctor of Philosophy, East Kazakhstan University named after Sarsen Amanzholov

Abstract:
This study focuses on the metrological certification of standard samples containing ions of titanium through a specific preparation procedure. The accurate determination of these ions is crucial in various industrial and scientific applications. The methodology involves rigorous preparation techniques to ensure the reliability and traceability of measurements . Through meticulous calibration and validation processes, the concentrations of titanium ions are accurately quantified, enhancing the quality and trustworthiness of analytical results. This research contributes to the advancement of metrology in elemental analysis, enabling precise measurements vital for quality control and research endeavors.

Standard samples are necessary to ensure uniformity of units of measurement. Depending on the metrological status, it can be used in one region or in a region outside of legal metrology, depending on approval. Depending on the approval, standard models are divided into several categories: state standard models, interstate standard models, industry standard models, enterprise standard models, COOMET standard models.[1] Depending on their metrological status, they are divided into reference materials, certified reference materials and reference materials. Certified standard models have common features, established homogeneity, established stability, established certified value, indication of the uncertainty or error of the certified value, established metrological control, established interchangeability, and the presence of a standard sample certificate.[2] The certified model must be metrologically controlled in accordance with the International System of Units or International Standards of Units or other standards. Certified Standard Models:
- checking, calibration, metrological certification of measuring instruments, measuring systems;
- in order to assess the compliance of measuring instruments with established requirements, carrying out measurements, including approval of samples;
- validation and certification of measurement techniques (methods);
- assessment of the reliability of measurement methods (methods), verification of measuring instruments, calibration methods;
- control of correctness, assessment of deviations of measurement and test results;
- description of standard models, materials;
- certification and control of testing equipment;
- it is necessary to confirm the degree of equivalence of the measurement results of two or more laboratories.

Metrological characteristics are described in the technical documentation for the production of certified reference materials as follows:
- certified description (certified parameter);
- permissible range of certified values;
- target uncertainty and/or permissible value of error in characterizing the certified value;
- target uncertainty and acceptable value of error description heterogeneity;
- target uncertainty of error description and acceptable instability value.
In general, the development of standard models includes the following stages:
- Formation of technical specifications for development;
- Development of documentation, labeling, packaging of standard models.
- Development of a program for determining the metrological characteristics of reference materials, including a characterization method, a method for determining uniformity and a method for determining stability;
- Carrying out research and experimental work on the preparation of standard samples;
- Establishment of metrological characteristics of the released batch.
The approval and registration of standard models is accompanied by the issuance of a type approval document and a type description of the standard model.
If the errors associated with reference material development technology, error caused by heterogeneity, error caused by instability, error of starting materials can be assessed, then reference materials can be developed according to the preparation procedure. According to the preparation process, the certified value of the reference material and the uncertainty of the certified value are evaluated.[3]
Standard samples of the composition of titanium ion solutions are intended for verification and calibration of measuring instruments, metrological certification of measurement methods, control of accuracy indicators, preparation of certified mixtures and other types of metrological work.[4]
The main areas of application of standard models are geology, metallurgy, environmental protection, and healthcare.
The material of standard samples is prepared by dissolving pure metals (substances) and their salts in mineral acids, and then diluting them with a solution of nitric acid with a molar concentration of 1 mol/dm3 or water. This procedure for preparing solutions allows for an appropriate assessment of their metrological characteristics.
The standard model certification method based on production technology is based on the use of known and specially studied characteristics of starting materials and substances.
Pure metal (working numbers CO-20) was used as the starting material to create a standard sample.
The starting materials are presented in Table 1.

Table 1 – Initial materials of standard samples

CO number	Main substance	Mass fraction of the main substance, %	Metal grade, substance qualification	Regulatory document
CO -20	Titanium powder	99.9 9	F-325	GOST 17746-96

To prepare a standard material sample, the following measuring instruments and reagents are required:
Laboratory scales of special accuracy class according to GOST 24104;
Volumetric flasks of the 2nd class, wiped with a stopper in accordance with GOST 1770;
Pipettes class 2 according to GOST 29169, GOST 29228;

Chemical glasses according to MEMST 25336;
Nitric acid according to GOST 11125, central nervous system;
Distilled water according to GOST 6709, deionized , water resistivity (not less than 18.2 MOhm*cm);
Dispenser pipettes according to TU 9452-002-33189998-2002.
According to the specifications, open type muffle furnace 3442.002.24662585-01.
Standard samples are a one-component solution of titanium ions in a nitric acid solution with a concentration of 1 mg/cm3. Standard samples are prepared at an ambient temperature of 20 ± 1 °C.
The preparation of standard sample material is based on dissolving the metal or its salt in water or dilute (concentrated) acid and water. The solution is transferred to a flask with a nominal volume of 1000 cm3 at ambient temperature (20±1) ºC and brought to the mark with deionized water. The cooking process is shown in Table 2.

Table 2- Procedure for preparing standard samples of materials

CO number	Sample weight, g	Solvent	Ratio of acid and water for dissolution	Solvent volume, cm ^{3}	Molar concentration, mol/dm ^{3}
CO -20	0.1005	HNO3	1:2	88.2	1.0

The algorithm for metrological certification of reference materials is based on the calculation of the mass concentration of metal ions and the error of the certified value. The quality of the resulting reagents and solvents is assessed.
As a certification method, a computational and experimental procedure for preparing a standard sample was implemented. The following metrological characteristics were assessed using this procedure:
- certified value of the standard sample;
- error (uncertainty) of the certified value of the standard sample;
- stability (shelf life) of the standard sample.

The certified value A of the mass concentration of titanium ions in a standard sample is calculated using the formula:

$$A = \frac{\mu \times m}{100 \times V}, \quad (1)$$

where μ is the mass fraction of the main substance in the starting material, %;
m is the mass of a sample of the starting substance, mg;
V - dilution volume (nominal capacity of the flask), cm ^{3} :
2.3 The value of the error characteristic of the certified value of the standard sample is calculated using the formula:

$$\Delta_a = \sqrt{\Delta_м^2 + \Delta_n^2}, \quad (2)$$

where Δ_m is the error characteristic associated with establishing the composition of the standard sample based on the source material;
Δn – error characteristic due to the standard sample preparation procedure.

The error characteristics Δ_m for each standard sample are estimated in accordance with the formula:

$$\Delta_m = \frac{\Delta_\mu \times 100}{\mu}, \quad (3)$$

where Δμ - the limiting value of the possible deviation of the mass fraction of the main substance from 100%, %;
μ – mass fraction of the main substance, %.
The relative error due to the standard sample preparation procedure is calculated using the formula

$$\Delta_n = \sqrt{\left(\frac{\Delta_m \times 100}{m}\right)^2 + \left(\frac{\Delta V_к \times 100}{V_к}\right)^2}, \quad (4)$$

where Δ_m – weighing error, g;
m – mass of sample for preparing CO, g;
$\Delta V_к$ – value of the error of the volume of the flask, cm^3;
V_c – nominal capacity of the flask (dilution volume), cm^3.

The established metrological characteristics of the RM are presented in Table 3:

Table 3 – Metrological characteristics of RM

CO number	Element	Dilution volume	Certified CO value, mg /cm^3	Actual value of the relative error of the certified value of RM (P=0.95), %
SO-20	Titanium	1000	1,000	0.5

In conclusion, the metrological certification of standard samples for the content of titanium ions according to the preparation procedure is a critical aspect of ensuring the accuracy and reliability of analytical measurements in various fields. Through our research, we have highlighted the significance of meticulously following standardized preparation procedures to guarantee the consistency and reproducibility of certified standard samples.
Our study has provided valuable insights into the complexities involved in the certification process, particularly focusing on the determination of titanium ion content. By elucidating the intricacies of sample preparation and its impact on certification outcomes, we have contributed to the advancement of metrological standards in analytical chemistry.
Moving forward, it is imperative to continue refining and standardizing the preparation procedures for certified standard samples to meet the evolving demands of analytical science. By maintaining a steadfast commitment to accuracy and precision, we can further enhance the reliability and trustworthiness of analytical measurements, thereby advancing scientific research and technological innovation.
We hope that our findings will serve as a valuable resource for researchers, practitioners, and regulatory bodies involved in metrological certification and analytical chemistry. Through

continued collaboration and dedication to excellence, we can foster a culture of quality assurance and ensure the integrity of analytical measurements in diverse applications.
In closing, we extend our gratitude to all those who have contributed to this research endeavor and express our optimism for the continued advancement of metrological certification practices in the field of analytical chemistry.

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THE SYNTHESIS OF MODIFIED EPOXY RESINS

Dr. Irade Abdullayeva Gurban
Associate Professor, Azerbaijan State Oil and Industry University
Elsevar Safarov Ziya
Azerbaijan State Oil and Industry University
Guntaj Samadova Rahman
Azerbaijan State Oil and Industry University

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Modern construction relies heavily on polymer compositions based on epoxy resins. Epoxy oligomers are widely used in the production of adhesives. Adhesive compositions mainly utilize epoxy resins branded as ED-8, ED-24, ED-24N, ED-20, ED-22, ED-16, and so on. Depending on their molecular weights, they can be liquid or solid.

Some Japanese researchers have reported conducting studies on the synthesis of bio-based epoxy resins since the 1960s using wood biomass. Plant oils (such as soybean oil, linseed oil, and palm oil), tannins, rosins, bark, processed biomass, and lignin have been used as precursors in the synthesis of epoxy resin. The main advantage of these types of epoxy resins is their biological degradation capability. Among these bio-based epoxy resins, plant oil-based epoxy resins lead to weak heat resistance due to their non-aromatic chain structure, leading to the formation of mechanical and other performance characteristics, limiting their industrial applications. Therefore, in some industrial sectors, they were only used as plasticizers and modifying agents. For example, the addition of epoxidized soybean oil to petroleum-based bisphenol A epoxy with the isophorone-diamine system effectively reduces the maximum curing temperature and improves the water absorption and chemical resistance properties of the resulting epoxy resins [1-3]. Bio-based nanocomposites have been produced from bisphenol F diglycidyl ether (BFDGE) of montmorillonite clay, epoxidized linseed oil, and methyl tetrahydrophthalic anhydride. These new bio-based nanocomposites possess high elasticity modulus, glass transition temperature, and fracture toughness, making them potentially applicable in various industrial sectors. A new bio-based epoxy resin with double bond networks stabilized by itaconic anhydride has been prepared. Divinylbenzene and acrylate-epoxidized soybean oil were incorporated into the cured resin to enhance its final properties, demonstrating that its glass transition temperature, impact strength, flexural strength, and flexural modulus can be compared to conventional resin [3-7]. Dimer acid (the dimer of unsaturated C_{18} fatty acid) is another biologically derived material used in epoxy resin systems. Like plant oil-based epoxy resins, dimer acid-based epoxy resin also exhibits weak mechanical, dielectric, and thermal properties due to its non-aromatic structure and long side chains. As previously discussed, lignin is a naturally occurring polydisperse phenolic polymer. The presence of phenolic hydroxyl groups in lignin allows it to be used in the synthesis of various polymers, such as phenolic resins, epoxy resins, polyurethanes, and polyethers [7-11]. It is expected that lignin-based epoxy resins may possess similar properties to conventional petroleum-based epoxy resins. Lignin-based epoxy resins can be produced through three different methods [12,13].

1. Physical blending of lignin with petroleum-based epoxy resins.
2. Pre-stabilization of lignin to improve its reactivity, followed by epoxidation of modified lignin with epoxides.
3. Direct epoxidation of lignin with epoxides

In the first method, lignin is physically blended with petroleum-based epoxy resin and stabilizer to prepare composite materials. After drying, lignin will react with the epoxy resin. The obtained lignin-epoxy composites exhibit good compatibility with other materials after drying at high temperatures, as well as excellent mechanical and dielectric properties. In research, low molecular weight kraft lignin was mixed with 1,3-glycerol diglycidyl ether (epoxy resin) and imidazole (hardener) to obtain bio-based epoxy resin. The composition of the composites varied between 20-50%, and the best thermoreactive material had an impact strength of 37 MPa and a Young's modulus of 2.2 GPa. In some studies, lignin has been used as a hardener for epoxy resins [14-18]. Reinforced green composites have been prepared by blending lignin (as a hardener) with DGEBA at concentrations ranging from 15% to 30% in the composition, and the effect of lignin content on the thermal and mechanical properties of the composites has been investigated and compared with an epoxy resin system treated with isophorone diamine. Optimal properties were obtained from a system containing 25% lignin. Pan and others used aminolyzed lignin as a treatment agent for epoxy resin, where aminolyzed lignin was synthesized via a two-stage process using glyoxal lignin. Initially, glyoxal lignin was dissolved in sodium hydroxide solution, then epichlorohydrin was added, and the mixture was stirred at 50°C for 8 hours to epoxidize the lignin. Subsequently, to prepare aminolyzed lignin, epoxidized lignin was reacted with propane diamine at 80°C for 4-6 hours. It was determined that aminolyzed lignin is a more reactive cross-linking agent for epoxy resins due to its primary and secondary amine groups, resulting in epoxy resin with a homogeneous and stable structure [18,19,20,21].

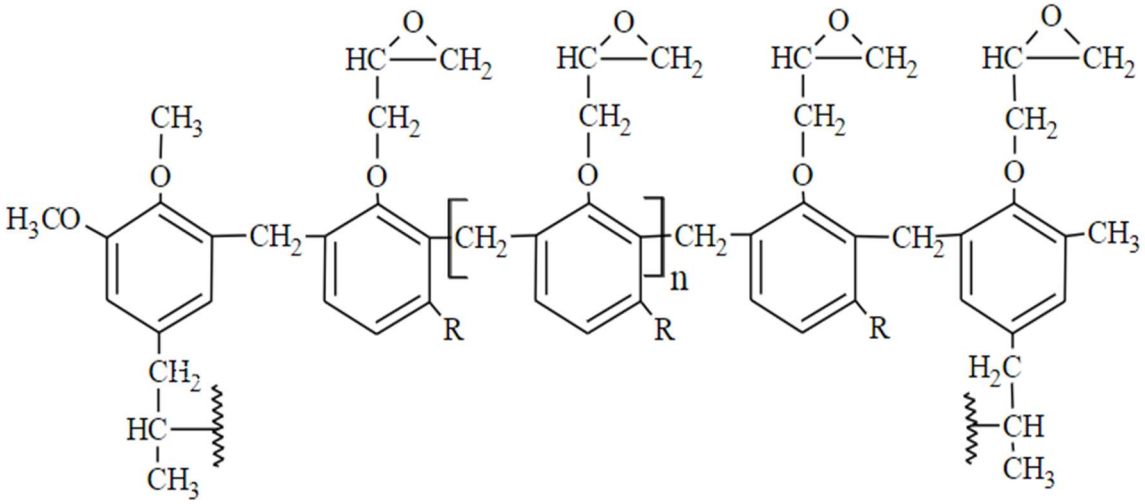
Indeed, the limitation of the simple blending method is that lignin can only replace a small percentage (<20-30 mass fraction) of epoxy resins. In contrast, through the second and third methods, it is possible to completely replace petroleum-based materials (such as epoxy resins) with lignin-based materials [22].

In one study, kraft lignin initially underwent reactions with unsaturated carbonyl groups or unsaturated nitrogen-containing compounds, resulting in alpha or beta-unsaturated reactive end groups in the lignin molecule. These unsaturated groups were then epoxidized via reaction pathways involving hydrogen peroxide or sodium peroxide. Several studies have been conducted on the epoxidation of lignin after pre-stabilization. Sulfate or chloride salts and phenolic initiators were used to break the intermolecular bonds of kraft lignin molecules to increase the phenolic hydroxyl groups in lignin molecules, followed by the reaction of lignin molecules with epichlorohydrin under sodium hydroxide conditions [23]. For the same purpose, ozonolysis of kraft lignin was achieved by dissolving lignin in a dioxane/water mixture, followed by oxidation with oxygen containing ozone. This oxidative stabilization breaks down the aromatic ring of lignin and can generate muconic acid derivatives with carboxyl groups at both ends of the coupled double bond. Then, ozonated lignin was dissolved in glyoxal solution to create cross-linking interactions with water-soluble petroleum-based epoxy resins. The cross-linked product possesses a network structure capable of penetrating intermolecularly into wood substrates, providing excellent adhesion. In another modification, lignin was dissolved in ethylene glycol at 80°C and reacted with succinic anhydride and dimethylbenzylamine for 6 hours [24-26]. The mixture obtained from the ether-carbonization of alcohol lignin and ethylene glycol was reacted with ethylene glycol diglycidyl ether at 130°C for 5 hours to synthesize lignin-based epoxy resin. Hofmann and others have prepared epoxy resins from hydroxyalkyl lignin derivatives obtained from organosolv lignin, which have different degrees of alkoxylation. In the study by Hofmann and

others, the alkoxylation of organosolv lignin was improved by reacting it with propylene oxide to enhance its solubility, followed by the conversion of secondary hydroxyl groups to primary hydroxyl groups with ethylene oxide, and then the epoxidation of pre-treated lignin with epichlorohydrin. The average molecular weight of the epoxidized lignins ranged from 1000 to 30000, and the epoxide index ranged from 200 to 700 eq/kg. The epoxidized lignin was cross-linked with meta-phenylenediamine, and then its mechanical properties were evaluated [27-29]. The epoxy-amine network with more than 50% lignin content exhibited similar strength and modulus properties to conventional DGEBA-amine networks in a sequential manner [30].

Simionescu and others modified anhydrosulfite with phenol, beta-naphthol, bisphenol A, and novolak phenol-formaldehyde resin through phenolization reactions. Then, these phenolic products were reacted with epichlorohydrin under alkaline conditions (NaOH) at 75°C for 6 hours. Lignin-epoxy resin with good thermal stability was obtained by the epoxidation of phenolic intermediate products with epichlorohydrin, obtaining various fractions of liquid and solid at different molar ratios [31]. Zhao and others synthesized epoxy lignin resins from calcium lignosulfonate. The initial stabilization of calcium lignosulfonate involved the use of sulfate to convert lignosulfonate into phenolated lignosulfonate at temperatures exceeding 95°C for 3 hours. Through this modification, the composition of phenolic hydroxyl groups was improved, and phenolated lignosulfonate was subsequently epoxidized with epichlorohydrin with the participation of sodium hydroxide as a catalyst. An interesting aspect of the described method for synthesizing epoxy lignin is the simultaneous production of two types of epoxy resins (solid phase and liquid phase). C-NMR spectroscopic analysis revealed the presence of new peaks ranging from 40 to 80 ppm in the structure of both solid and liquid epoxy resins, indicating the presence of epoxy groups [32,33].

Huo and others synthesized lignin-cardanol novolac epoxy resin. Cardanol was treated with sulfuric acid at 150°C for 3 hours, cooled to 90°C, and then reacted with lignin, chloride salt, and aqueous formaldehyde solution for 3 hours. The obtained product was washed and dried with a NaOH solution, then reacted with epichlorohydrin at 70°C for 4 hours in the presence of benzyltriethylammonium chloride. Eight times the stoichiometric amount of NaOH solution was added, and the reaction was maintained at a constant temperature for 4 hours. Finally, a viscous lignin-cardanol novolac epoxy resin was obtained. The structure of the mentioned compound is provided below [34].



As reported by Simionescu and others, calcium lignosulfonate directly reacted with epichlorohydrin under alkaline conditions at 70-75°C for 4.5-7.5 hours, using various sodium hydroxide solutions and different molar ratios of epichlorohydrin (ranging from 100 to 212). The use of high-concentration sodium hydroxide and low molar ratios of epichlorohydrin resulted in the formation of a prepolymer with high solubility and a high epoxy equivalent. Although the

crosslinking of lignin-based epoxy resin with diaminodiphenylmethane is slower than that of conventional petroleum-based epoxy systems, it has been found that the tensile strength of bio-based epoxy films can be comparable to that of conventional epoxy resin films. Hirose and others synthesized epoxy prepolymers from lignin and lignin-related phenols such as p-hydroquinone and methoxy-p-hydroquinone via reaction with epichlorohydrin in a NaOH aqueous solution at 100°C for 5 hours. The synthesized epoxy resins were then cured with polyazelaic anhydride [35]. Delmas and others utilized lignin as a substitute for bisphenol-A in the synthesis of epoxy resin. The epoxidation reaction was carried out by dispersing lignin in water with the participation of an Ultra-Turrax T18 disperser (IKA, Staufen, Germany). Subsequently, the pH of the system was raised to approximately 12 using aqueous NaOH. Finally, poly(ethylene glycol) diglycidyl ether was added as the epoxy agent, and the mixture was heated to 60°C and maintained at this temperature for 2 hours. The chemical composition of the lignin-based epoxy resin was analyzed by solid-state 13C NMR spectroscopy. In another study, esterification of lignin was achieved by reacting it with epichlorohydrin at 100°C for 2.5 hours, using sodium hydroxide at a 10-fold excess in two stages [36].

Malution and others modified lignin through hydroxymethylation (reaction with formaldehyde in an alkaline environment) before epoxylation. The epoxylation process was conducted on both unmodified lignin and hydroxymethylated lignin. The effects of reaction temperature, reaction time, epichlorohydrin/lignin molar ratio, and NaOH/lignin molar ratio on the reaction parameters were investigated. The results showed that increasing temperature and reaction time negatively affected the epoxy index of the product due to cross-linking reactions. Additionally, epoxy resins produced from the modified lignin (hydroxymethylated lignin) exhibited lower epoxy indices compared to those produced from unmodified lignin. Masuri and others improved the applicability of kraft lignin by epoxylation. Before epoxylation, kraft lignin underwent two different modifications. The first modification involved the methylation of kraft lignin via reaction with formaldehyde, while the second involved the oxalation of kraft lignin to form quioxals. Subsequently, epoxylation was performed on unmodified kraft lignin, methylolated kraft lignin, and quioxalated kraft lignin. H-NMR results showed that methylolated kraft lignin had more aliphatic hydroxyl groups compared to unmodified kraft lignin and quioxalated kraft lignin. Therefore, the methylolated lignin with a higher hydroxyl group content can be a more beneficial material, especially for producing resins such as epoxy resins. Their results indicated that the optimal conditions for the synthesis of lignin-based epoxy resin were achieved with a lignin/NaOH ratio of 1/3 (by weight) at a temperature of 70°C for 3 hours [37-40].

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MODIFIED ANILINE-FORMALDEHYDE OLIGOMER

Dr. Irade Abdullayeva Gurban
Associate Professor, Azerbaijan State Oil and Industry University
Guntaj Samadova Rahman
Azerbaijan State Oil and Industry University
Elsevar Safarov Ziya
Azerbaijan State Oil and Industry University

Summary- The article provides information on the synthesis of modified multifunctional aniline-formaldehyde oligomers, as well as research results on their modification with various substances and characteristics. Aniline-formaldehyde oligomers are obtained from aniline and formaldehyde, mainly in the presence of an acid catalyst. These modified oligomers possess improved mechanical, thermal, and chemical properties and can be used in applications such as metal-coated laminates, electronic materials components, adhesives, etc. These oligomers exhibit good inhibitor properties. The progress of reactions such as tar-forming reactions and the condensation reactions of aniline and formaldehyde depends heavily on the reaction stoichiometry, pH, and experimental conditions such as temperature. Furthermore, the condensation reactions of aniline and formaldehyde can be classified firstly as reactions producing high molecular weight tar in the presence of acid catalysts and secondly as reactions producing lower molecular weight bases in the absence of acid catalysts. The structures, properties, and application areas of obtained tars vary depending on initial raw materials and the method of acquisition.
Keywords- aniline, formaldehyde, modification, oligomer, modifier

Formaldehyde resins are the most widely used polymers produced as a result of reactions between formaldehyde and phenols, bisphenols, xylene, aniline, melamine, resorcinol, etc. Depending on their composition, these resins can vary from low viscosity free-flowing liquids to solid materials. As examples of the incompatible aspects of financially viable formaldehyde resins, we can mainly point out their low molecular weight and their susceptibility to easily deteriorate as rigid thermoplastic materials. Therefore, they cannot be used alone but can be employed in the coating industry by blending them with other polymer materials. Apart from coatings, we can note that lacquers, paints, textiles, as well as the paper sector, are the most important application areas. One of the formaldehyde resins is aniline formaldehyde. The OH and NH_2 groups in the polymer chain allow for the modification of these resins through epoxidation or the addition of other components [1].

The synthesis of 4,4-methylenedianiline (MDA) from aniline and formaldehyde is considered a complex reaction. The main thermodynamic properties of the substances involved in the reaction have been calculated using various methods. The enthalpy, Gibbs free energy change, and equilibrium constant of the main reactions have been determined. The effect of reaction temperature and the ratio of aniline to formaldehyde on the reaction equilibrium has been investigated through thermodynamic simulations and confirmed by experimental data comparison. It has been shown that higher reaction temperature prevents the formation of additional products, thus leading to higher yields of MDA. The optimized molar ratio of aniline to formaldehyde is 3:1. Under these reaction conditions, fewer by-products are formed, and the subsequent separation of aniline is easier.

In the current production process of MDA, aniline and formaldehyde are used as raw materials, and chloride catalysts are employed to catalyze the reaction, which proceeds via homogeneous catalysis. Despite the advantages of this method, such as gentle reaction conditions, a straightforward synthesis route, and readily available raw materials, there are also drawbacks, such as the generation of large amounts of wastewater and the occurrence of significant side reactions.

By utilizing benign chlorides as reaction catalysts, research into new clean processes and significant advancements have been achieved.

Both aniline and formaldehyde form relatively active groups, resulting in the formation of various by-products during the MDA synthesis reaction. This complicates the reaction system for the production of MDA from aniline and formaldehyde. Therefore, optimizing the reaction conditions and producing 4,4-MDA products in a targeted manner are at the forefront of research efforts [2-6].

The main intermediate in the industrial synthesis of polyurethane, 4,4-methylene diphenyl diamine (4,4-MDA), is a reaction product of aniline and formaldehyde, which is widely applied. Various methods can be proposed to prevent side reactions during the molecular synthesis of 4,4-MDA to ensure its production according to molecular theory. Therefore, a molecular mechanism consisting of eight sequential main reaction steps from aniline and formaldehyde in an acidic environment to the production of 4,4-MDA is proposed using the accurate G3MP2B3 composite quantum chemical method. Subsequently, the results of G3MP2B3-SMD calculations for anhydrous aniline derivatives are compared with the gas-phase mechanism. Based on gas-phase calculations, the standard enthalpy of reaction, entropy, and heat capacity values are evaluated using the G3MP2B3 results for intermediates. In the proposed mechanism, the main side reactions are considered: protonated p-aminobenzyl aniline (PABAH+), protonated amine (AMH^+), and o-aminobenzyl aniline (OABAH+) are formed. The reciprocal reactions for the formation of 4,4-MDA, such as 2,4-MDAH+ and 3,4-MDAH+, are also analyzed thermodynamically. AMH+ may easily undergo transition, but the occurrence of 2,4-MDA is likely to happen with a lower transition state, creating difficult conditions kinetically. The acid strength of main intermediates such as N-methylenebenzenanilium, PABAH+, 4-methylenecyclohexa-2,5-dien-1-iminium, and AMH+ is evaluated by relative calculation of pKa.

The polyurethane industry requires a large quantity of methylene diphenyl diisocyanate (MDI) as a raw material, and the global MDI market reached 6 million tons in 2016. MDI production is mainly based on methylene diphenyl diamine (MDA). MDA can also be applied as a component of epoxy resins, pigments, coatings, plastic fibers, and insulation materials, making it an important intermediate for the chemical industry.

The most widely applied synthesis of MDA in industry is the product of the reaction between aniline and formaldehyde with the participation of hydrochloric acid under mild (60-110°C) reaction conditions. In the current technology, benign chlorides, zeolites, layered materials, ion resins, or ion exchange resins are used as catalysts to prevent the use of corrosive hydrochloric acid and the formation of large quantities of salt by-products. However, none of the catalytic MDA productions have advanced beyond the laboratory stage. Although a proposed reaction mechanism for MDA synthesis has been presented, it remains incompletely understood [7-14].

Aniline-formaldehyde condensate (AFC) is a resin containing amino (-NH_2) groups, and it can be easily synthesized from aniline and formaldehyde in an acidic environment. The synthesis of polymer resins containing functional groups capable of reacting has been an active area of research in the polymer field because it is considered a convenient method for modifying polymers used in various applications. Over the past decade, nanotechnology has gained significant attention due to its potential for widespread application in various fields. When the size of many

identified and well-studied materials is scaled down to the nanoscale, their diverse and improved properties become apparent. In recent years, polymer-based nanocomposites reinforced with Na-montmorillonite nanoclay particles have attracted considerable attention. This is because such composites significantly enhance mechanical, thermal, and other properties compared to pure polymers, leading to an increase in their application areas. It is known that nanoparticles can also improve the mechanical properties of nanocomposites and their resistance to high temperatures [15].

In recent years, the textile industry has been discharging large quantities of colored wastewater, creating significant environmental problems. This wastewater prevents light from penetrating into water bodies and can have negative effects on biological processes. Furthermore, many dyes are toxic to organisms and harmful to aquatic life. Moreover, some dyes are highly carcinogenic, making the removal of dyes extremely important before discharging wastewater. Malachite green (MG) is one of the most commonly used dyes in the textile industry. Exposure to MG can have teratogenic, mutagenic, and carcinogenic effects on humans.

Various chemical and physical processes are used to remove MG dye from wastewater. Adsorption is a cost-effective and versatile process because it is a straightforward process. Polyaniline-formaldehyde (PAF) is widely used as an adsorbent for removing dyes from wastewater. It is a functional polymer with Sp^3hybridized amine groups capable of forming coordination bonds with cationic species due to the presence of an unpaired electron in nitrogen [16-20].

The aim is to improve the mechanical and thermal properties of epoxy modified with amino functional aniline-formaldehyde condensate (AFAFC) and to evaluate the optimal outcome of the modified epoxy. To achieve effective reinforcement, various compositions were prepared by adding AFAFK to epoxy at different concentrations. The impact, adhesion, hardness, and flexibility of the modified and unmodified epoxy were characterized through dynamic mechanical analysis. The thermo gravimetric analysis of the modified epoxy was also demonstrated.

The results showed that the mechanical strength significantly increased when using AFAFC for epoxy modification compared to unmodified epoxy. This is because, in the initial stage, AFAFC blends with epoxy to form a homogeneous product. This good blending aids in chemical reactions and network formation. During the curing process, as molecular weight increases, the components separate in the reaction environment and create a second dispersed phase.

Research limitations/results AFAFC as a hardening agent was synthesized using aniline and formaldehyde. Additionally, another hardening agent can be synthesized by modifying the amine and aldehyde, and the effectiveness of epoxy modification can be explored using these agents.
Originality/value AFAFC-modified epoxy can be used in the encapsulation, casting, adhesives, coating, and encapsulation of semi-conductive devices [21].

Many epoxy resins lack toughness, meaning they are not sufficient for applications requiring energy dissipation at the crack tip. Therefore, epoxy resins are often modified with rubbers, especially low molecular weight functionalized elastomers. Enhanced toughness is achieved by incorporating reactive end groups into the rubber, which form a phase boundary with epoxy groups through a chemical reaction during curing, leading to good adhesion along the phase boundary. Generally, the main requirements for toughening agents are as follows:

1. Low viscosity of toughening agents
2. Distribution of rubber particles with sizes ranging from nanometers to micrometers to prevent matrix plasticization and achieve full phase separation in the nanometer to micrometer range, forming dispersed rubber phases
3. Good interfacial adhesion between dispersed rubber phases and the epoxy matrix

Amin-terminated poly(ethylene glycol) benzoate (ABPEQB) has been prepared, forming compatible blends with epoxy resin. The prepared ABPEQB can serve as both a plasticizer and a

toughening agent for epoxy resin. During toughening, improvements in impact, adhesion, hardness, and flexibility were observed due to phase separation and the incorporation of soft elastomeric dispersed particles into the matrix, as confirmed by SEM. The main toughening mechanisms at work are the effectiveness of matrix crack arrest and cavitation of polymer particles [22-25].

When exposed to atmospheric conditions or used as coatings in bioenvironments, polymers can become soiled or contaminated by microorganisms such as bacteria and fungi. It has been observed that microorganisms can cause the attachment and swelling of protective coatings in various conditions and biomimetic applications. One possible solution to these problems is the preparation of polymers with physical-mechanical, chemical, and antimicrobial activities. Additionally, there is a growing demand for antimicrobial polymers due to hygienic living conditions. Recently, a wide range of coordination polymers exhibiting promising performance under stressful conditions has been investigated.

The synthesis of polymer resins containing reactive functional groups has been an active area of research in polymer science because it provides a versatile method for modifying polymers for desired applications. The incorporation of metal ions into polymer chains affects not only their strength but also their chemical properties and biological activities, providing applications such as coatings, textile treatments, adhesives, additives, resins, and catalysts [26-33].

These polymers are widely used in surface coatings, semipermeable devices, and nanotechnology. Metal-containing polymers also exhibit sufficient biocompatibility and biodegradability, making them superior to conventional polymers in terms of antimicrobial activity and have been utilized as biocidal coatings to prevent the development of microorganisms on surfaces.

In general, coordination polymers are not resolved in conventional solvents, but are infused or melted at high temperatures. Potential biological activity and high heat stability can generate significant interest, inspiring us to synthesize modified aniline-formaldehyde resins by adding the piperazine moiety (AFP) and its metal complexes [34-41].

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Technical Sciences

Thermal regime of enclosing structures

Shahida Yesenbekovna Shonbasova
International educational Corporation (Kazgasa campus), 2nd year master's student of the specialty "engineering systems and networks"
Scientific supervisor –
Guldana Soltanovna Abieva
Almaty city, Kazakhstan

Annotation
It is known that there is a direct relationship between the population density of cities and the cost of energy conservation, which stimulates the construction of high-rise buildings, high-rise buildings. At the same time, special attention is paid to the development of the concept of an "energy-efficient house" with increased comfort in the premises of buildings and energy savings. And this requires new solutions for thermal protection of buildings and heating, ventilation and air conditioning systems that determine their thermal regime. The main purpose of the building is to protect the people in it from the adverse effects of nature.
Keywords: thermal protection, energy efficiency, thermal characteristics, heating system, enclosing structures, heat loss, maintenance of thermal regime.

Thermal protection issues are important in the design and construction of buildings and structures. The thermal regime of the room is formed as a result of internal and external influences. Problems of heat protection, moisture and air conditions in rooms are provided by heating, ventilation and air conditioning systems, but are largely determined by the thermal characteristics of the enclosing structures. They are important in the design and construction of buildings and structures. The thermal regime of the room is formed as a result of internal and external influences.

Increasing the thermal protection and energy efficiency of the exterior walls should be inextricably linked with improving the quality of the thermal and air regime of the building, operating as a single energy system, while the proportion of ventilation heat loss may be even greater than heat loss through the exterior walls. The existing natural ventilation systems in residential buildings do not sufficiently provide the required indoor microclimate. Up to 40-45% of the heat from the room is lost through the enclosing structures. The heat loss associated with ventilation is 50%. In outdated residential premises, it is not possible to ensure optimal microclimate values. For example, residential buildings of mass standard series of construction before 2000 were characterized by relatively low thermal protection indicators, excessive infiltration of outdoor air and, consequently, increased consumption of thermal energy for its heating, as well as low efficiency of heating regulation [5].

The higher the level of thermal protection, the less energy resources are required to maintain the necessary thermal regime in the room. Insulation of enclosing structures is provided by choosing a heater with the lowest coefficient of thermal conductivity to ensure the required regulatory indicators. The role of thermal protection of residential buildings is especially significant for the climatic conditions of Kazakhstan, where the duration of the heating period ranges from 140 to 215 days. The need to reduce heat losses by buildings and the power of heating systems that

compensate for these heat losses is also caused by environmental problems. Atmospheric air pollution is of particular concern. Given the peculiarity of the climate of Kazakhstan, characterized by its continentality and including large fluctuations in winter and summer temperatures (Fig.4) [3, 4], maintaining a favorable climate in a residential building requires special care, especially considering that heat loss in residential buildings through walls is about 40% of all heat loss. Most studies over the past period have shown that an increase in temperature inside and outside a building can be caused by climate change, which leads to an increase in the heat island in many cities around the world ([3] , [4] , [5]). Although it is obvious that the indoor temperature can be changed with the help of equipment, measurements of the thermal environment in the open air are limited [6,7]. This is due to the fact that the outdoor thermal regime in the city significantly depends not only on the population of the city and the density of buildings, but also depends, among other things, on the intensity of traffic, the location of buildings and the availability of green parks in such a city [8 ,9].

When external fences interact with the internal and external environment of the building, heat and mass transfer processes occur. The calculations of these processes are based on the laws of stationary heat transfer. Depending on the method of heat transfer, such types of heat transfer as thermal conductivity, convection and radiation are distinguished (Fig. 1). Thermal protection of enclosing structures includes:

- reduced heat transfer resistance of individual enclosing structures;
- thermal stability properties of enclosing structures;
- heat absorption of the floor surface;
- sanitary and hygienic requirements for enclosing structures.

Acceptable solutions for the reduced heat transfer resistance of enclosing structures and heat absorption of the floor surface are given in the SP RK 2.04-107-2022 "Thermal protection of buildings". When designing, the design characteristics of building materials and structures are determined, the reduced heat transfer resistance of the building facade and individual structural elements is determined, the enclosing structure is checked for protection from waterlogging.

The design of the thermal protection of the building is made out in the section of the project "Energy Efficiency". The heat shield of the building must meet the following regulatory requirements:

а) the given heat transfer resistances of individual enclosing structures must be at least the normalized values (element-by-element requirements);

б) the specific heat protection characteristic of the building should not exceed the normalized value (complex requirement);

в) the temperature on the inner surfaces of the enclosing structures must be at least the minimum permissible values (sanitary and hygienic requirement). The requirements of the thermal protection of the building will be fulfilled while meeting the requirements "a" — "b".

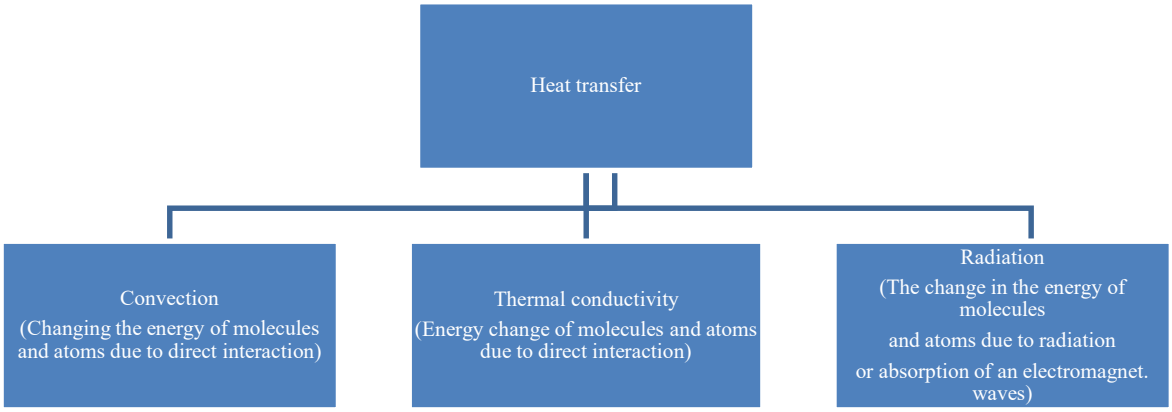

Figure 1. Diagram of internal and external influences on the building

The urban housing stock in Almaty mainly consists of buildings of the standard series E-147, 1-158, 275 series (1951-1956), 261 series (1935-1958), 1KZ-464 DS and 1KZ-464 AC (1956-1981), 308 series (1939-1981), 1-464, etc. of concrete panels, bricks, silicate blocks. All of them are built according to the requirements with the minimum permissible level of thermal protection R = 0.8 ... 1.3 (m2·0C/W) of enclosing structures. The lack of heat, in the absence of a reserve of reliability of thermal protection of the building, leads to violations of the microclimate of the premises. A decrease in air temperature and indoor surfaces, an increase in relative humidity causes steam condensation, humidification of fences and the appearance of fungus on them. Sections of the enclosing structures of residential premises affected by mold and fungi are shown in Fig.2.

Figure 2. Fungus and deformation of the finish on the inner surface of the outer walls of living rooms

The enclosing structures are moistened due to condensation of water vapor. With a decrease in air temperature to tb = 15 °With and at relative humidity ϕ= 65%, dew point temperature p = 8 °C. The permissible wall surface temperature according to the standards should be at least tp = tb – tn = 18 – 6 = 12 ° C. The temperature of the "dew point" depends on the temperature and relative humidity of the air. The higher the relative humidity at a constant room temperature, the higher the temperature of the "dew point". If the relative humidity on the inner surface of the enclosing structures is equal to or above 80%, then conditions for the formation and growth of mold appear. For the formation of mold, moisture and thermal conditions corresponding to the temperature of their formation are necessary. Even if the relative humidity in the room is within 55%- 60%, conditions can be created on the surface of structures under which the temperature of "mold formation" is set.

The growth of mold begins when the dew point temperature on the surface of the structure is exceeded by several degrees. For example, at t = +20 °C and ϕ = 60%, the temperature of the "dew

point" p = +12.0 ° C, and the temperature of the fungus is 15.3-15.4 °C. To combat mold, it is necessary to increase the temperature of the internal surfaces of enclosing structures above the temperature of the "dew point" and the temperature of "mold formation" and organize a ventilation system that provides the required relative humidity. But not in all cases, the common cause of mold and mildew formation is insufficient thermal insulation, low indoor air temperature and increased relative humidity.

Capillary moisture rising along the basement and walls of the building, external rain moisture, etc. can also be mentioned as reasons. For each specific case of humidification of fences, it is also necessary to take into account the year of construction, the design features of buildings, the material of fences.

Thermal conductivity is the transfer of heat between particles or elements of a medium in direct contact. In its pure form, thermal conductivity is observed in solids and bulk solids. Most building materials belong to solids. Therefore, in thermal engineering calculations, it can be assumed that heat propagation occurs in them only by thermal conductivity. For practical results of thermophysical calculations of enclosing structures, changes in the heat conductivity of the material from its moisture state and porosity are of great importance.

As a result of the aging of the external fences of the building, various kinds of damage gradually appear, contributing to the humidification of the structure, increasing the infiltration of outdoor air, as a result of which the thermal protective properties of the enclosing structures decrease, which leads to a deterioration in the microclimate of the premises. The coefficient of thermal conductivity- from the Fourier equation for a one-dimensional temperature field for a flat wall is equal to:

$$\lambda=\delta/q \qquad (6)$$

where: q — specific heat flow, W/m^2;

λ — coefficient of thermal conductivity, W/(m·°C);

δ — wall thickness, m.

Equation (6) is an equation of a straight line, therefore, the temperature distribution under stationary heat transfer conditions is linear. The coefficient of thermal conductivity depends on the type of material, density, humidity and temperature. For building materials, the values of the thermal conductivity coefficients vary from λ = 0.035 W/(m·°C) for polyurethane foam, to λ = 3 W/(m·°C) for granite. The thermal conductivity of building materials significantly depends on their humidity, which is formed as a result of exposure to humidity conditions of indoor and outdoor air. In turn, the operating conditions depend on the humidity regime of the room and on the humidity zone according to the zoning map. The humidity regime of the premises is accepted depending on the purpose of the buildings and premises.

The experiments of scientists show that for a material of a certain structure and humidity, located at atmospheric pressure, the coefficient of thermal conductivity depends on temperature. For many materials, with sufficient accuracy for practice, the dependence of the thermal conductivity coefficient on temperature can be assumed to be linear. The coefficient of thermal conductivity of building and thermal insulation materials ranges from 0.02 to 2.1 W/ (m · ° C), and it increases with increasing temperature. As a rule, with an increased density of the material, the coefficient of thermal conductivity increases. It depends on the structure of the material, its porosity and humidity. The presence of pores in many building and thermal insulation materials (brick, concrete, asbestos, slag, etc.) does not allow them to be considered as a continuous medium. The application of Fourier's law to such bodies is conditional.

For wet material, the coefficient of thermal conductivity is significantly higher than for dry material. This is due to the convective heat transfer resulting from the capillary movement of

water through a porous material, as well as the fact that absorbtionally bound moisture has different characteristics compared to free water.

In the design, when evaluating the thermal characteristics of multilayer structures of building walls, humidity is taken into account only for two operating conditions – A or B. The coefficient of thermal conductivity of materials under other operating conditions remains unexplored. V.N. Bogoslovsky defined the coefficient of thermal conductivity (λ) of building materials as a collective equivalent coefficient that takes into account structural parameters and all physical processes occurring in the material. One of the first Russian scientists who studied the thermal conductivity of building materials is N.N. Georgievsky. He established the dependence of the coefficient of thermal conductivity on one of the most important physical properties of materials – the degree of porosity. Currently, there is no normative document on the method of determining the dependence of the coefficient of thermal conductivity on the humidity of building materials [10].

It is also not possible to establish a general mathematical dependence for all building materials, since factors such as chemical and mineralogical composition, structure, porosity, shape and location of pores, etc. have a significant impact. Therefore, research is limited to identifying empirical dependences of the thermal conductivity of materials (λ) on their humidity (W) – λ(W) for individual materials. Empirical dependences of λ(W) have been determined in different years by such scientists as E.Shild, I. Ya. Gnip, S.A. Veialis, A.U. Franchuk, T.I. Rubashkina, R. Drochytka [6], N.V.Davydenko [7], Z. Suchorab [8]. As an example, the table shows the dependences λ(W) for some materials.

Table 1

Empirical dependences of the coefficient of thermal conductivity on the humidity of materials

Calculation formula	Characteristics of materials
$\lambda w=\lambda(1+(W_м \bullet k)/100)$	Insulation materials of organic origin
$\lambda w=\lambda(1+(W_{об} \bullet k)/100)$	Materials of inorganic origin
$\lambda w=\lambda(1+W \bullet k)$, $\Delta\lambda w=\alpha \bullet W^k$	Organic insulation of cellular structure
$\lambda w=\lambda \bullet e^{kW}$	Organic materials of fibrous structure
$\lambda w=\lambda+W_{об} \bullet k$	Inorganic materials of cellular structure
$\lambda w= k \bullet W/100+ \alpha$	Inorganic materials of cellular structure

Note.

λ , λw – the coefficient of thermal conductivity of dry and wet material, respectively, W/(m·°C);

Δ – correction coefficient of thermal conductivity, W/(m·°C); m,

$W_{об}$ – the moisture content of the material by weight and volume, respectively, %;

e – the basis of natural logarithms;

k, α – empirical coefficients

Let's consider the values of thermal conductivity for autoclaved aerated concrete, as the most commonly used in the construction of residential buildings.

Table 2

Comparative indicators of thermal conductivity of autoclave aerated concrete products

Indicators	Brand of aerated concrete	Regulatory document	
		State Standard 31359	Standard norms of the Republic of Kazakhstan 2.04-04-2011
Thermal conductivity in the dry state, λ_0, W/(m·K)	D400	0,096	0,110
	D600	0,140	0,140
The mass ratio of moisture in the material, for operating conditions and, ω_A, %	D400	4	8
	D600	4	8
The calculated value of thermal conductivity for operating conditions A, λ_A, W/(m·K)	D400	0,113	0,140
	D600	0,117	0,150
The mass ratio of moisture in the material, for operating conditions A, $\omega_Б$, %	D400	5	12
	D600	5	12
The calculated value of thermal conductivity for operating conditions Б, $\lambda_Б$, Вт/(м·К)	D400	0,160	0,220
	D600	0,183	0,260

However, there is a problem that occurs when aerated concrete blocks are used in masonry walls – the thermal uniformity of the walls, which also affects the thermal protection of external enclosing structures. The optimal geometry of the blocks makes it possible to carry out masonry from blocks not on cement-sand mortar (CPR), but on special adhesive cement compositions, when using which the thickness of the seams is not 7-8 mm (as when using CPR), but 2-3 mm. This circumstance, of course, has a positive effect on reducing heat losses through through and through heat-conducting inclusions.

Thermal conductive inclusions should include not only masonry seams, but also:

the abutment of transverse inner walls and columns to the outer walls;

door and window lintels, reinforced belts;

the places where the discs of the floor slabs adjoin the external curtain walls;

places of support of reinforced concrete slabs on external load-bearing walls;

places of connection of the base with the walls, flexible and rigid connections;

anchors for fixing the thermal insulation layer, etc.

The presence of thermal engineering inhomogeneities in the shell of the building significantly worsens the temperature and humidity regime of the enclosing structures [7]. Based on the experience of construction of housing construction facilities in Moscow, wall products (blocks) made of autoclaved aerated concrete were used in masonry. When the masonry walls were finished, it was decided to additionally insulate the exterior walls. Not so much to increase the heat transfer resistance of the exterior walls, but to close numerous heat-conducting inclusions [7]. On some sites, the exterior walls of aerated concrete may intersect transverse reinforced concrete walls or reinforced concrete columns. Deterioration of thermal protection properties of wall structures in the form of aerated concrete blocks masonry was also revealed in operated buildings [7]. In the surveyed buildings, all exterior walls are made with external brickwork cladding, without an additional layer of effective thermal insulation. The analysis of the results showed the following:

1. 62% of the examined structures have defects, which indicates their mass character;
2. all defects are difficult to repair and require dismantling of building structures;

3. the majority of defects (90%) are noted in the junctions of window blocks to wall openings, which is explained by the non-compliance of window blocks with regulatory requirements for thermal protection, improper installation of window blocks, inadequate quality of thermal insulation of mounting seams (Fig. 5);
4. defects in the junctions of the outer wall with the column (10%) they are explained by the presence of heat-conducting inclusions in the form of reinforced concrete columns of the building frame due to deviations from the project;
5. almost half of the surveyed structures (51%) are susceptible to moisture condensation and the formation of mold fungi under design conditions;
6.11 % the examined structures have through freezing in the nodes.

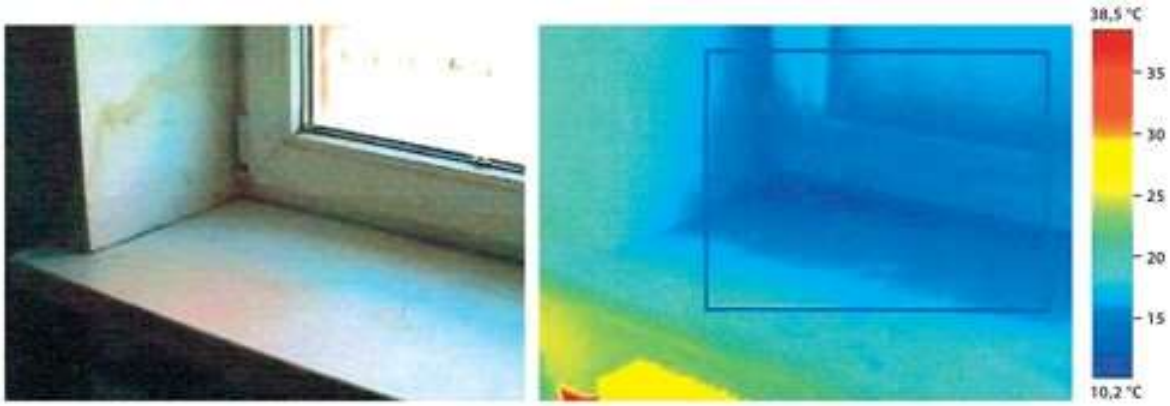

Figure 3. Thermal engineering defects in the junctions of the window block to the wall opening

When exterior walls are finished, all these masonry defects will not be visible, but heat-conducting inclusions (cold bridges) will remain. To increase the thermal uniformity and the overall level of thermal protection of the exterior walls of aerated concrete blocks, it is necessary to install a continuous outer layer of thermal insulation. A solid outer layer of thermal insulation, among other things, will increase the durability of the inner layer of the wall, since with external insulation the blocks will be in the region of positive temperatures. As a result, they will not experience freeze–thaw cycles during operation. Thus, for most areas, the thickness of 300-400 mm blocks without additional insulation is insufficient to provide the required values of the reduced heat transfer resistance.
In the CIS countries, the main normalized characteristic of the thermal protection properties of enclosing structures is the value of heat transfer resistance RT, $m^2 \cdot °C/W$. In the countries of the European Union, the heat-protective properties of enclosing structures are estimated by the coefficient of heat transfer K, $W/(m^2 \cdot °C)$.

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Aerated concrete blocks

Aizhan Makulbekova

Korkyt Ata Kyzylorda University, 2nd year master's student of the specialty 7M07365 – "Construction", Kyzylorda, Kazakhstan

Keywords: aerated concrete, light concrete, sand, air conditioner, porosity, blocks, filler, computer modeling

Annotation:

According to Wakili et al. (2015) aerated concrete (AC) is a lightweight concrete having low density and high porosity in comparison with other building materials, where air constitutes 20-90% of the total volume. AC is produced from sand, cementitious material, air-forming chemical, and water. Its parameters vary depending on the production methodology, having a density range of 93-1800 kg/m^3. The material is assumed to be commonly used, as it has both good mechanical and thermal characteristics (Jerman, 2013). In general, AC is widely known for its energy-efficient properties, as it has considerably low thermal conductivity. As the thickness of wall in building increase, thermal conductivity value is decreases. If low thermal conductivity material is used, the thickness of wall can be reduced. Aerated concrete offers high level of thermal insulation of buildings at low wall thickness, and low self-weight, respectively (Pruteanu and Vasilache, 2013). Therefore, application of aerated concrete in this project is emphasized by the purpose to reduce building energy consumption as wall blocks.

Aerated concrete is manufactured by entraining air voids deliberately, to come up with lightweight, cellular concrete form. It can be divided into 2 major types based on production method: foamed and aerated concrete (Newman, 2003).

Foamed concrete is produced by injecting a foaming agent into the base mix. In such mixture, no chemical reaction takes place, therefore, it is considered to be the most economical and controllable method of cellular concrete casting (Narayanan and Ramamurthy, 2000). The porosity of the concrete is achieved by adding foaming agent into the mix, which produces air voids that are included in the cement paste (Hamad, 2014). Consequently, foamed concrete characteristics directly depend on the foaming agent properties.

Next wayof pore-formation in cellularconcretes, is based on the formation of gas bubbles by reaction of chemicals, commonly aluminum powder, with the liquid cement mortar. Concentration of air voids and properties of hardened sample from this reaction depend on the alkalinityof mortar mix. Thus, sand with high silicacontent is favorable foraerated concrete production (Narayanan and Ramamurthy, 2000). Aluminum powder based porous concrete manufacturing method is assumed to be the best solution by Hamad (2014). Table 2.8. Concrete blocks characteristics comparison provide better isolation. All three materials are highly reusable, and environmentally conscious, respectively. (Yang and Lee, 2014 & Aggregate Industries, 2016)

Parameters	Dense aggregate blocks	Lightweight aggregate blocks	Aerated concrete blocks
Weight			
Insulation			
Sound absorption			
Fire resistivity			
Durability			
Reusability			
Compressive strength			
Environmentally friendly			
Typical thermal conductivity (W/mK)	0.70 - 1.28	0.25 - 0.60	0.09 - 0.40

Specimens	Flow (mm)	Defoamed depth (mm)	γ_d (kg/m^3)	Compressive strength (MPa)			E_c (MPa)	ε_0	λ (W/m K)
				3 days	7 days	28 days			
G1-1000	225	0	493	1.42 (??)	1.96 (??)	2.45	1294	0.0024	0.145 (?)
G1-1250	230	0	496	1.93	2.56	2.85	1696	0.0023	0.138
G1-1500	250	0	477	1.43	1.87	2.46	1384	0.0022	0.134
G1-2000	255	0	477	1.39	1.92	2.34	1181	0.0018	0.137
G1-2500	265	0	487	1.33	2.01	2.42	1400	0.0022	0.127
G2-30	200	0	562	2.75	2.99	4.25	2395	0.0024	0.157
G2-27.5	200	0	570	2.88	3.41	4.32	2115	0.0026	0.160
G2-25	202	2	541	3.15	3.56	4.57	2045	0.0022	0.153
G2-22.5	266	3	545	3.11	3.04	4.17	2071	0.0024	0.163
G2-20	263	5	547	1.81	3.21	3.66	1740	0.0026	0.159
G3-400	235	3	425	1.57	2.01	2.07	1421	0.0020	0.118
G3-450	245	2	491	2.24	2.75	2.99	1562	0.0025	0.139
G3-500	248	2	531	2.57	3.07	3.42	2017	0.0022	0.142
G3-550	237	1	618	3.50	4.15	4.98	2753	0.0024	0.176
G3-600	240	0	674	4.83	4.90	5.88	2966	0.0025	0.199
G3-650	245	0	694	5.23	5.47	6.93	3252	0.0026	0.184

Table 2.9. Aerated concrete parameters

Size (mm)	440x215	440x215	290x215	440x215	440x215
Thickness (mm)	100	140	140	100	140
Density (kg/m³)	1950 (Dense)	1950 (Dense)	1950 (Dense)	1450 (Lightweight)	1450 (Lightweight)
Weight (kg)	18.73	26.22	17.28	14.13	19.78
Strength	7.3 and 10.4 N/mm²	7.3 and 10.4 N/mm²	7.3 and 10.4 N/mm²	7.3 and 10.4 N/mm²	7.3 and 10.4 N/mm²
Thermal conductivity (W/mK)	Int. 1.27 Ext. 1.37	Int. 1.27 Ext. 1.37	Int. 1.27 Ext. 1.37	Int. 0.78 Ext. 0.84	Int. 0.78 Ext. 0.84

Table 2.10. Dense and lightweight aggregate blocks parameters

AC block has a range of positive characteristics, including light weight, high thermal and sound insulation, and fire resistivity. It also has some drawbacks as low compressive strength, so that it can not be used as a load bearing material. As given project focuses on energy consumption reduction, aerated concrete blocks were chosen for construction. To conduct energy consumption study for further introduction with aerated concrete, it was decided to carry out AC blocks casting laboratory works and software energy modelling. Therefore, different mixture proportions were compared makingan emphasis on their thermal conductivity to choose the most appropriate in terms of energy conservation. In general, within aerated concrete mixture dry basis of the ingredients constitute approximately 70% of the total mass, while other 30% is water (Ropelewski and Neufeld, 1999). TheTable 2.11below illustrates the hardened properties for different mix designs.

Table 2.11. Hardened properties comparison

Sources	Density (kg/m³)	Thermal conductivity (W/m°C)	Compressive strength (MPa)
Ecoton (2016)	500	0,109	4,5
Wongkeo et al. (2012)	1457	0,57	9,5
Newman and Choo (2003)	450	0,12	3,2
Aruova and Dauzhanov (2014)	797	0,219	5,4

By comparing the data presented in Table 2.11, mixture design proposed by Ecoton Company was chosen as a reference for further examinations. The mix proportions for casting 1 m³ aerated concrete are shown in Table 2.12.

Table 2.12. Aerated concrete mix proportions provided by Ecoton (V = 1 m³)

Component	Amount	Units
Fine sand mixture	467	kg
Lime	94	kg
Cement	93	kg
Gypsum	20	kg
Aluminium powder	433	g
Water	64	l
Waste	167	kg

However, during laboratory testing the fact that Ecoton casts Autoclaved Aerated Concrete (AAC) should be taken into account. It is supposed that the hardened characteristics of Non-Autoclaved Aerated Concrete would be slightly lower in comparison with AAC, which will be defined and proved during consequent project stages.

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ВЕКТОРИ РОЗВИТКУ СУЧАСНОЇ ХАРЧОВОЇ ПРОМИСЛОВОСТІ: ТРАДИЦІЇ І НОВАТОРСТВО

Сімахіна Галина Олександрівна
Доктор технічних наук, професор, завідувач кафедри технології оздоровчих продуктів, Національний університет харчових технологій
Михайлова Раїса Василівна
Генеральний директор Товариства з обмеженою відповідальністю «Фірма «ФАВОР», м. Київ, Україна

У представників медицини, харчових технологій і виробників харчової продукції спільна мета – здоров'я української нації.

Медики йдуть до цієї мети, лікуючи хворих, займаючись профілактикою здорових, і основний інструмент їхнього впливу, особливо у гастроентерологів, дієтологів, нутриціологів, особливо для профілактики захворювань – це харчування, харчування адекватне потребам пацієнта на даний момент.

Науковці конструюють, а підприємства виробляють і доводять до столу споживачів харчові продукти різних найменувань та різного призначення.

Тому дуже доречно процитувати зараз вислів Айзека Азимова – знаменитого письменника, ученого зі світовим ім'ям великого популяризатора науки, який звучить так: «Очевидно, першим серйозним досягненням медицини стало визнання лікарями факту, що однією із запорук здоров'я є проста і збалансована дієта».

Це раніше ми розглядали харчові продукти лише з точки зору енергетичного забезпечення організму та як джерело надходження різних нутрієнтів для побудови клітин, тканин, органів.

А на сьогодні нутриціологія сформулювала такі основні функції їжі:

Енергетична функція – забезпечення організму енергією шляхом її виділення в процесі метаболізму нутрієнтів;

Пластична функція – забезпечення організму пластичними речовинами для побудови клітин, тканин, органів;

Біорегуляторна функція – регулювання метаболічних процесів за участі ферментів і гормонів;

Пристосувально-регуляторна функція – регулювання діяльності систем організму (травлення, виділення, терморегуляція);

Імунно-регуляторна функція – забезпечення здатності організму протистояти впливу ушкоджуючих біологічних, хімічних та фізичних чинників довкілля;

Реабілітаційна функція – нормалізація функцій організму за рахунок лікувально-профілактичної дії есенціальних нутрієнтів;

Смакова функція – регулювання харчової мотивації (апетиту). Вона пов'язана з постачанням в організм смакових речовин, які сприяють підтриманню на певному рівні харчової мотивації.

І перелік функцій їжі буде лише розширюватись і поповнюватись новими знаннями про вплив їжі на організм людини, а значить і будуть збільшуватись можливості лікарів – дієтологів максимально ефективно допомагати своїм пацієнтам.

Таке твердження цілком об'єктивне, оскільки в нинішній час харчова промисловість дуже успішно опановує новий вектор свого розвитку – створення індустрії оздоровчих продуктів. І такі продукти уже стали світовим трендом.

Декілька цифр:

1987 рік – Японія першою випускає на світовий ринок першу партію функціональних оздоровчих продуктів;

2002 рік – на світовому ринку реалізовано оздоровчої продукції на 51,3 млрд. дол. США;

2007 рік – 114,1 млрд. дол. США;

2012 рік – 165,6 млрд. дол. США;

2021 рік – 700 млрд. дол. США;

Прогноз на 2030 рік – понад 1 трильйона дол. США.

У переліку учасників світового ринку оздоровчих продуктів поки що немає України. Однак вітчизняні науковці докладають усіх зусиль, аби забезпечити своє населення продукцією оздоровчого, профілактичного, лікувального призначення.

Світовий досвід, доказова медицина переконливо свідчать про те, що саме на основі оздоровчих продуктів кожен лікар-дієтолог зможе підібрати індивідуальний раціон для своїх пацієнтів з урахуванням їх віку, статі, виду діяльності, стану організму і навіть харчових звичок та харчових стереотипів.

І коли Україна стане виробляти хоча б 30-40% оздоровчих продуктів (до загальної кількості харчових продуктів), у раціонах харчування населення будуть такі групи оздоровчих продуктів:

- продукти зі зниженим вмістом цукру;
- продукти зі зниженим вмістом солі;
- продукти, у яких технологічно у складі кухонної солі частину іонів Na буде замінено на іони К (і це стане великою підтримкою для роботи і серцево-судинної системи, і ШКТ);
- безглютенові і безлактозні продукти з низьким глікемічним індексом;
- продукти зниженої калорійності;
- продукти для дітей до 3-х і до 6-ти років;
- продукти для підлітків, шкільної та студентської молоді;
- продукти геродієтичного спрямування;
- продукти для вагітних жінок і молодих мам;
- продукти дезінтоксикаційної дії з натуральними сорбентами;
- продукти адаптогенної, імуномодулюючої, загальнозміцнюючої, онкопротекторної, антитоксичної дії;
- дієтичні добавки багатофункціонального спрямування;
- соковмісні напої, фітоконцентрати тощо.

Це все цілком реально. В Україні прекрасні природні ресурси і сільськогосподарської сировини, і пряно-ароматичної, і лікарської. Це джерела усіх необхідних організмові людини біологічно активних речовин і нам зовсім немає потреби використовувати у рецептурах харчових продуктів шкідливі харчові добавки з індексом Е. У країні працюють ефективні наукові школи з моделювання і створення таких продуктів, технологи максимально використовують сучасні відомості доказової медицини щодо ролі тих чи тих нутрієнтів у функціонуванні організму людини; завдяки таким відомостям технологи розуміють важливість таких поки що малодосліджених сполук, як мікроелементи хром, мідь, марганець, кобальт, і впроваджують їх у рецептури нових продуктів.

Багато харчових підприємств готові виробляти таку продукцію. А підприємство з виробництва молочної продукції «Фавор», яким керує генеральний директор Раїса Михайлова, уже 30 років спеціалізується на виробництві молочних оздоровчих продуктів для

дітей; продуктів, які не містять жодних штучних добавок, лише натуральна сировина і постійне впровадження нових рецептур. Учені довели корисну роль стевії, і тут же з'явились кисломолочні продукти зі стевією. І так постійно розвивається це підприємство. І це не просто виробництво молочної продукції, це місія – важлива для держави і для кожної родини. Недаремно гаслом цього підприємства є вислів «Здорові діти – щаслива родина». Тому споживачі охоче купують цю продукцію для себе, передусім для своїх дітей.

То чого ж не вистачає, аби в Україні швидкими темпами налагоджувалось виробництво оздоровчих продуктів і для лікування хворих, і для профілактики здорових, щоб за цим показником досягти рівня провідних країн світу, де в раціонах харчування 75-80% продукції належить до категорії «оздоровчої»?

Насамперед бракує уваги державних органів до цієї проблеми, розуміння ними того, що здоров'я нації – це спільні зусилля медицини і харчової промисловості. Україна досі не має дієвого закону про державну політику в галузі здорового харчування, підприємства не мають матеріальної зацікавленості у переході на виробництво нової продукції. Необхідно припинити тотальне, неконтрольоване використання у рецептурах харчових продуктів, передусім, для дитячого харчування, шкідливі харчові добавки з індексом Е: сільськогосподарська сировина забруднена пестицидами, отрутохімікатами (засобами захисту рослин), які потрапляють і в готову продукцію; виробництво і використання ГМО; відсутність органічної сировини.

З точки зору виробництва оздоровчих продуктів, постійно йде акцент на заборону штучних добавок. Для розуміння цього варто проаналізувати «чорний список» харчових добавок:

Барвники (від Е 103 до Е 153) – викликають утворення злоякісних пухлин (морозиво, кондвироби, солодкі напої);

Консерванти (Е 211, 213, 221-226) – викликають злоякісні пухлини ШКТ), містяться у більшості продуктів;

Стабілізатори (Е 407-450, 461-466) – викликають захворювання печінки і нирок, ШКТ.

Розлад травлення, алергічні реакції викликають добавки Е 338-341, 407, 450-466.

Підсолоджувач аспартам Е 951 викликає рак мозку та нирок.

А для дітей узагалі шкідливі усі добавки.

А тепер коротенько оглянемо перелік завдань, які необхідно вирішити технологам та виробничникам, аби у розпорядженні громадян був широкий перелік продуктів для різноманітних потреб. Сукупність цих завдань називається життєвим циклом продуктів:

І стадія – маркетингові дослідження. На цій стадії визначаємо потреби споживачів у таких продуктах, окреслення цільових категорій споживачів, формулювання вимог до таких продуктів на основі медичних знань щодо впливу компонентів продукту на організм споживача;

ІІ стадія – створення концепції продукту. Базується на систематизації даних про потреби споживачів, нутрієнтного складу продуктів, особливості технологій виробництва, заплановані методи комерціалізації для встановлення рівня технологічного, ринкового і стратегічного ризиків, а також можливості вирішити проблему імпортозаміщення.

ІІІ стадія – розроблення нутрієнтного складу продукту з урахуванням медичних вимог, органолептичних властивостей, безпека і якість.

IV стадія – виробництво продукту : підбір основної і допоміжної сировини, підбір найбільш ефективних технологічних способів, що гарантують високу якість і безпеку продуктів; адаптація існуючих харчових підприємств до виробництва нових продуктів і підбір пакувальних матеріалів, організація контролю на всіх етапах виробництва; фахова підготовка персоналу; забезпечення чинних санітарно-гігієнічних вимог.

V стадія – оцінка якості і безпеки готової продукції з використанням принципів НАССР (міжнародна система управління безпекою харчових продуктів).

VI стадія – стандартизація продукту, тобто затвердження рецептури продукту, розроблення технічних умов і технологічних інструкцій, отримання відповідного гігієнічного висновку.

VII стадія – зберігання продукту. Це одна із останніх стадій життєвого циклу продукту. Тут особливо роль приділяється пакувальним матеріалам і умовам зберігання продукту. Пакувальні матеріали повинні бути безпечними, не забруднювати довкілля.

VIII стадія – комерціалізація продукту. Тут визначають обсяги виробництва даного продукту на основі аналізу потреб і замовлень, в тому числі і від медичних органів, аптечних мереж (якщо йдеться про дієтичні добавки); організовують канали реалізації.

IX стадія – зворотній зв’язок зі споживачами. Це аналіз відгуків про продукцію з боку споживачів, дієтологів, нутриціологів, які надходять в основному, шляхом анкетування.

А ще необхідно врахувати численні ризики, пов’язані з сировиною, нестабільністю складу продукту при виробництві і зберіганні. Та найважливішим є забезпечення цілісності процесів управління якістю на всіх етапах життєвого циклу продукту, який, наприклад, на описаному вже підприємстві «Фірма «Фавор» здійснюється на основі сучасних принципів НАССР.

Ось такий складний шлях проходять технологи і виробничники, аби і споживачі, і пацієнти, і лікарі-дієтологи мали в своєму розпорядженні широкий асортимент продукції, яка сьогодні на світовому ринку позиціонується як оздоровча, профілактична, лікувальна.

Усі нові продукти, над якими зараз працюють і науковці, і практики харчових виробництв, повинні відповідати вимогам до харчових продуктів XXI століття: якість, безпека, ефективність.

Перші два критерії – якість і безпека – характерні і для традиційних харчових продуктів. Разом з тим, якщо для традиційних продуктів показник безпеки передбачає оцінку хімічної та мікробіологічної забрудненості продуктів, то для інноваційної продукції ми маємо враховувати ще ступінь збалансованості продукту за основними інгредієнтами (що свідчить про максимальну їх засвоюваність).

І для нових продуктів включено ще додатковий показник – ефективність. Він оцінюється за такими складовими:

- збереження і поліпшення стану здоров'я споживачів і пацієнтів при постійному вживанні таких продуктів;
- зниження ризику аліментарних хвороб (їх є понад 2000); запобігання дефіциту основних нутрієнтів;
- стійкий позитивний ефект як у профілактиці хвороб, так і при їх лікуванні.

З цього переліку зрозуміло, що об'єктивно оцінити показник ефективності того чи іншого продукту можна лише спільними зусиллями медиків (передусім дієтологів), клініцистів, науковців харчових галузей та виробників продукції.

Наша промисловість уже випускає ряд продуктів, що належать до сфери оздоровчих: хлібобулочні вироби з добавками насіння льону, соняшника, гарбуза, висівок; молочні продукти з добавками біфідо- і лактобактерій (біойогурти, біокефіри), сюди ж належить вся продукція підприємства «Фавор», продукти безглютенові і безлактозні. Однак ця частка поки що дуже мала – до 5-8% від загального обсягу харчових продуктів.

Тому в раціонах переважають традиційні харчові продукти. Тут постає два основні питання – їхня якість та безпека. Ми вже з'ясували, що відповідальність за ці показники несуть технологи підприємства. А контролює продукцію організація «Держпродспоживслужба» та підпорядковані їй регіональні управління.

Ця організація вживає ефективних засобів для захисту прав споживачів. До речі 15 березня відбувся Форум асамблеї «Споживач – держава – бізнес: відповідальна та ефективна взаємодія» з нагоди Всесвітнього дня захисту прав споживачів. На Форумі було озвучено ті інновації, які підготувала нам Держпродспоживслужба:

- започатковано функціонування інформаційного каналу «Захист прав споживачів»;
- застосовуються цифрові технології, і більшість скарг уже надходить електронною поштою;
- проводиться просвітницька робота;
- впроваджується Програма контролю сирого молока в Україні;
- створюється національна референс-лабораторія з ветеринарно-санітарної експертизи молока і молочних продуктів (кількість досліджень якості молока у 2023 р. зросла на 62% порівняно з 2022 р. Це неймовірний результат);
- ставиться вимога до впровадження системи НАССР на всіх харчових підприємствах.

Тобто, контроль за якістю і безпекою продуктів досить високий. Він здійснюється у повній відповідності до статті №3 Конституції України «Людина, її життя і здоров'я, недоторканість і безпека визнаються в Україні найвищою соціальною цінністю». Проте деякі підприємства намагаються обійти його, вдаються до фальсифікації харчових продуктів. В чому вона полягає?

Фальсифікація – це власне підробка складу харчового продукту за рахунок збільшення частки менш якісної сировини. заміна сировини високого ґатунку на сировину першого або другого ґатунку, введення штучних добавок тощо. Рівень фальсифікації продуктів зараз

досить високий і прикро те, що виявити цю фальсифікацію усе складніше. Необхідні нові програми, в т.ч. комп'ютерні, нові методики, нове обладнання.

І все починається із сировини. Відомо, що в Європі третина усіх продуктів містить ГМО. У США – майже 60%, а скільки в Україні – навіть невідомо.

Негативно впливає на стан здоров'я людини використання антибіотиків в процесі росту худоби та птиці; неконтрольоване використання штучних добавок тощо.

Які продукти найчастіше фальсифікують? Звісно, ті, які користуються найбільшим попитом у споживачів.

Фальсифікація молока і молокопродуктів

Жоден ринок у світі не існує без молока і молочних продуктів. Вони користуються великим попитом і тому викликають у виробників спокусу їх фальсифікувати, намагаючись витратити на виробництво коштів менше, а прибуток отримати більший: додають воду, знижують вміст молочного жиру, додають сторонні компоненти – борошно, крохмаль, штучні добавки до молока, яке прокисає, додають соду для нейтралізації кислот. Загалом, це не може принести істотну шкоду для споживача, однак це вводить його в оману, якісний продукт замінюється менш якісним, порушуються права споживачів.

Однак деякі виробники додають до молочної продукції гідрогенізовані рослинні олії, в яких у процесі гідрогенізації утворюються трансжирні кислоти. Останнім часом наукові дослідження у сфері безпеки харчових продуктів переконливо довели про їхню шкоду для здоров'я. Про це знають усі лікарі-дієтологи і, мабуть, попереджають своїх пацієнтів, що вживання продуктів із трансжирами підвищує ризик серцево-судинних захворювань, сприяючи збільшенню рівня ліпопротеїдів низької щільності і зменшення рівня ліпопротеїдів високої щільності, порушуючи ліпідний обмін і провокуючи виникнення атеросклеротичних бляшок. Ці небезпечні жири можуть також викликати розвиток пухлин жіночої статевої системи, легенів, товстого кишечника та простати. Кількість таких трансжирів у так званому «вершковому маслі» може досягати 50-65%.

Джерелом трансжирів є не лише фальсифіковані молочні продукти (в тому числі і морозиво), а й усі продукти фастфуду та вуличної їжі, маргарини, кондвироби, чипси, сухарики і навіть сири зі зниженим вмістом холестерину.

Наявність трансжиру повинна обов'язково вказуватись на етикетці: маргарин, рослинний жир, кулінарний жир, частково гідрогенізований рослинний жир, фритюрний жир, комбінований жир, гідрогенізована олія. Однак недобросовісні виробники ігнорують це правило. І тому таким важливим рішенням Держпродспоживслужби є створення в Україні національної референс-лабораторії з ветеринарно-санітарної експертизи молока і молочних продуктів. Хочеться сподіватись, що у перспективі такі лабораторії буде відкрито і для оцінки безпеки усіх інших харчових продуктів, які теж можуть зазнавати фальсифікації.

Фальсифікація м'яса та м'ясопродуктів

М'ясо підфарбовують фуксином – барвником яскравого червоно-пурпурного кольору (кольору мадженти). Хоча основне призначення цього барвника – текстиль, проведення мікробіологічного аналізу, додають до лікарських засобів як протимікробний препарат. За класифікацією хімреактивів – це токсична та канцерогенна речовина.

У ковбаси додають сою (соєвий білок розбухає і збільшує вихід продукції), кров, воду, клейковину, несвіже м'ясо, рослинні компоненти, крохмаль, шкіру, сухожилля, сполучну тканину, перемелені кістки тощо. А відсутність на прилавках традиційних «синіх» курей – результат їх оброблення відбілювачами (в кращому разі кип'яченим розчином соди).

На етикетці продукту, що містить такий ковбасний фарш, має бути зазначено «ММО – м'ясо механічного обвалювання», але хіба споживач розуміє, що це значить? Водночас, такі продукти небезпечні: кістки накопичують важкі метали, радіонукліди, інші токсиканти; в ММО потрапляють уламки кісток до 0,75 мм, які можуть травмувати кишечник (а діти дуже люблять сосиски і молочні ковбаси).

Харчові жири

Фальсифікація харчових жирів не відзначається оригінальністю. Особливо часто підробляють рафіновані олії. До таких дорогих олій як оливкова, кукурудзяна, горіхова додають дешеву соняшникову, рапсову або бавовняну. При цьому знижується вміст цінних ПНЖК та збільшується частка осаду. Однак ступінь такого розбавлення виявити практично неможливо. Технології фальсифікування продуктів також удосконалюються.

Для цього виду харчових продуктів практично відсутня правдива інформація. Тому не потрібно вірити таким позначенням на етикетці, як «екологічно чистий продукт», «відбірний продукт», «першого віджиму» тощо. Це все обман споживача.

Фальсифікація соків

У даному разі фальсифікацію здійснюють також трьома способами: якісним, кількісним, інформаційним.

Якісний спосіб – додають різні компоненти, не передбачені рецептурою; змінюють типи напоїв, необхідні показники підганяють, додаючи цукор і лимонну кислоту.

Кількісний спосіб – соки розводять водою і якщо додати до 20% води, то цього не виявлять навіть дегустатори. Фальсифікація стає очевидною, коли додають 50% води, тому виробники обмежуються додаванням 30% води. Купажують дорогі соки з дешевими (про це не зазначається у супровідних документах), з різними фруктовими екстрактами; додають штучні барвники, ароматизатори, стабілізатори.

На цих декількох прикладах ми окреслили непривабливі сторони виробництва харчових продуктів, однак будемо вірити, що випадки ці поодинокі, виробники чесні перед споживачами своєї продукції, а Держпродспоживслужба буде лише посилювати свій контроль. Оператор ринку, який сьогодні несе відповідальність за випуск і реалізацію харчових продуктів, повинен вимагати від виробника усі необхідні посвідчення про якість і безпеку продукції.

Повертаючись до початку статті, можна узагальнити, що зазначені недоліки характерні лише для традиційних харчових продуктів, а оздоровче харчування ґрунтується на зовсім іншій основі. Виробники оздоровчих продуктів, як і медики, керуються принципом Гіппократа: «Не зашкодь!»

Саме оздоровчі продукти є базою для дієтопрофілактики, для харчування хворих і здорових людей. І це є вагомою основою співпраці медиків, технологів-харчовиків та виробників продукції.

Наука про харчування, про вплив компонентів їжі на стан організму постійно розвивається. Зокрема, наука нутригеноміка, яка розглядається як галузь, що вивчає взаємодію між харчуванням та організмом людини (геномом). Йдеться про генетику харчування – це розділ нутригеноміки, що фокусується на взаємодії між варіантами генома і дієтою. Для практичного застосування цих даних за кордоном уже розроблено стратегію аналізу результатів, які було включено в прості у використанні програмні пакети для нефахівців. І за кордоном дедалі більше учених – дієтологів включають у свої дослідження дані про зв'язок між харчуванням людини і її геномом, що дає можливість з'ясувати вплив

генетичних варіацій на взаємодію між дієтою і захворюванням. Така нутригеномна медицина використовує принципи харчової геноміки, щоб краще зрозуміти механізми, що керують клітинним гомеостазом, і згодом вибрати варіанти дієти, які найбільше підходять для конкретного індивідуума і які дозволяють усунути відхилення у стані здоров'я людини.

На сьогодні з огляду на досягнення нутригеноміки (нутритивної геноміки) сформульовано основні постулати, які визначають цей науково-практичний напрям і окреслюють нові можливості перед галузями медицини, які безпосередньо використовують харчування як профілактичний та лікувальний інструмент:

- компоненти їжі прямо чи опосередковано впливають на геном людини, змінюючи роботу генів;
- у певних умовах і при визначеному генотипі дієта може стати важливим чинником стану здоров'я;
- деякі гени, що регулюються дієтою, визначають чистоту і тяжкість хвороби;
- за допомогою дієти можна активно впливати на роботу генів, що відкриває можливості для підбору персоналізованого харчування для профілактики та лікування хронічних хвороб.

Варто зазначити, що персоналізоване харчування – це використання даних про генетичний склад організму, мікробіом, спосіб життя та стан здоров'я людини для створення індивідуальних дієтичних рекомендацій, спрямованих на оптимізацію здоров'я, когнітивних функцій, фізичної форми та запобігання хворобам.

Накопичений світовий досвід дає можливість сформулювати ряд основних напрямів розвитку сучасних харчових технологій:

– використання сучасних ощадних технологічних процесів (ресурсо- та енергоощадних), гнучких форм організації виробництва, здатних забезпечувати прискорений перехід до отримання нових конкурентоспроможних харчових продуктів, які мають інноваційне наповнення і користуються підвищеним попитом на ринку;

– широке впровадження методів швидкого освоєння виробництва нових харчових продуктів на інноваційній основі, що позиціонуються як оздоровчі, профілактичні, спеціальні, функціональні тощо;

– розроблення і застосування технічно досконалих систем контролю якості сировини і готової продукції та систем управління якістю;

– забезпечення постійної планомірної ефективної роботи харчового інноваційного підприємства завдяки взаємоузгодженості та взаємозумовленості організаційних, технологічних, економічних, екологічних та соціальних чинників;

– широке залучення до сфери харчових технологій вторинних сировинних ресурсів та нетрадиційної сировини;

– постійне вдосконалення технологій виробництва інноваційної продукції і їх відповідність світовим тенденціям розвитку індустрії здорового харчування.

Ұшқын плазмалық пісіруден кейінгі Ti-Al-Nb негізіндегі металлараλық композиттер

Жорашева Уйринса Алишерқызы
Қожа Ахмет Ясауи атындағыш, Халықаралық Қазақ-Түрік университетінің жаратылыстану факультет магистранты, Ғылыми жетекші: Ш.Р. Курбанбеков Phd., доцент, Түркістан, Қазақстан

Аңдатпа:Мақалада зерттеу материалдары-ұшқын плазмалық пісіруден (SPS) кейінгі Ti-Al-Nb негізіндегі металлараλық композиттер алынды. Алынған ұнтақтардың композициялық бөлшектердің мөлшері анықталды. Әр түрлі ұнтақ қоспаларының қысқаша сипаттамасы, құрылымы және физика-механикалық қасиеттері қарастырылды. Титан негізіндегі үштік жүйесіне тиісті қорытпалардың фазалық құрамы және құрылымы зерттелді. Бұл жұмыста ұсақтау шарикті дірілде жүргізілді. Ол FRITSCH PULVERISETTE 0 диірмені деп аталады.

Электронды микроскопия арқылы жоғары ажыратымдылықтағы кескіндерді алуға мүмкіндік береді (дейін~ 1 Å дейін) және фазалық құрамын, кристалдық құрылымын анықтауға болады.Объектілердің микроқұрылымын бақылау және суретке түсіру Olympus Жарық металлографиялық микроскопында x50-ден x1000-ға дейінгі ұлғайту диапазонында жүргізілді.

Кілт сөздер: интерметаллид, микроқұрылым, стехиометрия, физика-механикалық қасиеттері, фазалық күйлері.

Ti–Al–Nb қорытпаларын қатайту бағыты. Бұл мәселе бойынша аз зерттеу жұмыстары жүргізілді, сондықтан пісіру процесінің Ti–Al–Nb қорытпаларының құрылымына, фазалық күйіне және физикалық-механикалық қасиеттеріне әсері қосымша зерттеуді қажет етеді.

Стехиометрия (грек тілінен-негіз, элемент және мет метрия), реактивтер мен химиялық реакциялар өнімдері арасындағы сандық қатынастар (массалық немесе көлемдік) туралы ілім; химиялық формулаларды шығаруды және реакциялардың химиялық теңдеулерін құруды қамтиды. "Стехиометрия" терминін (1792-1793) И.Рихтер ұсынды, ол орташа тұздардың түзілуіне қажетті қышқылдар мен негіздердің мөлшері арасындағы салмақ қатынасын зерттеді. Стехиометрияның негізін массаның, эквиваленттердің, Авогадроның, Гей-Люссактың сақталу заңдары, құрамның тұрақтылығы, қатынастардың еселігі құрайды. Стехиометрия заңдарына сәйкес заттың реакциясына түсетін қатынастар осы заңдарға сәйкес қосылыстар сияқты стехиометриялық деп аталады. Стехиометрия заңдарынан ауытқулар байқалатын заттар стехиометриялық емес деп аталады. Стехиометрия заңдары заттардың формулаларына, реакция өнімдерінің теориялық мүмкін шығуын табуға және т. б. байланысты есептеулерде қолданылады.

Зерттеу материалдары-ұшқын плазмалық пісіруден (SPS) кейінгі Ti-Al-Nb негізіндегі металлараλық композиттер.

ПТК-1 (ТУ 14-22-57-92) титан ұнтағы бөлшектердің өлшемі 40-50 мкм, ниобий ұнтағы НбП-1а (ГОСТ 26252-84) (Ti-Al-Nb) өндірісінің бастапқы материалдары ретінде пайдаланылды, композициялық.бөлшектердің мөлшері 40-50 мкм, алюминий ұнтағы 5 мкм.

а) б) в)

Бастапқы заттардың сырқы түрі а)титан б)алюминий в) ниобий

1-сурет

Шихта құрамы

№1	Ti-23,5ат.%Al-21ат.%Nb
№2	Ti-24,5ат.%Al-24,5ат.%Nb

Ұнтақты металлургияда кез келген металл ұнтағын алу үшін механикалық ұнтақтау қолданылады. Өздеріңіз білетіндей, өндірісте механикалық ұнтақтауды қолданған жөн кремний, бериллий сияқты сынғыш металдар мен қорытпалардың ұнтақтары, сурьма, хром, марганец, ферроқорытпалар, алюминий мен магний қорытпалары және т. б. металдарды өңдеу кезінде пайда болатын қалдықтарды шикізат ретінде пайдаланған кезде ең үлкен экономикалық тиімділікке қол жеткізіледі.

Бұл жұмыста ұсақтау шарикті дірілде жүргізілді FRITSCH PULVERISETTE 0 диірмені, өйткені діріл диірмендері, материалдардың тез және ұсақ ұнтақталуын қамтамасыз етеді. Бұған қол жеткізілді корпустың қабырғаларынан жиі импульстарды мазмұнға беру арқылы диірмендер (ұнтақталған денелер және ұсақталған материал). Үлкен сан уақыт бірлігінде ұнтақтайтын денелер қабылдайтын импульстар және олардың күрделі қозғалыс олардың ұсақталған әсерінің сипатын анықтайды материал. Ұнтақталған денелер лақтырылады, соқтығысады, айналады және диірменнің қабырғалары бойымен сырғып, ұсақталған бөлшектерге әсер етеді әр түрлі бағыттағы диірменнің барлық аймақтарындағы материал, айнымалы шаманың қысу және кесу күштері.

Жеке ұнтақтау денесінің соққы импульсі кәдімгі шар диірменінде салыстырмалы түрде аз. Алайда Үлкен сан көлем бірлігінде ұнтақтау денелері және жоғары діріл жиілігі қамтамасыз етеді өңделетін материалды қарқынды ұнтақтау және араластыру.

Зерттеудің тиімді әдістерінің бірі белгілі материалтану болып табылады. Электронды микроскопия,жоғары ажыратымдылықтағы кескіндерді алуға мүмкіндік береді (дейін~ 1 Å дейін) және фазалық құрамын, кристалдық құрылымын анықтаңыз микродифракциялық суреттердің арқасында зерттелетін материал рентгендік шашырау кезіндегі суреттерге ұқсас электрондардың шашырауы сәулелер.

Соңғы кезең-ультрадыбыстық ваннада жүзеге асырылатын этил спиртін қолдана отырып, үлгілерді жуу және тазарту. Тазалап, ауада кептіргеннен кейін үлгілер эксикаторда сақталды. Тегістеу және жылтырату процесінде үлгілердің бетінің сапасын бақылау Olympus BX4LM оптикалық микроскопында жүргізілді. Ұшқын плазмалық пісіру әдісі арқылы көлемдік үлгілердің элементтік және фазалық құрамы бойынша өзгеруі зерттелді.

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Determining the potential of Georgia's shelter preparation based on qualitative research

Maya Chanturia
Professor, Georgian Technical University
Levan Macaberidze
PhD, Georgian Technical University

Keywords: shelter, air raid, bunker, defense;
Abstract: For the population of the conflict regions of Georgia, it is necessary to know about the arrangement of shelters and their location, and we should also know about the location of shelters in other cities of Georgia. There are networks of underground buildings and tunnels in Tbilisi, including the metro, which can be used as a shelter.

1. Introduction

Our country is located at the ancient transport crossroads that connected and connected the countries of the North and South, West and East. Accordingly, Georgia is a ring whose conquest was in the interests of the neighboring states, and there are many examples of this in the history of Georgia. Since Georgia often becomes an object of attack, the defense forces of our country must improve both the theoretical and practical parts of the military-engineering arrangement of the territory. Based on all of the above, the military-engineering arrangement of the territory determines the degree of ability to fight against the enemy's superior forces and the protection of the civilian population from the powerful firepower of the enemy. If we look at the recent history of our country, we will find that there is no evidence of the creation of obstacles by our country's defense forces, which in turn shows that we have a lot of work to do in this direction. In the future, the research aims to use the existing buildings and structures as shelters throughout Georgia, as well as natural resources, in particular, "caves, caves", to select them, which will further protect the civilian population from the enemy's powerful weapons.[1,2]

2. Discussion

The purpose of the research discussed here was to study accurate information from citizens living in conflict regions about the role of shelters in terms of their security. To collect information, interviews were conducted with the population living in the city of Tbilisi, as well as in the city of Gori (East, Tbilisi city 30 (thirty) local citizens, Gori city 30 (thirty) citizens, West - 80 (eighty) citizens, Zugdidi city).

I interviewed about 30 (thirty) citizens in the capital of Georgia, Tbilisi, in the settlements of the airport and Makhati mountain, where during the war of August 2008, they were bombed by enemy aircraft. About 15 (fifteen) citizens of Klak Gori district, namely Mejvriskhevi, were interviewed, and 15 (fifteen) citizens living in the city of Gori were also interviewed. In the west, Zugdidi district, village Khurcha 20 (twenty) citizens, Shamgona 20 (twenty) citizens, Tagilon 20 (twenty) citizens, and Zugdidi city residents 20 (twenty) citizens, a total of 80 (eighty) citizens, open-ended questions were asked by me.

1. Are you in favor of organizing shelters near settlements?
2. Did you use shelters during the August 2008 war?

3. During the war, what was the threat to the civilian population due to the lack of shelters? 4. During the August 2008 war, were there any accidents due to the lack of shelters?
5. Do (residents of Tbilisi, Gori, and Zugdidi) want to organize shelters in advance and know their location?
6. How safe will the "basements" in the building be if you use them as shelters?

Based on the analysis of the responses of the population participating in the survey, it shows that:
• 100% of respondents are willing to organize shelters in settlements and express their opinion that it would be good if they were informed about their location in advance.

• 100% of the respondents confirm that during the August 2008 war and other conflicts, they did not and never used shelters because they did not know their whereabouts.

• 100% of the respondents confirm that due to the lack of shelters during the August 2008 war, the level of danger to the civilian population was high.

• 100% of the respondents confirm that due to the lack of shelters, during the war of August 2008, there were many victims of the civilian population as well as military personnel during the aerial bombardment.

• 100% of the respondents confirm that in those conflict cities and regions where the enemy's military aggression is high, it is necessary to organize shelters in residential areas in advance, to equip them accordingly, and to inform the population about this in advance.

• 70% of the respondents confirm that the "basements" in the buildings are safe for the first stage, while 30% think they may be less safe, although it is necessary to place shelters in terms of primary security for the population.

To find out the mentioned issue, I visited the citizens living near the conflict regions, in particular the inhabitants of the city of Gori. According to them, there have been many confrontations between Georgians and Os separatists, but when Russia invaded Georgia on August 8, 2008, it was a massive bombing against the civilian population. I talked to one of the citizens living in the city of Gori, a war veteran and reserve lieutenant colonel Zviad Beruashvili, he told us that unfortunately, the residents of this area did not know about the arrangement and use of shelters beforehand. They note that, of course, I should have prepared and informed the population about shelters or their arrangement, so there would have been fewer victims. The aggravation of the situation started already in the spring of 2008, it was not difficult to understand that the war would start, because Georgian villages were massively bombed. Before that, they used hybrid warfare tactics like:
♣ information operations;
♣ trade and economic blackmail;
♣ Passportization in the occupied territories.
It was mentioned that the beginning of the war would be inevitable. According to Reserve Colonel Zviad Beruashvili, there are several Soviet-era shelters in the Gori district, but, as in other districts and cities, they have been looted and damaged, which are useless as shelters. According to him, we should learn from the mistakes of the past, and in the future, the population living in the conflict region should be more protected. To explain in detail what Deputy Colonel of the Defense Forces Mr. Zviad Beruashvili meant in this matter, we asked him several open-ended questions:

1. In advance, what measures should be taken to protect the safety of the population living in the conflict region during an air strike?
2. In advance, what kind of training should people living near the conflict region undergo to protect themselves from air, artillery and other threats?
3. Is it necessary to prepare shelters in advance to avoid expected threats?
4. What type of measures should be taken to arrange shelters for use?
5. Should the civilian population living near the conflict region know in advance about evacuation and shelter plans?

Based on the analysis of the responses of Mr. Zviad Beruashvili, the reserve lieutenant colonel of the Defense Forces, who participated in the survey, it shows that: o There is a need for more involvement of government agencies in this matter to ensure the protection of the civilian population.

o Most importantly it is necessary to implement an interagency approach in a complex manner, in particular by the National Guard of the Defense Forces, the Rescue of the Ministry of Internal Affairs, the Medical and Local Municipalities, City Hall, and Boards of the Ministry of Health.

o They should restore and repair the old shelters.

o The local population should be actively involved in this matter.

o Restored shelters should be filled with all the necessary facilities, medicines, food, and drinking water, if there are no shelters of this type in the region, they must be organized in public gathering places, near schools and kindergartens, as well as calculate the number of people living in the conflict zone and build the required number of shelters.

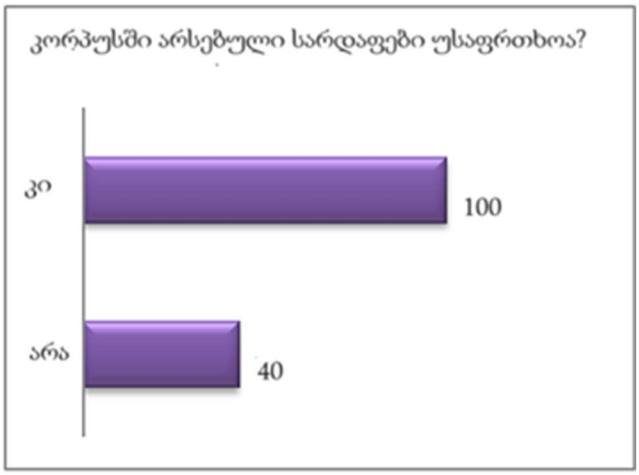
o It is good if we take the examples of other countries to increase the security of people living in conflict regions.

o The population of our country should be given the kind of training that is carried out, for example, in Israel, close to dangerous regions, particularly the "Gaza" sector. And to carry out appropriate training, such as the time required to get to the shelters, how long it takes to get to the shelters, if the alarm signal is activated, the rules of behavior on the spot, as well as how to use the shelters during a natural disaster. Educational training must be conducted from a medical point of view as well, citizens must know how to find first aid and be sure what things to take to the shelters, what is most important and important, to know their location so that they can take shelter in time to avoid different types of threats.

o preparation and setting up shelters is the best option to increase the safety of the population. They will have the appropriate supplies prepared in advance. Adequate protection of residents will be provided in case of both war and separatist attacks.

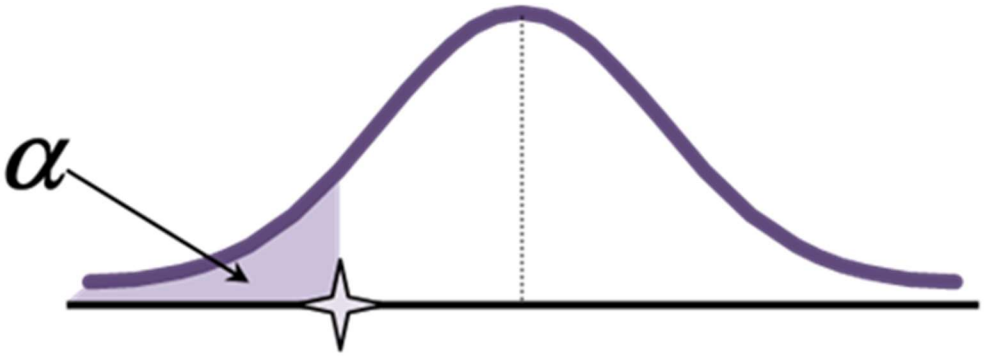
My qualitative research has shown that the selection, arrangement, and informing of the population about shelters is necessary in the above-mentioned regions and cities. Most of the interviewees in the capital do not even know about the existence of shelters. If there are buildings of this type in their neighborhoods, which protect the population during air raids and natural disasters. I also focused on the population living in conflict regions, namely in Gori and Zugdidi regions. Residents of this district claim that the conflict has been going on for the last 30 years, villages have been shelled by artillery and other types of shells by the separatists, but they have not heard anything about the shelters, nor do they know about their arrangement and use. As mentioned above, a qualitative study was conducted to determine the potential of preparing shelters. Citizens were interviewed both in Tbilisi and in Gori and Zugdidi regions according to a previously prepared questionnaire. 30 citizens were interviewed by qualitative method in Tbilisi, 30 citizens in Gori district, and 80 citizens in Zugdidi district, a total of 140. 100% of the respondents gave a positive answer to the first five questions, and 70% to the sixth question "How safe would it be to use the "cellars" in the building as shelters?" confirms that the vaults may be safe for the first stage, while the remaining 30% are skeptical.

To make it possible to generalize this study to the entire set of interviewed persons (hereinafter referred to as the population), we tested the hypotheses of the above study. Since the number of respondents exceeds 30, the sample can be assumed to be normally distributed and the hypothesis can be tested using a Z-table. Two types of errors occur during hypothesis testing: A type I error occurs when the null hypothesis is true, but testing shows that it is not true and it is rejected. A type II error is when the null hypothesis is not rejected, but it is not correct. In the case of both errors, attention is paid to α. If it is quite small, the probability of the second type of error is high, any value of the null hypothesis falls into the confidence interval, and if the value of α is high, the probability of the first type of error increases, the value of the correct hypothesis falls outside the confidence interval, because This interval is small. In this case, the value of α is 0.05, which is recommended for statistical research, usually its values are 0.01, 0.05, and 0.1. First of all, statistical indicators were calculated:



Mean	2.94
Standard Error	0.20
Median	3.50
Mode	-
Standard Deviation	2.41
Sample Variance	5.82
Kurtosis	(1.60)
Skewness	(0.11)
Range	6.00
Minimum	-
Maximum	6.00
Sum	441.00
Count	140.00

Hypothesis: On average for the total population, "basements in buildings are not safe" and give it a score of 3.5 or less.



$H_0 \geq 3.4$ $H_1 < 3.4$ $\alpha=0.05=$ -1.65 $Z=-2.34$ $Z < \alpha$:

Since the null hypothesis is not correct and the value of α is quite small, we are dealing with the second type of error, the hypothesis is not rejected. Thus, it is possible to generalize this research to the entire population (all residents). We do not check the first five questions because we are dealing with 100% confirmation.

3. Conclusion

My qualitative research has shown that the selection, arrangement, and informing of the population about shelters is necessary in the above-mentioned regions and cities.

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MAŞIN ÖYRƏNMƏSİNİN SƏNAYƏ İDARƏETMƏ SİSTEMLƏRİNİN TƏHLÜKƏSİZLİYİNDƏ İSTİFADƏSİ

Rüstəmov Aslan Sənan oğlu
Azərbaycan Texniki Universiteti, Bakı, Azərbaycan

Xülasə. Sənaye İdarəetmə Sistemlərinə (SİS) qarşı uğurlu hücumların sayının tədricən artması nəticəsində yaranan proses anomaliyalarının dəqiq və vaxtında aşkar edilməsi üçün müdafiə mexanizmlərinin yaradılmasına ehtiyac yaranmışdır. Maşın öyrənmə alqoritmlərindən istifadə etməklə bu cür yanaşmalar SİS-də yerləşdirilmiş proses dinamikasını və idarəetmə strategiyalarını avtomatik öyrənə bilər. SİS təhlükəsizliyi üçün AI əsaslı həllərin tətbiqinin əsas üstünlüklərindən biri real vaxt rejimində cavab və fəaliyyətdir. Maşın öyrənməsinə əsaslanan alətlər hadisə baş verdikdə təhlükəsizlik işçilərinin qərar qəbul etməsini gözləməyə ehtiyac duymur. SOC (Təhlükəsizlik Əməliyyatları Mərkəzi) resursu anomaliya barədə xəbərdarlıq edilməmişdən əvvəl onlar istənilməyən hadisələri aşkar edə və təhlükəyə dərhal cavab verə bilirlər. Stabil modellərdən istifadə edildiyi və nümunə məlumatları mümkün qədər müxtəlif olduğu müddətdə aşkarlama xətalarını əhəmiyyətli dərəcədə azaldaraq, bu sistemlərin mövcud sistemlərə gətirdiyi dəqiqliyi vurğulamalıyıq.
Üstünlüklərə baxmayaraq, şəhər miqyaslı zavodlar üçün maşın öyrənməsindən istifadə edərək yaradılan detektorların istifadəsi və yerləşdirilməsində əhəmiyyətli çətinliklər və tətbiqi problemləri mövcuddur
Açar sözlər: *Maşın Öyrənməsi, SCADA, SİS, SOC, Süni İntellekt*

THE USAGE OF MACHINE LEARNING IN SECURITY OF INDUSTRIAL CONTROL SYSTEMS

Rustamov Aslan Sanan
Azerbaijan Technical University, Baku, Azerbaijan

Summary. As a result of the increasing number of successful attacks against Industrial Control Systems (SIS), there is an urgent need to establish mechanisms for accurate and timely detection of process anomalies. Using machine learning algorithms, such approaches can automatically learn process dynamSIS and control strategies embedded in a ICS. One of the key benefits of implementing AI-based solutions for ICS security is real-time response and action. Machine learning-based tools do not require the use of security personnel's decision-making when an incident occurs. A SOC (Security Operations Center) resource can detect unwanted events and respond to threats long before an anomaly occurs. The use and usage of stable models should emphasize the accuracy these systems bring to existing systems, taking into account detection errors as much as possible.

Despite the advantages, there are challenges in building and installing machine controls and applications that can be used for urban-scale plants.
Keywords: *Machine Learning, SCADA, SIS, SOC, Artifical Intelligence*

Giriş: Maşın öyrənmə konsepti, tamamilə avtomatik şəkildə qərarlar verməyə, mümkün ehtimalları sinifləndirməyə və ya yeni məlumatlar yaratmağa fokuslanmış bir sistem və ya tətbiq proqramlama metodudur. Bütün bunlar, müşahidə olunan sistemlər və şəbəkələr tərəfindən təmin edilən məlumat kimi bəzi giriş elementlərinə əsaslanır.[1]

Suni intellekt sahəsində ən çox danışılan alqoritmik strukturlardan biri olan neyron struktur, daha yaxşı bilinən adı isə neyron şəbəkədir. Bu şəbəkə beyin neyronlarının iş prinsipini təqlid edən bir əməliyyatdır. Hər iterasiyada şəbəkə bir referans ilə müqayisə edilən bir giriş əsasında bir cavab verir. Beləliklə, cavabının və həqiqi cavabın arasındakı səhv ölçülərək, şəbəkə hər iterasiyada daha yaxşı bir cavab vermək üçün bağlantılarını tənzimləyə bilir. Bu şəbəkələrin təlim edildiyi alqoritmlər bir neçə növə bölünə bilər:

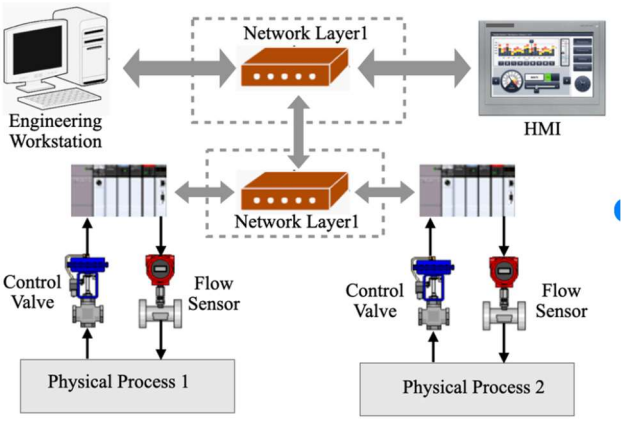
Nəzarətli - Supervised (bütün işarələnmiş təlim məlumatları): bir insanın şəbəkəyə təlim məlumatları təqdim etməsini tələb edir. Bu qrupda, çox sayda mövcud klassifikatorlar, məsələn, spam aşkarlayıcılar, qərar ağacları, Naïve Bayes sinifləndirməsi, Dəstək Vektor Maşınları (SVM) kimi alqoritmlər yer ala bilər. Bu növ alqoritmlər sinifləndirmə (rəqəm tanıma, şəxslərin kimliyi qadağanı aşkarlanması, diagnostika...) və regressiya (hava proqnozu, yaşam müddəti, növ...) problemlərində istifadə olunur.

Nəzarətsiz (işarələnmiş təlim məlumatları yoxdur): şəbəkə özü səhv etdiyini anlayır və buna uyğun öyrənir. Bu üsul ümumilikdə segmentasiya və tövsiyələr üçün istifadə olunur, çünki fərqli nümunələri ayırmaq və müstəqil komponent analizi daha asandır.

Yarı nəzarətli: Giriş-çıxış uyğunluğu və müvafiq çıxış olmadan girişlər arasında qarışıq təmin edilir. Əsasən bütün uyğunluqlar mövcud olmadıqda istifadə olunur, lakin böyük miqdarda etiketlənməmiş data ilə birlikdə az miqdarda etiketlənmiş məlumat mövcuddur. Bu öyrənmə metodu bütün təlim nümunələrinin miqdarına və ya mürəkkəbliyinə görə etiketlənmənin qeyri-mümkün olduğu vəziyyətlərdə çox faydalıdır, buna görə də bir neçəsi etiketlənir, qalanları isə neyron şəbəkəsinin ixtiyarına verilir.[3]

Sənaye Nəzarət Sistemləri (sis), su təmizləmə təsərrüfatları, neft qazı ehtiyatları, enerji şəbəkələri, nüvə və termal enerji mənzilləri kimi əhəmiyyətli infrastrukturların bir hissəsidir. SİS, fiziki prosesi nəzarət etmək üçün kompüterləşmə və kommunikasiya komponentlərinin birləşdirilməsi ilə əldə edilən bir sistemə istinad edir. Bir SİS sensorlar, tətikləyicilər, Proqramlanabilən Məntiq Nəzarətçiləri (PLC'ler), İnsan-Maşın İnterfeysləri (İMİ) və Birbaşa Nəzarət və Məlumat Toplama (BNMT) sistemləri kimi cihaz və alt sistemlərdən ibarət olur.

Bir SİS-nin abstrakt görünüşü Şək. 1-də göstərilir. Sahə cihazları, yəni fiziki təbəqədə sensorlar və tətikləyicilər, aşağıda yerləşən sənaye prosesini izləyir və nəzarət edir. Prosesin hazırkı vəziyyəti sensorlar vasitəsilə nümunələnir və müntəzəm nəzarət qatında PLC-lərə ünvanlanır. PLC-lər nəzarət yollarını yaradır və bunları borular, valflər, generatorlar və dövrə qoymalar kimi tətikləyicilərə köçürür. Digər cihazlar, supervizor nəzarət qatında SCADA və İMİ kimi, bir zavod operatoru ilə PLC-lər arasında insan-təsirli nəzarət əməllərinin həyata keçirilməsi üçün kommunikasiyanı təmin edir.[2]



Şəkil 1.

Maşın Öyrənməsinin SİS-də indiki vəziyyəti. SİS üçün ən müasir ML yanaşmaları ilə kiçik kiberhücumların qarşısını almaq olar. Amma verilənlər bazası və onların performans nəticələri istifadə olunan məlumatların çox olmaması səbəbindən zəif ola bilər. Sadalanan demək olar ki, bütün ML alqoritmləri SIS-də ən çox yayılmış kiberhücumlardan biri olan FDI hücumu üzrə qiymətləndirilib. [4]

Maşın öyrənməsinin köməyi ilə SİS-də müdafiə sisteminin qurulması üçün əsas 2 komponentə ehtiyac vardır:

1. Maşın Öyrənməsi Alqoritmi – daxil edilmiş məlumatlardan ‘öyrənən’ və 'öyrənilmiş' məlumatı bir modeldə saxlayan alqoritm. Model daha sonra təsnifat, proqnozlaşdırma və ya qruplaşdırma tapşırıqları üçün istifadə olunacaq.
2. Verilənlər Toplusu - modeli qurmaq və öyrətmək üçün istifadə olunan verilənlər toplusu.

Məlumat adətən həm sıradan, həm də hücum nümunələrindən ibarətdir. O, həmçinin bu modellərin nə qədər effektiv olduğunu və performansını qiymətləndirmək üçündə istifadə olunacaq.

ML alqoritmləri arasında DT əsaslı alqoritmlər və DNN əsaslı alqoritmlər kiberhücumların aşkar edilməsində ən yaxşı nəticələri təmin edir. Bununla belə, bu nəticələr yalnız mövcud məlumatın məhdud seçiminə əsaslanır və əsasən alqoritmlərin dəqiqliyi, geri çağırılması və F1 balına görə ölçülür. Zamana əsaslanan ölçmələr (məsələn, təlim vaxtı) qiymətləndirmənin bir hissəsi kimi çətin istifadə olunur, lakin bu ölçmələr kritik infrastrukturda real vaxt aşkarlanması üçün və onların uyğunluğunu müəyyən etmək üçün vacibdir. Buna görə də, real dünya mühitində istehsala qoyula bilən güclü ML alqoritmlərini inkişaf etdirmək üçün müxtəlif növ İCS mühiti və ssenariləri üzrə daha əhatəli qiymətləndirmə tələb olunacaq.[6]

SİS təhlükəsizliyi üçün Maşın Öyrənməsində bəzi problemlər.

Qiymətləndirmə üçün məhdud hücum senariləri: Kritik infrastrukturda SİS-lərə kiber hücumlar son dərəcə zərərverici olsa da, onlara yönəlmiş və xüsusi hücumlar çox yayğın deyil. Ən tanınmış hücumlar Stuxnet, BlackEnergy, Trisis, Havex və ya Crashoverride köməkli viruslarının növləridir. Bu viruslar özəlliklə müəyyən mühitlərdə olub, məsələn, Stuxnet hadisəsində İranın uran zənginləşdirmə zavoduna və ya BlackEnergy hadisəsində Ukraynanın enerji şəbəkəsinə hücum olunub. Bu hədəflənmiş hücumlarla yanaşı, bəzi hücumlar ransomware kimi təsnif edilə bilər. Bu vəziyyət kiberhücumların (məsələn, zərərli proqram) nümunələrinin böyük olduğu və əhəmiyyətli müxtəlifliyə malik olduğu ümumi İT infrastrukturlarından tamamilə fərqlidir.[5]

Məhdud, yaxşı keyfiyyətli, real verilənlər toplusu: Təlim, sınaq və qiymətləndirmə üçün istifadə olunan mövcud verilənlər toplusu köhnəlmiş və reallığı artıq əks etdirmir. Bu verilənlər toplusu sayəsində yalnız KDDCup’99 kiber hücumuna və NSL-KDD (Tavallaee et al., 2009)

verilənlər toplusuna əsaslanır. Hər iki verilənlər toplusui zəif tərəflərinə baxmayaraq hələ də istifadə olunur. Məsələn, KDD verilənlər bazası gərək olmayan qeydlərə, itirilimiş qiymətə və əvvələr baş vermiş və indi aktuallığını itirən hücumlara görə tənqid edilmişdir. Onun davamçısı olan NSL-KDD bəzi lazımsız məlumatları silsə də, hələ də eyni köhnə hücumları təsvir edir.Bundan əlavə, Mississippi Dövlət Universitetinin (MSU) Enerji, Qaz və Su verilənlər toplusuləri (Morris, 2018) və Sinqapur Texnologiya və Dizayn Universitetinin Təhlükəsiz Su Təmizləmə (SWaT) verilənlər toplusui (Goh və digərləri, 2016) kimi ICS tədqiqatı üçün daha yeni verilənlər dəstləri təqdim edilmişdir. Bununla belə, bu verilənlər toplusu aşkarlanma əməliyyatı üçün mövcud olan kiberhücum növlərini məhdudlaşdıran öz SİS mühitində xüsusi parametrlərdən və ya protokollardan məlumatları alır.[8] Üstəlik, bu verilənlər toplu kiberhücumların əksəriyyəti hakerların sistemə və ya şəbəkəyə giriş və nəzarət əldə etdiyi fərziyyəsinə əsaslanır ki, bu da kiberhücumun nə qədər erkən aşkarlanacağını məhdudlaşdırır. Məhdud keyfiyyətli verilənlər toplusu, xüsusən də reallığa uyğun gəlməyən verilənlər bazası üçün əsas problem verilənlər anonimləşdirildikdən sonra belə verilənlər bazasında həssas məlumatların açıq qalması riskidir. Buna görə də, demək olar ki, heç kim öz verilənlər toplusunu sistemlərdə açıq şəkildə paylaşmaz.[10]

Rəqiblərin hücum riski: ML yanaşmaları təsirli olması üçün təlim məlumatlarının düzgünlüyünə və dəqiqliyinə və əvvəlcədən hazırlanmış modellərə əsaslanır. Bununla belə, bu cür yanaşmanın əsas zəif tərəfi ondan ibarətdir ki, o, hakerlara aşkarlanmadan yayınmaq üçün bu təlim məlumatlarından və əvvəlcədən öyrədilmiş modellərdən istifadə etmək imkanları verir və yanaşmaların effektivliyini azaldır. Kibertəhlükəsizlikdə düşmən hücumu on ildən artıqdır ki, tanınmış problem olsa da (Biggio & Roli, 2018), kibertəhlükəsizlik üçün ML yanaşmalarının artması səbəbindən bu, yalnız son illərdə daha qabarıq hala gəldi. Düşmən hücumları kiberhücumlardan fərqlənir, çünki onlar kiber infrastruktura hücum etməkdənsə, ML modellərini səhv təsnifatda çaşdırmaq məqsədi daşıyırlar.[7]

Yuxarıdakı çətinliklərin öhdəsindən gəlmək üçün aşağıdakı bəzi üsullardan istifadə etmək olar. **Nəzarətsiz, dərin öyrənmə metodlarına diqqət yetirən daha çox araşdırma**. Ədəbiyyatın böyük həcmi nəzarət olunan öyrənmə alqoritmlərini qiymətləndirmişdir. Bununla belə, bu tip yanaşmalar əsasən etiketlənmiş verilənlər bazasına əsaslanır. SİS təhlükəsizliyi kontekstində, etiketlənmiş məlumat dəstlərindən asılılığı azaltmaq üçün digər yanaşmaların, xüsusən nəzarətsiz öyrənmə və ya yarı nəzarətli öyrənmənin tədqiqi üçün daha çox diqqət tələb olunur. **Təkcə dəqiqliyə diqqət yetirməkdənsə, yanaşmanın praktiki tətbiqinə daha çox diqqət yetirmək** Hazırda dəqiq ML modellərinin qurulmasına güclü diqqət yetirilir, lakin yanaşmanın özünün faktiki tətbiqi üçün heç bir səy yoxdur. Bəzi verilənlər toplusunda birdən çox mənbədən alınan məlumatlar əl ilə birləşdirilir və vahid verilənlər bazasına çevrilir. Real dünya nümunələrində, hücumun aşkarlanmasının vaxtında azaldılması və daha yaxşı hesablama resurslarının idarə edilməsini təmin etmək üçün onlayn olmalıdır. Buna görə də, oxşar performansa nail olmaq üçün məlumatların onlayn rejimdə toplanması üçün bu cür ML yanaşmalarını harada və necə tətbiq edəcəyimizi də nəzərdən keçirməliyik.

Qiymətləndirmə yalnız dəqiqlik ölçülərini deyil, miqyaslılığı, vaxt və emal xərclərini və etibarlılığı da əhatə etməlidir. Tədqiqatçılar əsasən öz yanaşmalarını yalnız dəqiqlik, F1-balı, geri çağırma və s. kimi dəqiqliyə əsaslanan metriklərdən istifadə edərək qiymətləndirirlər, bu da uyğunluğu müəyyən etmək üçün kifayət etməyə bilər. Bunun səbəbi, bu yanaşmaların yavaş ola biləcəyi və ya verilənləri emal edərkən yüksək emal imkanları tələb etməsidir. Vaxt və emal xərcləri kimi digər amillərin daxil edilməsi yanaşmanın ümumi performansını daha yaxşı başa düşməyə imkan verəcək.[2]

Nəticə. Ümumi olaraq, bu çətinliklər Maşın Öyrənməsinin SİS təhlükəsizliyinin tətbiqində bir böyük problemə gətirib çıxarır. Bu yanaşmaların performansı real hücumlar və verilənlər toplusunda olan məhdudiyyət səbəbindən heç vaxt real olaraq qiymətləndirilə bilməz. Üstəlik, bu yanaşmaları ölçmək üçün standartlaşdırılmış performans göstəricilərida yoxdur. Buna görə sənaye üçün bu

yanaşma sistemlərini qəbul etmək çətindir. Aydındır ki, nəinki daha effektiv və miqyaslana bilən ML əsaslı kiberhücum detektorunu inkişaf etdirmək, həm də bu yeni alətlərin real dünyada etibarlılığını artırmaq üçün bu problemlərin həllinə mütləq ehtiyac var.

Sənaye İdarəetmə Sistemləri kimi kritik infrastrukturda anomaliya detektorlarının dizaynı üçün maşın öyrənməsindən istifadənin artmasının şahidi oluruq. Maşın öyrənməsindən istifadə dizayn mərkəzli yanaşmalarla müqayisədə detektorların nisbətən sürətli yaradılmasına imkan versə də, onların öz çətinlikləri də var. Bu çətinliklərin bir neçə belə problem bu məqalədə ümumiləşdirilmişdir. Heç bir şübhə yoxdur ki, SIS-də kibertəhlükələrin sayı, eləcə də onların mürəkkəbliyi ildən-ilə əhəmiyyətli dərəcədə artır. Buna görə də, texnoloji tərəqqilərin bu artımı müşayiət etməsi, hazırda tətbiq olunan əks tədbirləri təkmilləşdirməsi vacibdir. Maşın öyrənməsi bunun perspektivli nümunəsidir və mövcud sistemlərlə müqayisədə aydın üstünlüklər təqdim edir. Buna baxmayaraq, mümkün qədər çox sənaye istifadə vəziyyətində effektiv olması üçün bu sahədə daha böyük irəliləyişlərə ehtiyac var.

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The Impact of Artificial Intelligence Integration in Kazakhstan's Manufacturing Sector

Kakimov Bakhtiyar Kuanyshuly
1st year undergraduate student, Department of Management, L.N. Gumilyov Eurasian National University, Kazakhstan, Astana

Abstract

The integration of Artificial Intelligence (AI) in the manufacturing sector marks a critical step forward in Kazakhstan's industrial and economic evolution. This paper explores the impact, extent, and future prospects of AI adoption within Kazakhstan's manufacturing landscape, underpinned by initiatives like "Digital Kazakhstan." The study highlights the potential for efficiency gains, economic growth, and enhanced competitiveness through strategic AI integration, aligning with national goals for economic diversification and innovation. It addresses the challenges faced, including the need for substantial technological investments, workforce adaptation to new technologies, and the imperative for educational and policy reforms to support this transition. The findings suggest that while integrating AI into manufacturing processes promises significant benefits such as improved productivity, economic diversification, and a reduced environmental footprint, realizing these benefits demands a coordinated approach involving substantial investment in technology infrastructure, an overhaul of the educational system to produce a workforce proficient in AI and related technologies, and robust policy reforms to foster an innovation-friendly environment. The paper concludes that despite the complexities involved, the rewards of industrial modernization, sustainable development, and economic resilience are profound, positioning Kazakhstan as a potential leader in technological innovation and digital transformation within the manufacturing sector.

Keywords: *Artificial Intelligence, manufacturing, Kazakhstan, digital transformation, economic diversification, technology investment, workforce adaptation, educational reform, policy reform, sustainable development.*

Introduction

The onset of the Fourth Industrial Revolution has spurred the integration of Artificial Intelligence (AI) in manufacturing, heralding efficiency gains and economic growth (Schwab and World Economic Forum, 2016). Kazakhstan, amidst its industrial and digital transformation initiatives, such as the "Digital Kazakhstan" program, stands as a prime candidate for examining AI's role in manufacturing (EGOV, 2024). This integration aligns with the nation's goals for economic diversification and innovation, promising enhanced productivity and competitiveness. However, it also brings forth challenges like workforce adaptation and the necessity for significant technological investments (WEF, 2020). This paper aims to scrutinize the extent, impacts, and future prospects of AI adoption in Kazakhstan's manufacturing sector, offering insights into the strategies and hurdles encountered in this digital evolution.

Literature review

The global manufacturing landscape is increasingly being defined by the adoption of AI technologies, which promise to enhance operational efficiency, reduce costs, and improve

product quality. AI applications, ranging from predictive maintenance and quality control to demand forecasting and customization, are enabling manufacturers to achieve unprecedented levels of precision and flexibility (Bughin et al., 2017; Schwab, 2016).

Predictive maintenance, one of the most significant applications of AI in manufacturing, utilizes machine learning algorithms to predict equipment failures before they occur, thereby reducing downtime and maintenance costs (Lee et al., 2014). This application not only optimizes manufacturing operations but also extends the lifespan of machinery, contributing to substantial cost savings for companies.

AI-driven quality control systems are another transformative application, employing computer vision and machine learning to detect defects with greater accuracy than human inspectors. Such systems enhance product quality and consistency, critical factors in maintaining competitive advantage in the global market (Zheng et al., 2019).

Furthermore, AI's role in demand forecasting and supply chain optimization offers a strategic advantage by enabling more accurate predictions of market demands, thus reducing inventory costs and improving customer satisfaction (Ransbotham et al., 2017).

However, the integration of AI in manufacturing also presents challenges, including the need for significant investment in technology infrastructure, concerns over data privacy and security, and the potential impact on employment due to automation (WEF, 2020). Addressing these challenges requires concerted efforts from policymakers, educators, and industry leaders to foster an environment conducive to sustainable AI adoption.

Kazakhstan's commitment to enhancing its manufacturing sector through digital technologies is part of a broader national strategy aimed at diversifying the economy and reducing dependency on oil and gas revenues. The "Digital Kazakhstan" program, launched by the government, underscores this commitment by promoting the adoption of digital technologies across various sectors, including manufacturing (EGOV, 2024).

Recent studies indicate that AI adoption in Kazakhstan's manufacturing sector is still in the nascent stages, with significant potential for growth and development. Key areas of focus include smart automation, predictive maintenance, and the integration of IoT (Internet of Things) devices to enhance production efficiency and reduce operational costs (Daribay et al., 2019).

One of the notable initiatives is the development of industrial parks and special economic zones equipped with state-of-the-art digital infrastructure to support AI and IoT applications in manufacturing. These zones offer a conducive environment for pilot projects and collaborations between local manufacturers and international tech companies (Zhanat Zakiyeva, 2020).

Despite these advancements, challenges remain, including the need for skilled labor capable of working with AI technologies, regulatory hurdles, and the high cost of implementing AI solutions. Addressing these challenges is crucial for accelerating AI adoption and leveraging its full potential to transform Kazakhstan's manufacturing sector (Turkyilmaz et al., 2021).

Findings:

The integration of AI in manufacturing processes has revolutionized the way enterprises operate in Kazakhstan. Through the use of AI-driven analytics and robotics, companies have been able to streamline operations, minimize human errors, and significantly boost production rates. For instance, AI algorithms can predict machine failures before they happen, allowing for preemptive maintenance and drastically reducing downtime (Chui et al., 2018). This predictive capacity not only saves costs but also improves the overall lifecycle of machinery. Additionally, AI systems can optimize resource allocation and supply chain logistics, further enhancing operational efficiency and reducing wastage.

The shift towards AI-powered manufacturing necessitates a corresponding transformation in the workforce. As routine and manual tasks become automated, there is a growing demand for skills in programming, machine learning, and data analysis (intel, 2019). This transition

underscores the need for a significant overhaul of the educational system to prepare future workers for the demands of a digitalized economy. Moreover, there's an opportunity for existing workers to upskill, embracing the shift towards more complex and rewarding roles. This evolution towards a knowledge-based workforce can stimulate job creation in high-tech sectors, fostering a more diversified and resilient economy.

AI's role in manufacturing is a powerful catalyst for economic growth and diversification in Kazakhstan. By increasing the efficiency and competitiveness of manufacturing enterprises, AI attracts both domestic and international investments into the sector (World Economic Forum, 2022). This influx of investment not only fuels innovation but also positions Kazakhstan as an attractive destination for high-tech industries, potentially altering the country's economic landscape. Furthermore, by enhancing the quality and competitiveness of Kazakhstani products on the global market, AI integration can contribute to a positive trade balance, supporting the nation's economic sovereignty.

Adopting AI in manufacturing processes aligns with Kazakhstan's environmental goals by promoting energy efficiency and reducing waste. AI-enabled systems can optimize energy use in real-time, significantly lowering the carbon footprint of manufacturing activities (IEA, 2019). For example, AI can enhance material efficiency, ensuring that resources are used more judiciously and waste is minimized. These improvements not only contribute to environmental sustainability but also reduce operational costs, creating a win-win scenario for businesses and the environment alike.

Discussion

The integration of Artificial Intelligence (AI) into Kazakhstan's manufacturing sector marks a pivotal shift towards enhancing efficiency, productivity, and sustainability. This transformation, driven by global trends and national strategies like "Digital Kazakhstan", not only streamlines production through automation and data analytics but also significantly reduces operational costs while increasing output. The evidence suggests that AI's predictive maintenance capabilities and optimization of resource allocation are central to achieving these gains (Chui et al., 2018).

However, the transition to AI-driven manufacturing introduces challenges, particularly in workforce dynamics. As routine tasks become automated, there is an emerging demand for higher-skilled jobs, highlighting the urgent need for educational reforms. These reforms must aim to equip the workforce with technological competencies necessary for the digital age (Sibukele Gumbo et al., 2023). The situation presents a critical juncture for policy, education, and industry collaboration to facilitate a smooth workforce transition, ensuring that educational initiatives align with the emerging needs of the AI-integrated manufacturing landscape.

From an economic perspective, AI's role in manufacturing extends beyond operational improvements to significantly influence competitiveness and foreign investment attraction. By bolstering manufacturing capabilities with AI, Kazakhstan not only diversifies its economy but also enhances its global market position. Nevertheless, realizing these economic benefits is contingent upon overcoming infrastructural and investment challenges in AI technologies, along with establishing supportive regulatory frameworks (WEF, 2021).

AI's integration also aligns with Kazakhstan's environmental objectives by promoting energy efficiency and waste reduction in manufacturing processes. This dual benefit of economic and environmental sustainability underscores the potential of AI to contribute positively to the country's sustainability goals, offering a pathway to reconcile industrial growth with environmental stewardship (IEA, 2019).

As Kazakhstan navigates the complexities of AI integration into its manufacturing sector, it becomes evident that achieving the full potential of this technological advancement requires a multifaceted approach. Addressing the skilled labor gap, fostering a conducive ecosystem for technology adoption, and ensuring alignment between economic strategies and environmental

considerations are crucial. The journey of Kazakhstan reflects the broader challenges and opportunities faced by emerging economies at the nexus of technological innovation and industrial development, offering valuable lessons for other nations on a similar path.

Conclusion

The integration of Artificial Intelligence (AI) into Kazakhstan's manufacturing sector signifies a pivotal advancement towards enhancing the country's industrial capabilities and economic resilience. This transition to a more digitized and efficient manufacturing landscape holds the promise of substantial benefits, including improved productivity, economic diversification, and a sustainable environmental footprint. However, realizing the full potential of AI necessitates a comprehensive and coordinated approach that involves substantial investment in technology infrastructure, a forward-thinking educational system, and robust policy reforms.

Strategic investment in technology infrastructure is essential for laying the groundwork that will enable AI technologies to be seamlessly integrated into manufacturing processes. Such investments not only facilitate the adoption of AI but also ensure that Kazakhstan remains competitive on the global stage. Moreover, the evolution of the workforce towards one that is adept in AI and related technologies calls for an overhaul of the educational system. This involves curricula that are aligned with the demands of a digitized economy, emphasizing STEM subjects, critical thinking, and lifelong learning.

Policy reforms play a crucial role in creating an enabling environment for AI integration. This includes developing policies that encourage innovation, protect data privacy, and ensure that the benefits of AI are widely distributed across society. Additionally, considering the potential of AI to disrupt traditional employment patterns, there is a need for policies that address workforce displacement and promote re-skilling and upskilling initiatives.

The journey towards fully harnessing AI in manufacturing is complex and fraught with challenges. Yet, the potential rewards—economic growth, industrial modernization, and sustainable development—are immense. As Kazakhstan continues to navigate this transition, the experiences and lessons learned can serve as valuable insights for other nations embarking on similar paths. The success of AI integration in Kazakhstan's manufacturing sector will not only redefine its industrial landscape but also position the country as a leader in technological innovation and digital transformation.

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INNOVATIVE WAYS TO CLEAN OIL-CONTAMINATED SOIL

Kapsalyamov B.
L.N. Gumilyov Eurasian National University, Astana, Kazakhstan
Tuyak S.
L.N. Gumilyov Eurasian National University, Astana, Kazakhstan
Kassenova Zh.
Institute of Coal Chemistry and Technology LLP, Astana, Kazakhstan
Yermagambet B.
Institute of Coal Chemistry and Technology LLP, Astana, Kazakhstan
Kazankapova M.
Institute of Coal Chemistry and Technology LLP, Astana, Kazakhstan

Annotation

In the modern world, the development of industrial production is accompanied by an increase in the production and consumption of hydrocarbon raw materials. In this regard, the problem of contamination of soil, surface water, groundwater and other components of the landscape with oil products arises. Oil and petroleum products entering the environment negatively affect all components of the ecosystem. Among the most polluted objects - soil. In the research work-oil-contaminated soils of the western region of the Republic of Kazakhstan were studied and the importance of humic compounds in their purification was determined. According to the first task - the content of harmful heavy metals in the soil samples taken for research was studied. The results of the study of Humate solutions used for the purpose of cleaning contaminated soil – confirmed that their use is able to reduce the content of heavy metals in the soil, which makes them an effective means of recovery. Based on the conducted research and generalized conclusions, innovative approaches have been proposed to purify oil-contaminated soils using potassium, sodium and ammonium humates.

Introduction

Soil is a complex matrix that constantly interacts with other components of the environment, such as water and air, so its pollution - surface and groundwater-is released directly into the air. Soil pollution can be caused by industrial accidents and anthropogenic activities and is a long-term source of environmental pollution. Weak interactions bind soil components to pollutants, which can re-emerge from weak bonds and be released into the environment and affect humans.

The gradually increasing chemical pollution of the environment and especially the soil is one of the most important problems of our time. The main soil pollutants are heavy metals and organic pollutants, including oil and petroleum products. Most of them belong to the first and second classes of danger and are subject to priority control. The soil, which has a unique absorption capacity, collects pollutants, binds them to sedentary compounds and thus performs a protective function in the biosphere, reducing accumulation. Pollutants spread through trophic chains, the primary link of which is plants and the last is man. In addition, excessive accumulation of pollutants in the soil leads to their excess, changes in physicochemical properties and violation

of tread functions. Therefore, the justification of innovative approaches to the purification of oil-contaminated soil, the development of special methods is relevant [1,2].

In the soil, agrophysical and agrochemical properties deteriorate, the acid-base balance changes, the activity of soil enzymes that carry out hydrolysis reactions of complex compounds and catalyze redox reactions decreases, the mobility of nitrogen, phosphorus, potassium and other elements changes. Pollution occurs during oil production, transportation, its storage, processing, refueling cars, pumping tanks to gas stations, as a result of accidents.

New soil recovery technologies emphasize the conversion and detoxification of pollutants. For example, biorecultivation ensures the constant removal of pollutants through on-site recovery at low costs. However, biorecultivation is limited by the correct selection of active microbes, favorable soil conditions for microbial activity, biodegradable resistance of pollutants, and the formation of metabolites that may be more toxic than the original pollutant.

Humic substances found in nature - began to be recognized as possible aids in soil bioremediation methods. Humic substances have been found to reduce the sorption of organic pollutants in soils with impurities of surfactant activity, thus promoting desorption, thereby carrying out the reclamation of dioxins and heavy metals [3,4,5].

Object and methods of research

The object of the study is the soil cover of western Kazakhstan, which belongs to the sulfate - chloride salt-accumulation province. Soil is a unique natural formation that surrounds a number of natural formations characteristic of living and inanimate nature; consists of genetically related horizons formed as a result of changes in the inverted layers of the lithosphere under the joint influence of water, air and organisms.

The task was to prepare initial soil samples, collect soil samples from the western region of Kazakhstan, including after treatment with various solutions of humates and other impurities. Each sample was processed according to the specified option: for example, mixing the soil with a certain percentage of a solution of potassium Humate with nitrogen, iron, NPK or Silicon. Next, an analysis was carried out on the Shimadzu device. To determine the content of heavy metals in soil samples, the atomic absorption analysis method was used. Samples for analysis were prepared according to the protocol for working with the Shimadzu tool, including sample breaking, obtaining atomized metal vapors and analysis using characteristic wavelengths for each metal.

The analysis to determine the percentage of humus in the studied soil samples was carried out according to GOST 26213-2021.

Research results

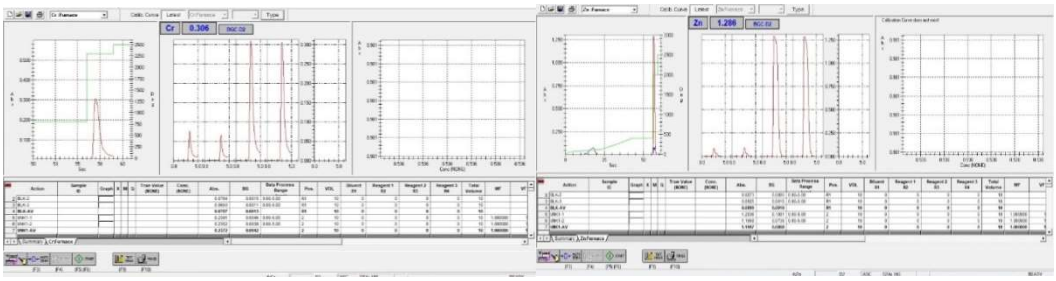
The study of soil pollution by heavy metals in the western region of Kazakhstan using various solutions of humates and other impurities has given valuable results that may be key for the development of effective methods for restoring contaminated soil. To analyze the mobile forms of metals, the acetate-ammonium buffer solution method was used, and then the metals were determined by the atomic absorption analysis method. This method allows you to accurately determine the content of metals in the soil and assess the level of pollution.

The results of the analysis showed that different solutions of humates and other additives have a different effect on the content of heavy metals in the soil. For example, solutions with potassium Humate and nitrogen showed a decrease in metals compared to the initial soil samples, while solutions with potassium and iron Humate, as well as NPK and Silicon, showed different results depending on the concentration and composition.

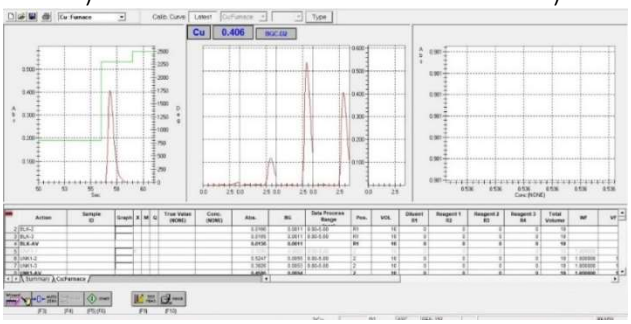
Thus, the results of our study confirm the effectiveness of the use of humates and other additives in the process of restoring contaminated soil. However, for the maximum efficiency of

soil purification and restoration of its ecological balance, it is necessary to conduct additional research to determine the optimal conditions and compositions of solutions.

The images below provide screen data related to the detection of heavy metals in the soil using an atomic absorption spectrophotometer (figure 1,2).

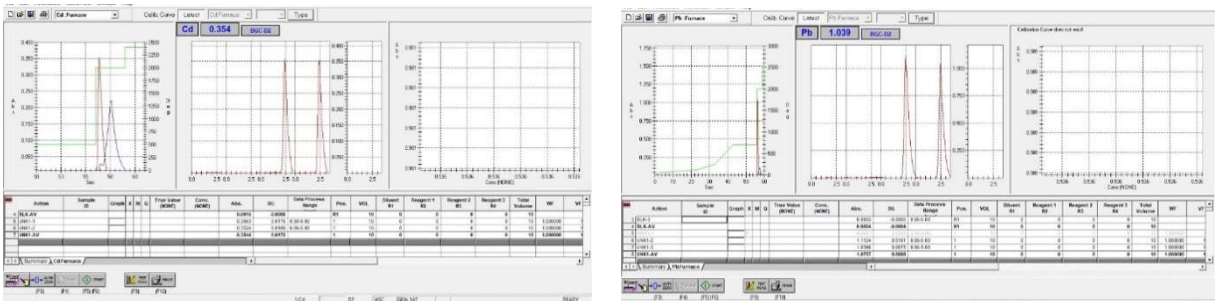


a) b)



c)

Figure 1-the amount of the element under study for the moving shape in the initial soil sample: a - Cr, b - Zn, c - Cu



a) b)

Figure - 2 the amount of the element under study for the general shape in the initial soil sample: a - Cd, b - Pb

First of all, the analysis carried out showed that the content of heavy metals such as Cd and Pb is characteristic of the general shape of the soil, while Cr, Zn and Si metals are more characteristic of the mobile shape. This is very important in determining recovery strategies, as different types of soil may require different ways of destruction and restoration.

As noted, The Tillage was carried out with five different compositions of potassium Humate, i.e. nitrogen, iron, potassium, NPK, silicon and four different concentrations of potassium Humate: 1%, 10%, 30%, 50%. If we compare the results, then it can be seen that the level of heavy metals in the initial soil before processing is high. After treating the soil with potassium Humate, even at a concentration of 1%, there is a decrease in the level of heavy metals. Thus, we note that potassium Humate is the most effective method of soil cultivation, since it is primarily environmentally friendly biological. The table provides information on the concentration of metals in the soil before and after treatment with various solutions.

Table 1-percentage of cleaning from metals in the soil before and after treatment with various solutions

Name of models	Cd	Pb	Cr	Zn	Cu
MPC (mg / kg)	0,5-1	6,0	6,0	23,0	3,0
Primary soil	0,4586	1,0757	0,2372	1,1997	0,4586
Name of models	Percentage of purification from metals in the soil,%				
Soil + 1% potassium Humate + nitrogen solution	99,56	99,76	11,97	2,36	82,38
Soil + 10% potassium Humate + nitrogen solution	99,04	99,68	97,85	91,61	98,43
Soil + 30% potassium Humate + nitrogen solution	98,26	99,16	32,34	84,40	96,97
Soil + 50% potassium Humate + nitrogen solution	99,32	99,67	0,08	83,61	94,66
Soil + 1% potassium Humate + iron solution	99,39	99,70	95,11	82,16	26,14
Soil + 10% potassium Humate + iron solution	100,44	99,54	42,13	3,51	95,62
Soil + 30% potassium Humate + iron solution	99,98	99,91	98,40	97,70	98,95
Soil + 50% potassium Humate + iron solution	100,00	99,85	98,06	84,98	98,21
Soil + 1% Basic potassium Humate solution	99,78	99,37	40,89	82,31	98,21
Soil + 10% basic potassium Humate solution	99,78	99,52	98,31	88,15	99,56
Soil + 30% basic potassium Humate solution	99,65	99,65	99,11	94,63	100,00
Soil + 50% basic potassium Humate solution	100,00	99,81	32,38	90,46	98,23
Soil + 1% solution "potassium Humate +NPK"	99,78	99,83	88,91	6,00	19,39
Soil + 10% potassium Humate + NPK solution	100,00	99,80	78,58	40,80	82,56
Soil + 30% potassium Humate + NPK solution	98,52	99,44	86,30	74,68	96,03
Soil + 50% solution "potassium Humate + NPK"	100,00	99,87	4,89	5,05	96,16
Soil + 1% potassium Humate + Silicon solution	99,69	99,67	97,89	2,46	95,25

Name of models	Cd	Pb	Cr	Zn	Cu
Soil + 10% potassium Humate + Silicon solution	99,63	99,47	96,88	5,85	92,30
Soil + 30% potassium Humate + Silicon solution	99,39	99,37	57,84	4,64	85,83
Soil + 50% potassium Humate + Silicon solution	98,36	99,89	57,84	4,53	85,56

The table is a comparative analysis of the content of various heavy metals (Cd, Pb, Cr, Zn, Cu) in soil samples with maximum permissible concentrations (MPC) in milligrams per kilogram of soil.

The samples include the starting soil and the maximum permissible values expressed in milligrams per kilogram. The metals under consideration are cadmium (Cd), lead (Pb), chromium (Cr), zinc (Zn), copper (Cu).

The MPC for each metal is indicated in the table in the range of values for Cd (0.5-1) and fixed values for Pb (6.0), Cr (6.0), Zn (23.0) and Cu (3.0).

The initial soil is represented by specific values of heavy metal content (in milligrams per kilogram) in soil samples: Cd (0.4586), Pb (1.0757), Cr (0.2372), Zn (1.1997), Cu (0.4586).

There is a significant decrease in the concentration of heavy metals in the soil after treatment with potassium humate solutions. This indicates the effectiveness of humates in the process of soil purification from pollution.

The concentration of heavy metals such as cadmium (Cd), lead (Pb), chromium (Cr), zinc (Zn) and copper (Cu) is significantly reduced when using different concentrations of potassium humate solutions. This indicates a wide range of effects of humates on various heavy metals.

Especially high efficiency is observed when using solutions of potassium humate with the addition of iron (Fe) and silicon (Si). This indicates the synergistic effect of combining potassium humate with other additives that contribute to improving the purification process.

It is important to note that the purification efficiency does not always linearly depend on the concentration of the potassium humate solution. For example, in some cases, an increase in the concentration of the solution does not lead to a further decrease in the concentration of heavy metals or may even cause some increase. This may be due to the peculiarities of the interaction between humates, metals and other soil components.

Soil treatment with potassium humate solutions using various additives (nitrogen, iron, NPK, silicon) offers promising ways for further research and optimization of the purification process, including determining the optimal component ratios and processing conditions.

Thus, the results of the study indicate the potential of potassium humates as an effective tool for cleaning oil-contaminated soils from heavy metals.

The mechanism of soil purification using potassium humate includes several key processes:

As can be seen, potassium humate has chelating properties, that is, the ability to form stable complexes with heavy metals in the soil. This is due to functional groups in the structure of humates, which form coordination bonds with metal ions, ensuring their extraction from soil particles and inactivation. The chelation process is the formation of a chelate complex, which is a structure in which a metal ion (or several ions) is surrounded by organic molecules called ligands. This process plays an important role in many aspects of chemistry, including analytical chemistry, biochemistry, medical chemistry, and ecology.

Chemical reactions occurring during soil purification from heavy metals using potassium humate can be represented as follows:

Potassium humate contains functional groups such as carboxyl (-COOH) and hydroxyl (-OH), which can form complexes with heavy metals. This leads to the formation of metal chelates, which have lower solubility and bioavailability, which reduces their toxicity and promotes their removal from the soil

Thus, the lactation process promotes the formation of stable complexes between heavy metals and organic ligands, which reduces their toxicity and promotes their removal from the soil.

For example, consider the formation of a complex between a lead ion (Pb2+) and a ligand containing a carboxyl group, for example, an amino acid. In soil, potassium humate can act as a ligand, forming chelate complexes with heavy metals such as lead.

An example of the chelation reaction of lead (Pb^{2+}) with potassium humate (K^{+}):

$$Pb^{2+}+HCOOH \rightarrow Pb(HCOO)_2 Pb^{2+}+HCOOH \rightarrow Pb(HCOO)_2$$

Here, the amino acid represented by the formula HCOOHHCOOH acts as a ligand. After the reaction, a complex compound $Pb(HCOO)_2$ is formed, in which the lead ion is surrounded by ligands, forming a stable structure. This complex has a lower solubility and bioavailability, which makes lead less toxic and more accessible for removal from the soil.

Potassium humate also contributes to the dispersion and desorption of metals, reducing their adsorption on the surface of soil particles and making them more accessible for removal from the soil. This process is especially important for metals that are closely related to colloids and humus in the soil.

Potassium humate improves the structure of the soil by increasing its porosity, water permeability and air exchange, which in turn promotes the migration of metals and improves the efficiency of purification processes.

Humates can stimulate microbial activity and biological activity in the soil, which can contribute to the biological degradation and metabolism of heavy metals, accelerating their removal from the soil.

In general, the mechanism of soil purification using potassium humate is multifactorial and includes physico-chemical, biochemical and biological processes that work together to effectively remove heavy metals from the soil and inactivate them.

It follows from the table that potassium humate can also affect the surface properties of soil particles, reducing their adsorption of metals. This occurs due to the formation of complexes between humates and surface active centers on soil particles, which makes metals more mobile and available for removal.

Potassium humate can form complexes not only with metals, but also with other soil components such as mineral particles and organic material. This can contribute to the dissolution and migration of metals in the soil, which accelerates their removal.

Potassium humate can also affect microorganisms in the soil, stimulating their activity and metabolism. This can contribute to the biological degradation of heavy metals and accelerate their removal from the soil.

Attention should be paid to the process of dispersion in the soil, which occurs when solid particles of soil material (for example, clay or loamy particles) separate and disperse into a liquid, forming a colloidal solution. This process can occur under the influence of mechanical mixing, fluid turbulence, or chemical reactions.

An example of the dispersion process may be the dissolution of heavy metal ions from soil particles in water, which leads to the formation of a colloidal solution of heavy metals.

On the other hand, the process of desorption in the soil is the release of previously adsorbed substances from soil particles into solution. This may occur due to changes in environmental conditions, such as changes in pH, temperature, or solvent concentration.

For example, if an increase in pH occurs in the soil, this can lead to the desorption of heavy metal ions that were previously adsorbed on the surface of soil particles. Such ions will become available for movement in solution and can then migrate to water or plants.

Both of these processes, dispersion and desorption, can affect the availability and distribution of toxic substances in the soil environment, which is important for the environmental assessment of soil pollution and the development of methods for their remediation.

Chemical reactions with heavy metals in the soil can be diverse, and they depend on many factors, including the type of metal, its environment, the pH of the medium and the presence of other chemical compounds. Here are some common chemical reactions with some heavy metals:

Adsorption on the surface of soil particles:

Heavy metals can be adsorbed on the surface of soil particles through various chemical interactions. Obviously one of the mechanisms is

$$Pb^{2+} + 2Fe(OH)_3 \rightarrow Pb(OH)_2 + 2Fe^{3+}$$

It is also likely that heavy metals form unalloyed compounds with other elements that may be soluble or insoluble in water.

Heavy metals can form complex compounds with organic or inorganic ligands, which can affect their solubility and mobility.

$$Pb^{2+} + Cl^- \rightarrow PbCl_2 \text{ (lead chloride)}$$

These reactions vary depending on environmental conditions and soil composition.

Humates containing functional groups of carboxylic acids form complex compounds with heavy metals.

$$Pb\text{^}2+ + 2HA \rightarrow [Pb(HA)_2],$$ where HA are humic acids.

This reduces the solubility of heavy metals and prevents their migration in soil waters.

It should not be forgotten that humates compete with heavy metals for active sites on the surface of soil particles, which leads to ion exchange.

$$Cd^2+ + 2NaHA \rightarrow Cd(HA)_2 + 2Na^+$$

As a result of this process, heavy metal ions are fixed in the soil.

Under the action of humates, dispersion and desorption of heavy metals occur, which increases their mobility and promotes removal from the soil profile.

$$Pb(HA)^{2-} \rightarrow Pb^{2+} + 2HA$$

This makes it possible to efficiently extract heavy metals from the soil with subsequent physico-chemical removal processes.

These processes form a complex network of interactions between humates and heavy metals, which leads to effective improvement of soil quality and reduction of pollution.

It is seen that potassium humate forms complexes with the surface of mineral particles in the soil, such as clay minerals.

KHA + Clay -> [KHA-Clay]. Here "Clay" stands for clay, so the reaction indicates the interaction of the "KHA-Clay" complex with clay, which leads to the formation of potassium ions (K^+), acid (HA) and the return of alumina (Clay) to free form.

This reaction leads to the formation of complexes of potassium humate with mineral particles, which contributes to the dissolution and migration of metals associated with these minerals into the soil solution.

Potassium humate can also form complexes with organic material in the soil. For example:

KHA + Organic Matter -> [KHA-Organic]

This reaction leads to the formation of complexes of potassium humate with organic material, which increases the solubility of metals associated with organic matter and their migration into the soil solution.

In the presence of potassium humate, metals associated with mineral particles and organic material in the soil are desorbed. For example:

$$[KHA\text{-}Clay] \rightarrow K^{+} + HA + Clay$$

This reaction leads to the release of metals from complexes with mineral particles, which accelerates their dissolution and migration into the soil solution.

Thus, the interaction of potassium humate with mineral particles and organic material in the soil can contribute to accelerated dissolution and migration of heavy metals, which facilitates their removal from the soil.

Potassium humate can serve as a source of carbon and energy for various microorganisms in the soil. As a result, they can actively reproduce and increase their biomass.

Potassium humate can activate the enzymatic systems of microorganisms involved in the metabolism of various organic and inorganic compounds, including heavy metals.

Microorganisms stimulated by potassium humate may exhibit increased activity in relation to the biological degradation of heavy metals. For example, they can produce metal chelating agents that promote their mobilization from the soil.

Potassium humate can contribute to the development of the rhizosphere, an area of soil located around plant roots, where the processes of interaction of microorganisms with plant roots are actively taking place. An increase in the activity of microorganisms in the rhizosphere can contribute to the biodegradation of heavy metals and their further removal from the soil.

Microorganisms activated by potassium humate can produce various metabolites that can effectively interact with heavy metals, forming poorly soluble complexes or facilitating their biological removal. Thus, the interaction of potassium humate with microorganisms in the soil can stimulate their activity and metabolism, which contributes to the biological degradation of heavy metals and accelerates their removal from the soil.

Based on the conducted experiments, the following conclusions can be drawn:

1. Understand their effectiveness and possible ways to optimize this cleaning method. The use of potassium humate solutions in various concentrations effectively reduces the content of heavy metals in the soil. Higher concentrations of potassium humate usually lead to a more significant decrease in the metal content.

2. The effect of different types of potassium humate solutions (with nitrogen, iron, basic components, NPK and silicon) on soil purification from heavy metals varies. For example, solutions with iron and basic components usually provide higher efficiency than solutions with nitrogen or NPK.

3. The processes of soil purification from heavy metals after treatment with potassium humate solutions may be associated with the formation of complexes between potassium humate and metals, as well as with an increase in the biological activity of soil microorganisms.

4. Additional research is needed on the mechanisms of the effect of potassium humate on the processes of soil purification from heavy metals in order to better

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Conducting a review of works and patent research on water heating technology and technical solutions for jet thermal modules

Sarkynov Yerbol
Candidate of Technical Sciences, Faculty of Engineering and Technology, Kazakh National Agrarian Research University, Almaty, Kazakhstan
Zhakupova Zhanar
PhD, Faculty of Water, Land and Forest Resources, Kazakh National Agrarian Research University, Almaty, Kazakhstan
Alimbetova Aliya
Candidate of Technical Sciences, Kazakh National Agrarian Research University, Almaty, Kazakhstan
Kalkabayeva Aliya
master, Faculty of Engineering and Technology, Kazakh National Agrarian Research University, Almaty, Kazakhstan

Abstract: The conducted research has established that water heating technologies for heat supply of facilities and technological processes of agricultural and other consumers of agro-industrial complex, both in the Republic of Kazakhstan and in the CIS countries and abroad, have been and are currently being implemented using two competing technologies:
- traditional heat supply technology using traditional energy sources (fuel and electric) for heating water;
- energy-saving (alternative) heat supply technology using renewable (non-traditional) energy sources (thermal waters, saturated vapors, hot exhaust gas mixtures, solar) for water heating.
Keywords: Analysis, theoretical study, technological process of water lifting, watercourse, parameter, hydraulic ram pumping unit, non-traditional energy sources

Introduction

The block diagram of the water heating technology for heat supply of facilities and technological processes of agricultural and other consumers of the agro-industrial complex is given in Figure 1.

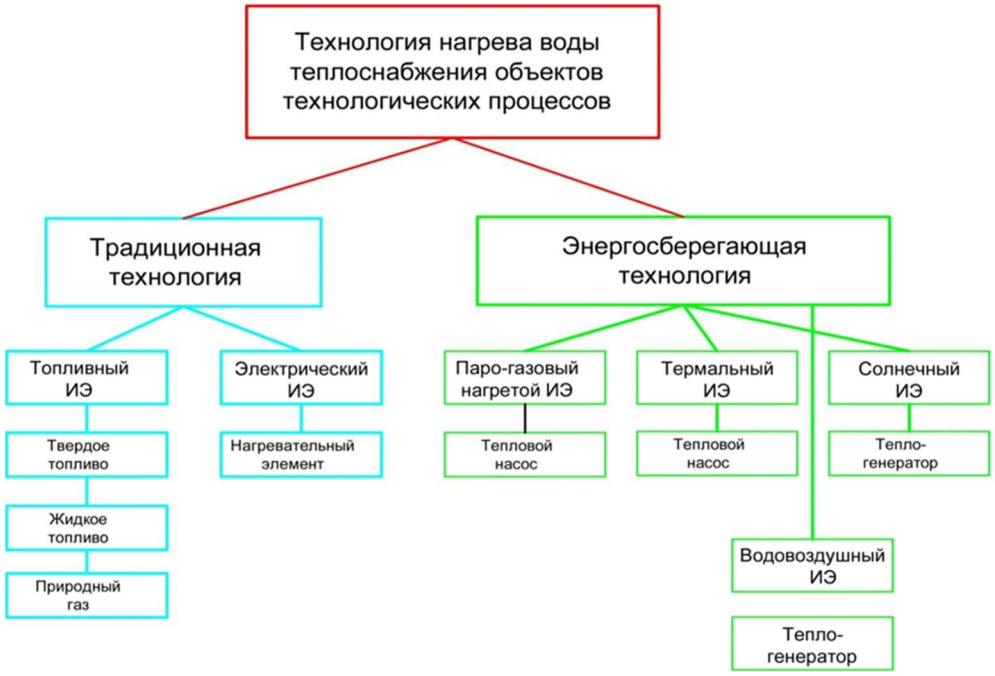


Figure 1 - Block diagram of water heating technology for heat supply of facilities and technological processes

Figure 1 shows that the water heating technology for heating facilities and technological processes reflects the type of technology used and the appropriate energy source for heating water.

The water heating technologies used for heat supply of facilities and technological processes have their advantages and disadvantages.

Traditional water heating technology.

Advantages – the technology of water heating for heat supply of facilities and technological processes has been developed and the equipment is available in the domestic and foreign markets.

Disadvantages – the technology of heating water for the heat supply of facilities and technological processes is not environmentally friendly, since exhaust gases from the operation of the equipment are discharged into the atmosphere; fuel consumption is required; high operating costs caused by the operation of the equipment.

Energy-saving water heating technology for heat supply of facilities and technological processes.

Advantages – water heating technology for heat supply of facilities and technological processes is environmentally friendly and energy-saving, since natural renewable energy sources are used to heat water or the electric energy consumed by heat generators is significantly lower than that given off when heating water; low operating costs caused not by the constant presence of maintenance personnel, but only by maintenance of equipment, and lack of operating costs on the natural energy sources used.

Disadvantages - the technology of water heating for heat supply of facilities and technological processes is not sufficiently developed and the equipment is currently not available on the sales markets.

Comparative estimates of two water heating technologies for heating facilities and technological processes are traditional and energy-saving, the advantage of energy-saving technology is obvious: it is environmentally friendly, saves expensive fuel and reduces operating costs by 1.5-2 times. The disadvantage of energy-saving technology is automatically eliminated with the positive implementation of the project. On this basis, energy-saving water heating technology for heat

supply of facilities and technological processes is reasonably accepted for subsequent research directions.

Development of a research program and methodology. The program and methodology of the work were compiled on the basis of the conducted research on the project, project proposals and regulatory guidelines for research and development of research institutions [1-3].

The program of the dissertation work includes the following research tasks:

- Justification of the research direction. Conducting a review of the work, current patent research and selection of the design and technological scheme of the jet thermal module;
- Conducting theoretical research on the technology of water heating with a jet thermal module;
- Development of methodology and justification of technological and technical parameters of the jet thermal module.
-Conducting experimental studies on an improved sample of a jet thermal module;
- Conducting laboratory tests of an improved sample of the jet thermal module and finalizing the design based on the test results;
-Feasibility study of the completed master's thesis. Recommendations for expanding the scope of application of the jet thermal module at agricultural facilities.

The research methodology is given below for each section of the research tasks.

1.2 Conducting a review of work and current patent research on water heating technologies and technical means

A review of the work and patent research in this area were carried out in the main leading countries: the CIS (Russia, Kazakhstan, Ukraine, etc.), the USA, Great Britain, Germany and Japan, which are fully given in the interim report of KazNARU [2].

The analysis of the identified technical solutions close to the water heating technology being developed and the technical solutions of jet thermal modules is given, analogues are identified, new technical solutions are identified and some of them are adopted to perform the planned work and issue a patent for the invention KZ: "Jet thermal module".

The conducted review of works on energy-saving technologies and technical means of water heating showed that there are several water heating technologies for heat supply of industrial and agricultural facilities, including autonomous ones, which are divided into three areas: heat supply based on the combustion of gas, solid and liquid fuels; the use of electric energy; alternative thermal modules (heat generators), which they give off energy in the form of heat more than they take from the power grid due to changes in the dynamic state of the liquid itself and the surrounding air [4].

The disadvantages of the first direction are large capital investments, operating costs and heat losses, which worsen the ecology of the environment.

The disadvantages of the second direction are high costs of electric energy and a large specific cost of thermal energy, which exceed similar indicators of the first direction by 1.5-2 times.

The disadvantages of the third direction are that the development is at the stage of experimental samples and there are no sales markets.

The proposed project on the technology and technical means used belongs to the third direction - the development of alternative thermal modules (heat generators), and the development of the second direction - electrode heaters (boilers) can be taken as a prototype.

Domestic and foreign works (mainly the works of scientists) are devoted to the development of structures, theoretical and experimental research on alternative sources of water heating by means of thermal modules (heat generators) based on studies of heat formation on multi-jet flows of liquid and gas (water, saturated steam, air) using the effects of cavitation, dynamic braking, vortex formation, hydrodynamic shock Russia): V.V.Fisenko (1978....2000),

Y.S.Potapov (1995....2008) [5,6], B.V.Elin, V.V.Terekhin, N.E.Kurnosov, V.A.Gorlov (1999...2003) [7,8,9], S.V.Geller (1995....2009) [10,11], A.Ya.Isakov (1986...2009) [12,13], Yakovlev A.A., Sarkynov E.S., Alikhanov D.M. and others (2009-2015) [4].

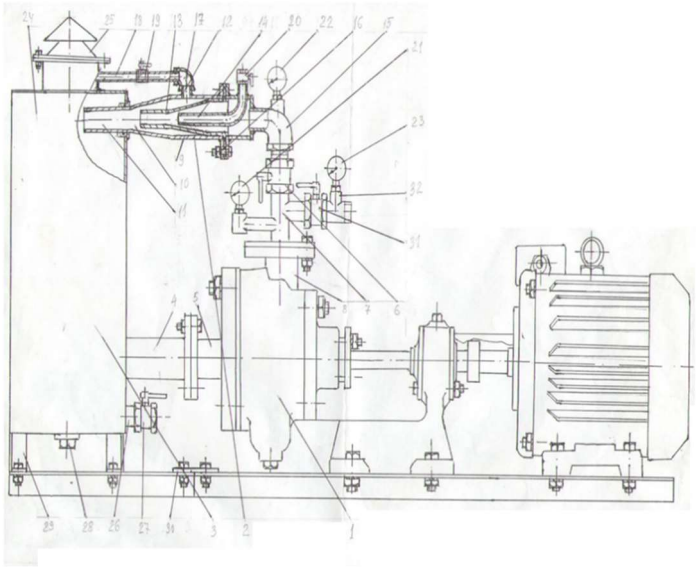
Based on the completed review of the work for further research on improving the technology of water heating, the master's thesis was developed by NAO KazNARU on a grant project.

In NAO KazNARU (2009...2012) conducted research and developed an experimental sample of a jet thermal module for heating water and heat supply of autonomous agricultural facilities, and can also be used to clean polluted air from dust, solid particles and odors and heat recovery in spent air mixtures, the general view of which is shown in Figure 9.

The jet thermal module consists of the following main components: a centrifugal pump 1 driven by an electric motor, an ejector 2 and a tank 3 filled with heated water.

The lower part of the tank is connected through a flanged pipe 4 to the suction pipe of the pump, and the upper part through the ejector 2 and connecting fittings (valve 5 and tee 7) to the discharge pipe 8 of the pump, forming a closed open circulating system for the movement of heated water with the pump running 1.

The ejector 2 is made of a housing 9 with a passive nozzle 10, a mixing chamber 11 and an air suction nozzle 12, an active nozzle 13 in the form of a confuser and a nozzle mounted coaxially inside the housing 9, an additional passive nozzle 14 in the form of a curved tube mounted coaxially inside the active nozzle 13, an inlet nozzle 15 with a flange mount 16, hermetically connected to the active nozzle 13 and the housing 9. The suction nozzle 12 of the ejector housing 9 2 is connected through a square 17, pipelines 18 and a valve 19 to the air separation part of the container 3. The passive nozzle 14 is connected through a valve 20 to the atmospheric air of the room or through a pipeline can be connected, if necessary, to the waste gas-air mixture disposal system. Technical pressure gauges 21,22,23 are installed to control and regulate water pressure in the injection system of water heating and heating.



1- centrifugal pump; 2- ejector; 3 – tank; 4 - flanged nozzle; 5,6,19,20,27,31 – valves; 7 - tee;8 - discharge nozzle of the pump; 9 - ejector body; 10 – passive nozzle; 11-mixing chamber; 12 - air suction nozzle; 13 - active nozzle; 14 - passive nozzle; 15 – inlet pipe; 16 - flange mount; 17 – square; 18 –pipeline; 21 ,22,23 - technical pressure gauges; 24 - insulated tank body; 25 –tank cover; 26 - inlet pipe; 28 - drain plug; 29 – tank mounting post; 30 – connecting bar; 32 - small tee.

Figure 2 - General view of a laboratory sample of a jet thermal module

The water heating tank 3 consists of a housing 24, a flanged cover 25, an inlet pipe 26 with a valve 27, a drain plug 28 and racks 29 for installing and attaching the tank 3 to the frame 29 with bolted connections. The tank frame is rigidly bolted and laths 30 are attached to the pump frame 1.

To connect hot water to heating batteries, there is a water outlet in the discharge tee 7, from which through a valve 31 and a small tee 32 with a pressure gauge 23 and pipelines are connected to heating batteries, water discharge from which through a valve 27 and an inlet pipe 26 enters the container 3

The technological process of heating the water of the thermal module. Water heating occurs due to the release of heat from the friction of jet streams of water and air moving at different speeds, heat removal from the atmospheric air used, from air compression and the effect of cavitation.

The container 3 is filled with heated water, the centrifugal pump 1 is turned on, while the valves 27 and 31 intended for the heating system must be closed and the valve 6 intended for supplying water to the ejector 2 is open. Water from the lower part of the tank 3 is pumped by a pump 1 through a tee 7 through a valve 6 into the inlet nozzle 15 of the ejector 2 and then passes through the active nozzle 13, the jet of which flows around the passive nozzle 14, creating a discharged and simultaneously a jet of water coming out of the nozzle of the active nozzle 13 creates a discharge in the face of the passive nozzle 10. The created discharge in the nozzles is transmitted to the suction nozzles 12 and 14 of the housing 9 and the additional passive nozzle 14, and when the fans 19 and 20 are open, air is sucked in and moves along with water inside and along the periphery of the water jet stream. Passing through the mixing chamber 14 of the ejector, the water-air mixture is poured into the interior of the container, where air is separated from water. In this case, the water heats up, receiving energy from the friction of jet streams of water and air, compression of air with the effect of cavitation.

Some of the separated air is reused, forming an open system in the thermal module for both water and used air.

With the valves 19 and 20 closed, air is not fully or partially sucked into the ejector or in small quantities, only to use the effect of cavitation, water heating during the technological process occurs mainly due to the energies obtained from the friction of water jets of internal and external flow moving at different speeds due to the vacuum formed in passive nozzles, which, as it were, slows down the speed of movement of individual jets of water in relation to the main stream of water.

Heated water is supplied to the consumer through a pipeline connected to a small tee 32, opening the valve 31 and simultaneously closing the valve 6, regulating depending on the required flow of hot water.

When using a jet thermal module for autonomous heat supply of an object, it is necessary to connect it to the thermal batteries of the repelled object, for this purpose a small tee 32 is connected through a pipeline to the supply (discharge) part of the heat receivers (thermal batteries), and the reverse part is connected through a pipeline through a valve 27 with a suction nozzle of the container 3.

After heating the water in the tank 3 to the required temperature, by opening the valve 31 and 27 and closing the valve 6, the heating system is started, the required pressure of the heating system and the thermal module are regulated by the valves 6, 27 and 31, controlling according to the installed pressure gauges 21,22 and 23, by changing the water flow along the contours of the thermal module and the connected thermal network.

The developed jet thermal module according to the description of the technological process can be used both for water heating and for autonomous heat supply of agricultural and

other facilities. Compared with analogues, the design of the thermal module has a technical and technological novelty, one of the main components-the ejector is adopted according to the pre-patent 17788 KZ.

According to the developed design and technological scheme of the string thermal module, experimental studies were carried out, as a result of which it was established that the technological process of heating water occurs due to the release of heat from friction of jet streams of water and air moving at different speeds, as well as air compression created by ejectors during the technological process of vacuuming.

The results of studies of the jet thermal module to determine the dependences of the temperature qk of the heated water and the heat received QT on the duration of water heating t (operation of the thermal module) with the diameters of the active nozzles of the ejector dac = 25mm and 15 mm, an additional passive nozzle dg = 15mm and the volume of heated water V = 80dm are given in Table 1.

Table 1 - Results of studies of the jet thermal module to determine the dependences of the temperature q in the heated water and the heat received Q_T on the duration of water heating t

Number of experiments	Name of the parameters	Designation	Dimension	The value of the parameters						
				Duration of water heating, t, h						
				0	1	2	3	4	5	6
With the diameter of the active ejector nozzle doc = 25 mm and the volume of heated water V = 80 dm										
1	The temperature of the heated water	Θ	^{O}C	17,5	25	30,5	35,1	38,6	41,6	
2	The heat obtained by heating the water	Q_T	kCal	0	600	1040	1408	1704	1928	
With the diameter of the active ejector nozzle doc = 15 m and the volume of heated water V = 90 dm										
3	The temperature of the heated water	Θ	^{O}C	20	26	30,5	34	36,8	39,3	41,1
4	The heat obtained by heating the water	Q_T	kCal	0	540	945	1260	1512	1737	1899

Table 2 shows the results of studies of a jet thermal module with diameters of active ejector nozzles dac = 25mm and 15mm, an additional passive nozzle dg = 15mm and the volume of heated water V = 90dm to determine the dependences of useful thermal power RP and energy WP and spent P3 and WZ on the duration of water heating t (operation of the thermal module).

Table 2 - Results of studies of the jet thermal module to determine the dependencies of the useful thermal power RP and CPU energy and spent P3 and WP on the duration of water heating

Number of experiments	Name of the parameters	Designation	Dimension	The value of the parameters							
				Duration of water heating, t, h							
				0	1	2	3	4	5	6	7
With the diameter of the active ejector nozzle doc = 25 mm and the volume of heated water V = 80 dm											
1	Useful thermal power	*Pn*	Вт	0	700	607	548	497	450		
2	Useful thermal energy	*Wn*	кВт·ч	0	0,70	1,21	1,64	1,99	2,25		
3	Spent thermal power	*Рз*	Вт	0	1460	1460	1460	1460	1460		
4	Spent thermal energy	Wз	кВт·ч	0	1,46	2,92	4,38	5,84	7,30		
With the diameter of the active ejector nozzle doc = 15 m and the volume of heated water V = 80 dm											
5	Useful thermal power	*Pn*	Вт	0	630	551	490	441	405	369	
6	Useful thermal energy	*Wn*	кВт·ч	0	0,63	1,10	1,47	1,76	2,02	2,21	
7	Spent thermal power	*Рз*	Вт	0	1380	1380	1380	1380	1380	1380	
8	Spent thermal energy	Wз	кВт·ч	0	1,38	2,76	4,14	5,52	6,90	8,28	

As a result of experimental studies of a laboratory sample of a jet thermal module, the following parameters were obtained for the volume of heated water in a container of 80 ... 105 dm3, the initial temperature of the water Oh – 15.5 ... 180C and indoor air from 15 ... 170C and the volume of an unheated room of 170 m3: the final temperature of heating water in the tank Ok – up to 420C, the time heating of water in the tank and indoor air t – 1... 7 hours, depending on the installed technological and technical parameters and external influences; the final temperature of heating the air in the room is tk - up to 18 ... 200C; useful thermal power Rp – up to 630 – 700 W, spent thermal power Rz – 1380 – 1460 W; useful thermal energy Wp – up to 0.6 - 2.2 kWh, spent thermal energy Wz – up to 1.4 – 8.2 kWh.

Experimental studies of a laboratory sample of a jet thermal module have shown its operability and the performance of all technological processes, however, it requires improvement in increasing the temperature of water heating to 60-70 ° C.

Based on the results of patent research on water heating technology and technical solutions for jet thermal modules, an analysis of the identified technical solutions close to the jet thermal module being developed is given, analogues are identified, new technical solutions are identified that were adopted to develop an improved design and technological scheme.

The closest analogues of the technical solution of the jet thermal module being developed are the following inventions: patent RU No. 2045715 "Heat generator for heating liquid" by Potapov Yu.S.[6]; patent RU No.2202740 "Heating scheme of a water heating system with a heat generator" by Gorlov V.A.[7]; patent RU No.2135903 "Installation for heating liquids" by authors Elina B.V. and Terekhina V.V.[8]; patent RU No.2190162 "Heat generating unit" by author Kurnosova N.E.[9]; pre-patent KZ No.17788 "Ejector" by authors Yakovlev A.A. and Sarkynova E.

Conclusion.

In the selected analogues, the most advanced and effective methods and methods of liquid heating were used in their technological processes: the effect of friction and braking of a two-phase flow of liquid, gas and saturated water vapor; the effect of a vortex flow and braking of a heated liquid; the effect of swirling and braking of a liquid flow of heated water in a heat generator; the effect of a two-phase counter rotating and linear flow of a water-air mixtures using the process of vacuuming and improving the ambient air quality at facilities. As a result, energy-saving, environmentally friendly and safe water heating technology is used for autonomous heating of facilities.

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FİLTİRLƏMƏ TEXNOLOGİYALARI

Məmmədov Sarvan Kənan
Azərbaycan Texniki Universiteti, Baku, Azerbaijan
Zəkiyeva Nərmin Hikmət
Azərbaycan Texniki Universiteti, Baku, Azerbaijan

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***Açar sözlər**: Veb, Spam, URL və Məzmun filtrləmə texnologiyaları.*

FILTRATION TECHNOLOGIES

Mammadov Sarvan Kanan, Zakiyeva Narmin Hikmat
Azerbaijan Technical University, Baku, Azerbaijan

Summary. Filtering technologies play an important role in controlling access to digital content and reducing online risks. This research paper provides a detailed examination of various filtering technologies, including web filtering, spam filtering, URL filtering, and content filtering devices. The mechanisms, challenges, and advances of each technology are analyzed, and insights into their effectiveness and evolving landscape are provided. Understanding these technologies is critical to improving online security, privacy, and user experience in an increasingly interconnected digital world.

***Keywords:** Web filtering, Spam filtering, URL filtering and Content filtering technologies.*

GİRİŞ

Rəqəmsal əsrdə onlayn məzmunun çoxalması informasiyaya çıxışı idarə etmək və tənzimləmək üçün filtrasiya texnologiyalarının inkişafını zəruri etmişdir. "Filtr" şəbəkə və ya sistem vasitəsilə hərəkət edən məlumatları çeşidləmək və idarə etmək üçün nəzərdə tutulmuş kritik proqram komponenti və ya funksionallığıdır. Potensial olaraq zərərli olan hər şeyin kənarda qalmasını təmin edərkən yaxşı məlumatların ötürülməsinə imkan verən bir ələk kimi fəaliyyət göstərir. Zərərli veb-saytlara girişin qarşısının alınmasından istənməyən e-poçtların qarşısının alınmasına qədər filtrləmə texnologiyaları istifadəçiləri və təşkilatları qorumaq üçün müxtəlif məqsədlərə xidmət edir. Bu məqalə veb filtrləmə, spam filtrləmə, URL filtri və məzmun filtrləmə cihazları daxil olmaqla əsas filtrləmə texnologiyalarının funksionallığını, problemlərini və inkişaflarını araşdırmaq və qiymətləndirmək məqsədi daşıyır. [1]

WEB filtir texnologiyaları

Veb filtrləmə proqramı istifadəçilərin İnternetdə gəzdiyi yerləri izləyir və idarə edir, təşkilata potensial təhdidlərdən qorunmaq və korporativ siyasəti həyata keçirmək üçün veb trafikinə icazə verməyə və ya bloklamağa imkan verir. Filtr hər bir Veb səhifəni əvvəlcədən müəyyən edilmiş qaydalar toplusuna uyğun olaraq yoxlayır və pornoqrafik materiallar, casus proqramlar, viruslar və s. kimi zərərli və mənfi məlumatların şəbəkəyə və ya ev kompüterinə daxil olmasını bloklayır. Veb Filtrləmə, şəbəkə resurslarının lazımsız istifadəsini azaltmaqla, iş məhsuldarlığını artırmaqla,

İnternetdən sui-istifadə risklərini azaltmaqla, təhlükəsizlik və hüquqi riskləri azaltmaqla idarə oluna bilən İnternetə çıxışa zəmanət verir. Veb filtrləmə təşkilata istifadəçilərin gözdən keçirdikləri yerlərə nəzarət etmək imkanı verir ki, bu da bir sıra səbəblərə görə vacibdir:

Zərərli proqramdan qorunma: Fişinq və digər zərərli saytlar zərərli proqram və digər zərərli məzmunu istifadəçilərin kompüterlərinə çatdırmaq üçün istifadə edilə bilər. Veb filtrasiyası təşkilatın şirkət və istifadəçi təhlükəsizliyi üçün təhlükə yaradan vebsaytlara girişi bloklamasına imkan yaradır.

Məlumat Təhlükəsizliyi: Fişinq saytları adətən istifadəçi etimadnamələrini və digər həssas məlumatları oğurlamaq üçün nəzərdə tutulub. Bu səhifələrə girişi bloklamaqla təşkilat bu cür məlumatların sızması və ya pozulması riskini məhdudlaşdırır.

Tənzimləmə Uyğunluğu: Şirkətlər müəyyən növ məlumatların icazəsiz girişdən qorunmasını tələb edən artan sayda məlumatların qorunması qaydalarına riayət etmək üçün məsuliyyət daşıyırlar. Veb filtrləmə ilə təşkilat qorunan məlumatları oğurlamağa cəhd edə biləcək saytlara və məlumat sızdırmaq üçün qəsdən və ya istəmədən istifadə edilə bilən saytlara (məsələn, sosial media və ya şəxsi bulud yaddaşı) girişi idarə edə bilər.

Siyasətlərin Tətbiqi: Veb filtrasiyası təşkilata vebdən istifadə üçün korporativ siyasətləri tətbiq etməyə imkan verir. Bütün növ veb filtrləməsi açıq məzmunlu saytlara baş çəkmək kimi korporativ resurslardan qeyri-adekvat istifadənin qarşısını almaq üçün istifadə edilə bilər.

Veb filtrləmə üsulları vebsaytlara və onlayn məzmuna girişə nəzarət etmək üçün müxtəlif üsulları əhatə edir. Bu üsullar mexanizmləri və etibar etdikləri məlumatlarla fərqlənir. Dörd veb filtrləmə texnikasına aşağıdakılar daxildir[2]:

1. Reytinqə əsaslanan filtrləmə məzmunun uyğunluğu, yaşa uyğunluğu və ya təhlükəsizlik riskləri kimi əvvəlcədən müəyyən edilmiş meyarlar əsasında vebsaytların kateqoriyalara bölünməsini nəzərdə tutur. Veb saytlara onların məzmun növünü və ya potensial təhlükələrini göstərən reytinqlər və ya etiketlər verilir. İstifadəçilər və ya administratorlar daha sonra reytinqlərinə əsasən vebsaytlara girişə icazə vermək və ya bloklamaq üçün filtrləmə siyasətlərini konfiqurasiya edə bilərlər. Bu texnika məzmuna nəzarətdə çeviklik və detallılıq təklif edərək, xüsusi ehtiyacları ödəmək üçün uyğunlaşdırılmış giriş siyasətlərini təmin edir.
2. Qara siyahı filtrləmə, məlum və ya şübhəli zərərli vebsaytlara, arzuolunmaz məzmun mənbələrinə və ya qadağan olunmuş kateqoriyalara girişin qarşısını almağa yönəlmiş veb filtrləmə texnikasıdır. Blok ediləcək kateqoriyalara aid URL-lər qara siyahı təşkil edir. Filtr tələb olunan URL-i qara siyahı ilə müqayisə edir və müvafiq olaraq bu sorğuya icazə verir və ya rədd edir. URL-dən başqa IP ünvanı və Domen adı əsasında qara siyahıya salınmaq da mümkündür. IP ünvan səviyyəsində bloklama müvafiq Veb Serverdə yerləşdirilən bütün domenlərin bloklanmasına imkan verir. Domen adı səviyyəsində bloklama bütün domeni bloklayır. Bu metodun üstünlükləri sürət və səmərəlilikdir, çünki qara siyahıya əsaslanan filtr bloklamadan və ya icazə vermədən əvvəl səhifəni oxumamalıdır. Onun çatışmazlıqları URL verilənlər bazasını yaratmaq və yeniləmək üçün üzləşdiyi çətinliklərdir, çünki bu, çox əmək tələb edir və insan rəyçiləri tələb edir.
3. Açar söz uyğunluğu xüsusi açar sözlər, ifadələr və ya qeyri-məhdud məzmunu göstərən nümunələr üçün veb məzmunun skan edilməsini əhatə edir. Filtrləmə qaydaları bu açar sözlərin mövcudluğu və ya olmaması əsasında müəyyən edilir, müvafiq olaraq girişə icazə verir və ya bloklayır. Açar söz uyğunluğu: Filtrləmənin bu forması digərləri arasında “yeniyetmə”, “cinsi məzmun” və “döş” kimi xüsusi təhqiredici terminlər və ifadələr üçün veb-trafikin yoxlanılması ilə işləyir. O, girişin verilməsi və ya rədd edilməsinin lazım olduğunu müəyyən etmək üçün bu söz və ifadələri əvvəlcədən müəyyən edilmiş toplu ilə müqayisə edir. Açar söz uyğunluğu filtrləri yalnız mətn təhlilinə əsaslanır və onları sürət baxımından səmərəli edir. Lakin "yeniyetmələr kitabxanası" və ya "döş xərçəngi" kimi

qanuni veb məzmunda təhqiredici kimi etiketlənən zərərsiz sözlər görünsə belə, həddindən artıq bloklama səhvlərinə səbəb ola bilər. Həddindən artıq bloklanma problemini azaltmaq üçün daha mürəkkəb məzmun təhlili metodlarından istifadə olunsa da, bunlar çox vaxt artan emal vaxtının bahasına başa gəlir. Bundan əlavə, pornoqrafiya məzmununun filtrasiyasında açar söz uyğunluğu filtrlərinin effektivliyi məhduddur, çünki pornoqrafik material adətən böyük həcmdə vizual məlumatlardan ibarətdir.

4. Dinamik Filtrləmə: Bu filtrlər emal ediləcək məlumatların mənasını anlamaq üçün Bayesian, k-Nearest Neighbor və digərləri kimi müxtəlif statistik maşın öyrənmə metodlarından istifadə edir. Onlar müxtəlif funksiyalardan istifadə edirlər: mətn xüsusiyyətləri (“gənclik”, “qumar” kimi sözlər), şəkillər və ola bilsin, video kliplər. Dəri modeli, dəri araşdırması və maraq sahələri kimi alqoritmlər pornoqrafiyanın rəngi, forması və dərisi üçün şəkilləri süzmək üçün istifadə olunur. Dinamik filtrlər öyrənilə bilər və istifadə olunduqca daha çox öyrənməyə davam edir. Pornoqrafiyanı bloklamaq üçün kifayət qədər effektiv olan bir neçə dinamik filtr kommersiya baxımından mövcuddur. Dinamik filtrlər kateqoriyalara ayrılmış qara siyahıların verilənlər bazası yaratmaq və saxlamaq üçün də istifadə edilə bilər. Avtomatik filtrləmə və öyrənmə imkanlarının üstünlüklərini təklif edən dinamik filtrləmə daha yüksək effektivliklə dizayn edilə bilər, lakin ondan yalnız emal sürəti üçün istifadə ISP və müəssisələr kimi yerlərdə istifadəsini yararsız edir.

SPAM filtirləmə texnologiyaları

Spam, alıcılara ayrı-seçkilik etmədən kommersiya məzmunlu istənməyən toplu mesajların göndərilməsi üçün elektron rabitə kanallarından istifadə kimi müəyyən edilir. Spam filtrləri proqramı e-poçt xidmətində daxil olan məktubları yoxlamaq üçün istifadə olunur, xüsusi e-poçtun spam və ya qanuni poçtun saxlanmasıdır. Maşın öyrənməsi və nümunənin tanınması alqoritmləri spam e-poçtları, zərərli proqramları filtrləmək üçün istifadə olunur. [3]

Qlobal e-poçt trafikinin 70%-dən çoxu spam kimi tanınan istənməyən və kommersiya birbaşa marketinqindən ibarətdir. Spamla məşğul olmaq təşkilatlar üçün yüksək xərclərə səbəb olur ki, bu da spam filtrləri quraşdıraraq spamla bağlı xərcləri azaltmağa çalışır. Tədqiqatlarımız göstərir ki, mərkəzi İT xərcləri az əhəmiyyət kəsb edir, çünki spam xərclərinin əksəriyyəti iş vaxtını spamın müəyyən edilməsi və silinməsinə sərf edən işçilərdən qaynaqlanır. Spamın səbəb olduğu iş vaxtı itkiləri hər bir işçiyə ildə təxminən 1200 dəqiqə təşkil edir; spam filtri mexanizminin quraşdırılması ilə bu xərclər təxminən 35% azaldıla bilər. Spam filtrinin quraşdırılmasının fərdi səmərəliliyi qəbul edilən spamın miqdarından və spam haqqında bilik səviyyəsindən asılıdır. [4]

Hər il orta hesabla e-poçt istifadəçisi tərəfindən qəbul edilən istənməyən e-poçtların miqdarı kəskin şəkildə artır.

Bu məqalədə ən çox yayılmış spam filtrləmə texnologiyalarından bir neçəsinin necə işlədiyini, onların spamın qarşısını almaqda nə qədər effektiv olduğunu, onların güclü və zəif tərəflərini və spam göndərənlərin onlardan yan keçmək üçün istifadə etdiyi üsulları ətraflı təsvir edək:

1. İmza uyğunluğu spam e-poçtlarını müəyyən etmək və silmək üçün anti-spam proqram təminatı tərəfindən istifadə edilən üsuldur. O, spam mesajları üçün unikal imzalar yaratmaq və onları məlum spam imzalarının verilənlər bazası ilə müqayisə etməklə işləyir. Uyğunluq aşkar edildikdə, mesaj spam kimi qeyd olunur.
2. Evristik filtrləmə təyin edilmiş qaydalar vasitəsilə ümumi spam xüsusiyyətlərini təhlil edərək spamı səmərəli şəkildə müəyyən edir. Təxminən 95% dəqiqliklə, sürətli, quraşdırmaq asandır, lakin inkişaf edən spam taktikalarına qarşı durmaq üçün tez-tez yeniləmələr tələb olunur. Spam göndərənlər qaydalardan yan keçmək üçün mesajlar hazırlamaqla ondan yayınmağa çalışırlar, lakin qaydaları yeniləmək və bir qədər məxfi saxlamaq onların səylərini azalda bilər. Bütövlükdə, evristik filtrləmə effektiv şəkildə tətbiq edildikdə, spam əleyhinə güclü bir həlldir.

3. Bayesian Filtrləmə, spam və qeyri-spam e-poçt kolleksiyalarını bir-birindən ayırmağı öyrənən mürəkkəb spam aşkarlama texnologiyasıdır. O, e-məktublardakı ayrı-ayrı sözləri təhlil edir və söz baş vermə nümunələri əsasında mesajın spam olma ehtimalını hesablayır. Bununla Bayesian filtrləri emal üçün təlim müddəti və əhəmiyyətli sistem resursları tələb edir. Spam göndərənlər bu filtrdən yan keçmək üçün mübarizə aparsalar da, onların güclü alqoritmi səbəbindən cəhdləri adətən uğursuz olur. Bayesian filtrləmə yüksək dəqiqliyə malikdir, lakin resurs məhdud sistemlər üçün uyğun olmaya bilər. Digər filtrləmə üsullarını effektiv şəkildə tamamlayır.
4. DNS qara siyahısı məlum spam hostlarının mərkəzləşdirilmiş məlumat bazasını saxlamaqla spam e-poçtları bloklamaq üçün istifadə edilən bir üsuldur. E-poçt əməliyyatları zamanı serverlər gələn mesajları qəbul edib-etməməyi müəyyən etmək üçün bu verilənlər bazasını sorğulayır. Bu yanaşma sadəliyi və az resurs istifadəsi üçün üstünlük təşkil edir. Qanuni saytlar səhvən qara siyahıya düşə bilər və silinməsi çətin ola bilər. Bundan əlavə, uzaq DNS serverlərinə etibar risklər yaradır, çünki şəbəkə problemləri lazımi yoxlamalar olmadan spam e-poçtların qəbulu ilə nəticələnə bilər. Bu məhdudiyyətlərə baxmayaraq, DNS-in qara siyahısı istifadədə qalır, lakin bir çox saytlar çatışmazlıqlarını aradan qaldırmaq üçün daha mürəkkəb spam filtrləmə üsullarına üstünlük verirlər.

Bu gün bir çox anti-spam texnologiyaları mövcuddur və daha çox inkişaf etdirilir. Heç bir üsul mükəmməl həll təklif etmir, çünki hər biri spam göndərənlər tərəfindən istismar edilə bilər. Ən təsirli yanaşma eyni vaxtda bir neçə filtrasiya metodundan istifadə etməkdir. Bu üst-üstə düşən strategiya spam göndərənlərin aşkarlanmaqdan yayınmasını olduqca çətinləşdirir, çünki çoxsaylı filtrlərdən yan keçmək üçün mesajlar hazırlamaq olduqca çətindir. Bununla belə, filtrləmə üsullarının istifadəsini balanslaşdırmaq çox vacibdir, çünki hər biri e-poçt serverinin işinə təsir edə bilər. Tipik olaraq, iki və ya üç filtrdən istifadə əhəmiyyətli dəqiqlik verir və bu nöqtədən kənarda gəlirlər azalır.

PreciseMail Anti-Spam Gateway İnternet gatewayündə və ya poçt serverində spam, fişinq və virus təhlükələrini aradan qaldıran müəssisə proqram həllidir. O, qanuni mesajları süzmədən 98% spam aşkarlama dəqiqliyinə malikdir. PreciseMail Anti-Spam Gateway sübut edilmiş evristik, DNS qara siyahısı və Bayesian süni intellekt texnologiyalarının birləşməsinə əsaslanan, spam mesajlarını qanuni e-poçtdan avtomatik olaraq ayırmağı öyrənən yüksək mürəkkəb filtrləmə mühərrikinə malikdir. Nəticədə PreciseMail Anti-Spam Gateway spam hücumu baş verdikdən sonra onları bloklayan qaydalar yaradaraq məlum spam göndərənlərə passiv reaksiya vermək əvəzinə e-poçtun spam olub-olmadığını müəyyən edə bilər.

URL filtirləmə texnologiyaları

İstifadəçilər şəxsi və biznes məqsədləri üçün internetdə daha çox vaxt keçirdikcə, təşkilatlar artan təhlükəsizlik və biznes riskləri ilə üzləşirlər. Məhdudiyyətsiz veb fəaliyyəti təhdidlərin yayılmasına, məlumat itkisinə və uyğunluq problemlərinə səbəb ola bilər. Bu riskləri azaltmaq üçün şirkətlər ənənəvi olaraq URL filtrindən istifadə edirlər. Bu alət məhsuldar olmayan saytları bloklamaqla və zərərli proqram və fişinq kimi qabaqcıl təhdidlərdən qorunmaqla təhlükəsiz internetə girişi təmin edir. Veb filtrləmə kimi də tanınan URL filtrasiyası zərərli vebsaytlara girişin bloklanmasını nəzərdə tutur. Veb əsaslı təhdidlərə qarşı güclü qorunma təklif edən URL filtrləri daxil oluna bilən məzmunu süzərək və ya xəta törədən saytları və yükləmələri tamamilə bloklamaqla istifadəçiləri və daxili şəbəkələri qorumağa kömək edir.

URL təsnifatı üçün maşın öyrənmə alqoritmlərinin və neyron şəbəkə modellərinin istifadəsi daxildir. Bildirilir ki, bu tədqiqatlarda URL ünvanlarından çıxarılan xüsusiyyətlər mətn xüsusiyyətlərini və host məlumatlarını ehtiva edən xüsusiyyət vektorları kimi istifadə olunur. Bu sitatda internet ünvanlarından zərərli istifadə və aşkarlama üsulları ilə bağlı araşdırmalardan bəhs

edilir. Bu cür araşdırmaların şəbəkə təhlükəsizliyini təmin etmək və istifadəçiləri qorumaq üçün vacib olduğu vurğulanır.

Cisco, Websense, Surfcontrol, Blue Coat və Gemtek kimi bir neçə xidmət və cihaz təminatçıları veb trafiki təsnif etmək, izləmək və idarə etmək üçün həll yolu kimi şəbəkə əsaslı URL filtrasiyasını (NUF) təmin edir.

NUF texnologiyası və ya Şəbəkəyə əsaslanan URL Filtrləmə, onların URL-lərinə əsaslanaraq veb-saytlara girişə nəzarət etmək üçün bir üsuldur. O, istifadəçilərin sorğularında URL-ləri təhlil edərək, onları kateqoriyalara ayırmaqla və sonra əvvəlcədən müəyyən edilmiş qaydalara uyğun olaraq girişə icazə vermək və ya bloklamaqla işləyir. Bu, təşkilatlara internetdən istifadə siyasətlərini tətbiq etməyə və şəbəkə təhlükəsizliyini gücləndirməyə kömək edir. [5]

1. Istifadəçi veb-serverdə səhifəni nəzərdən keçirir və brauzer veb serverə HTTP sorğusu göndərir.
2. Gateway URL-ni çıxarır: Gateway HTTP sorğusunu kəsir, URL-i çıxarır və təhlil üçün şəbəkə serverlərinə göndərir. Bu vaxt sorğu hələ də veb serverə göndərilir.
3. URL təhlili və təsnifatı: Şəbəkə serveri URL ilə təmsil olunan veb-saytı kateqoriyalara ayırmaq üçün verilənlər bazasını yoxlayır. O, kateqoriyanı təmsil etmək üçün kateqoriya ID (tam ədəd) təyin edir, məsələn, fayl paylaşımı üçün "P2P" və ya "onlayn xəbərlər".
4. HTTP Response Queued: Veb serverdən gələn cavab gatewaydən qərar gözləyərək növbəyə qoyulur.
5. Gateway Qərar və Fəaliyyət: Təhlil nəticəsini aldıqdan sonra gateway idarəetmə siyasətlərinə əsasən HTTP cavabına icazə və ya bloklamaya qərar verir. Məsələn, P2P girişinə yalnız daxili sınaq laboratoriyasında icazə verilirsə, gateway mənbə IP-ni yoxlayır. Əgər laboratoriyanın əhatə dairəsindədirsə, cavab istifadəçiyə göndərilir. Əks halda, xəbərdarlıq səhifəsi göstərilir.

Content Filtering Devices

Məzmun filtrasiyası ilə proqram və avadanlıqlar müəyyən məzmuna və ya veb-saytlara girişi müəyyənləşdirir və bloklayır. O, mətn sətirləri və ya arzuolunmaz məzmunun mövcudluğunu bildirən şəkillərdəki obyektlər kimi məzmunda xüsusi nümunələri müəyyən edə bilər. O, adətən veb səhifələrə və ya hətta bütün vebsaytlara girişi bloklamaq üçün açar sözlərdən istifadə edir.

Məzmun filtrləmə cihazları fərdləri, təşkilatları və cəmiyyətləri zərərli və ya arzuolunmaz onlayn məzmundan qorumaqda mühüm rol oynayır. İnternetdən istifadənin eksponensial artımı və onlayn məzmunun müxtəlifliyi ilə, möhkəm məzmun filtrləmə mexanizmlərinə ehtiyac həmişəkindən daha çox aktuallaşıb. [6]

Məzmun Filtrləmə Cihazlarının Texnoloji Əsasları: Məzmun filtrləmə cihazları onlayn məzmunu təhlil etmək və təsnif etmək üçün müxtəlif texnologiya və üsullardan istifadə edir. Bunlara daxildir:

1. Açar söz filtrasiyası: Bu ənənəvi yanaşma, xüsusi açar sözlər və ya ziddiyyətli materialla əlaqəli ifadələr əsasında məzmunun yoxlanılmasını nəzərdə tutur. Müəyyən dərəcədə effektiv olsa da, açar söz filtrləməsi kontekstlə əlaqəli məzmunu dəqiq müəyyən etməkdə məhdudiyyətlərə malikdir.
2. Nümunə Uyğunluğu: Məzmun filtrləmə cihazları gələn məlumat paketlərində mətn sətirləri, URL-lər və ya şəkil atributları kimi əvvəlcədən təyin edilmiş nümunələri aşkar etmək üçün nümunə uyğunlaşdırma alqoritmlərindən istifadə edir. Bu nümunələri məlum zərərli və ya arzuolunmaz məzmunun verilənlər bazası ilə müqayisə etməklə, cihaz potensial zərərli materialı qeyd edə və ya bloklaya bilər.
3. Maşın Öyrənməsi və AI: Qabaqcıl sistemlər davamlı olaraq yeni təhdidlərə uyğunlaşmaq üçün bu texnologiyalardan istifadə edir. Etiketli verilənlər bazası üzərində təlim keçməklə,

onlar zərərli niyyəti göstərən incə nümunələri müəyyən edə, aşkarlamağı gücləndirə bilərlər.

Bu cihazların müxtəlif tətbiqləri var:

1. Korporativ Şəbəkələr: Onlar istifadə siyasətlərini tətbiq edir, işlə bağlı olmayan saytları bloklayır və müəssisə parametrlərində zərərli proqram və fişinq hücumlarından qoruyur.
2. Təhsil müəssisələri: Məktəblər onlardan təhlükəsiz onlayn öyrənmə mühitləri yaratmaq, uyğun olmayan məzmunu bloklamaq və tələbələr arasında rəqəmsal vətəndaşlığı təşviq etmək üçün istifadə edir.
3. Hökumət qaydaları: Hökumətlər senzura qanunlarını tətbiq etmək, həssas materiallara girişi məhdudlaşdırmaq və onlayn radikallaşma və ekstremizmə qarşı mübarizə aparmaq üçün məzmun filtrlərindən istifadə edir.

Nəticə.Bu elmi məqalə, veb, spam, URL və məzmun filtrasiyası texnologiyalarının təhlükəsizlik, iş məhsuldarlığı və korporativ siyasətlərin tətbiqi üzrə əhəmiyyətini vurğulayır. Bu filtrləmə texnologiyaları, zərərli məzmunun və saytların məhdudlaşdırılması, spam e-poçtlarının qarşısının alınması, iş vaxtının idarə olunması və korporativ siyasətlərin tətbiqi üçün əsaslı bir alət təşkil edir. İmza uyğunluğu, evristik filtrləmə, Bayesian filtrləmə, açar söz filtrasiyası, nümunə uyğunluğu, maşın öyrənməsi və AI kimi müxtəlif metodlar bu məqsədlərə çatmaq üçün istifadə olunur. Bu texnologiyaların istifadəsi, işlərin effektivliyini artırmaq və şəbəkə təhlükəsizliyini təmin etmək üçün əhəmiyyətli bir təcrübəni təmin edir.

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TƏHLÜKƏSİZ ŞƏBƏKƏ ƏLAQƏSİNİN QURULMASI : VİRTUAL ŞƏXSİ ŞƏBƏKƏLƏRİN İSTİFADƏSİ (VPN)

Məmmədov Sarvan Kənan
Azərbaycan Texniki Universiteti, Baku, Azerbaijan
Zəkiyeva Nərmin Hikmət
Azərbaycan Texniki Universiteti, Baku, Azerbaijan

Xülasə

"Virtual Private Network (VPN)" ifadəsi, şəbəkədəki xüsusi məlumatlara müraciət etmək istəyən istifadəçilər və ya şirkətin bölgə ofisini şirkətin özü ilə birləşdirmək üçün global İnternet kimi ictimai şəbəkə infrastrukturunu istifadə edərək yaradılan bir şəbəkədən bəhs edir. Bir VPN, yalnız icazə verilmiş istifadəçilərin sistəmə daxil ola biləcəyini təsdiq etmək üçün şifrələmə və digər təhlükəsizlik vasitələri istifadə edərək özünü qoruyan gizli şəbəkəni qoruyur və məlumatların müdafiəsini təmin edir. Bu məqalə, Virtual Private Network (VPN) və onun protokolları barədə izah edir.

Açar sözlər: *VPN, Şəbəkə, Protokollar, Şifrələmə, WAN, QoS, İnkapsulasiya.*

SETTING UP A SECURE NETWORK CONNECTION: USING VIRTUAL PRIVATE NETWORKS (VPN)

Mammadov Sarvan Kanan, Zakiyeva Narmin Hikmat
Azerbaijan Technical University, Baku, Azerbaijan

Summary

The term "Virtual Private Network (VPN)" refers to a network created using a public network infrastructure, such as the global Internet, to connect users who want to access private information on the network, or to connect a company's regional office with the company itself. A VPN maintains a self-protected private network and ensures data protection by using encryption and other security measures to ensure that only authorized users can access the system. This article explains about Virtual Private Network (VPN) and its protocols.

Keywords: *VPN, Network, Protocols, Encryption, WAN, QoS, Encapsulation.*

Giriş

Virtual şəxsi şəbəkə (VPN), gizli bir şəbəkəni ictimai şəbəkə üzərində genişləndirir və istifadəçilərə öz hesablama cihazlarının məxfi sistəmə doğrudan bağlı olduğu kimi qopmalı və ya ictimai şəbəkələrdən məlumat göndərmək və alınmasına imkan verir. VPN-də işləyən tətbiqlər bu cür gizli şəbəkənin funksiyalarından, təhlükəsizliyindən və idarəetməsindən istifadə edə bilərlər.[1] VPN, uzaq məntəqələr arasında kompüterləri birləşdirmək üçün ən yaygın texnologiya deyildir. Bir neçə ildən əvvəl, kompüterlərin bir-birinə bağlanması üçün ən yaygın yol kirayə verilmiş xətlərdi. İnteqrasiya xidmətlər rəqəmsal şəbəkə (ISDN, 128 Kbps) kimi kirayə verilmiş xətlərdir və bunlar bir telekommunikasiya şirkəti öz müştərilərinə kirayələyə bilərdi. Kirayə verilmiş xətlər şirkətə məxfi şəbəkəsini yaxşılaşdırma imkanı verirdi. Virtual circuit-lərin mənşəyi çox qədimdir. Əvvəllər bu virtual dairə isə əsasən yetərli şəbəkələrdə həyata keçirilir və maliyyəli cəhətdən sərfəlidir. Virtual dairənin əsas strukturu, mənbə portundan məqsəd portuna loqikal bir yol yaratmaktır. Bu yol,

dairənin formalaşdırılması üçün çox sayda hoplar arasında ola bilər. Neticədə, loqikal yol və ya virtual dairə, iki port arasında doğrudan bir bağlantı kimi fəaliyyət göstərir. Bu şəkildə, iki tətbiq sahələri bir-birilə ictimai şəbəkə üzərində kommunikasiya edə bilərlər. Virtual dairə texnologiyası, şifrləmə avadanlıqlarının router sistemlərinə əlavə edilməsi ilə inkişaf etdi. Bu yeni avadanlıq, virtual dairənin portları arasında məlumatı şifrələyirdi. Bu, hücumçuların kommunikasiya edən tərəflər arasında tranzitdə olan məlumatlara çatmağını maneələyirdi. Daha sonra, simli təsdiq etmə kimi digər təhlükəsizlik texnologiyaları əlavə olundu. Kommunikasiya xəttləri, təəssüf ki, hələ də hücuma açıq idi və bu da ictimai şəbəkə üzərində təhlükəsiz kommunikasiyanın inkişafına səbəb oldu, yəni VPN. [2]

VPN-ləri nəyə görə istifadə edirik

VPN-lərdən istifadənin əsas faydası, istehlakçının baxışından, onların hesabına sərfəlidirlər. VPN texnologiyasından istifadə etməyin alternativi yüksək sürətli icarə verilmiş xətti istifadə etməkdir. Bu xəttlər bahalı, idarə olunması çətin və qeyri-idarə olunması çətindir. Bundan əlavə, icarə verilmiş xəttin sıradan çıxması halında nə olacağını nəzərə alın. İki tərəf arasındakı əlaqə də yalnız uyğun qüvvələrin xəttı bərpa etdikdə qədər qarışır. Lakin, Virtual Private texnologiyası istifadə edildikdə, xətt və ya xəttlər arasında nöqtənin sıradan çıxması halında, əlaqələr arasındakı məntiqi yol istifadəçiyə tam şəffaflıqla dəyişdirilir.

İnternetin əlaqələrdə arxa planda istifadə edilməsi xidmətin etibarlılığını təmin edir. İnternet VPN istifadəçiləri üçün daha da çox fayda verir. Ən uzaq bölgələr belə dial-up modelləri vasitəsilə İnternetə daxil olurlar. VPN-lər dial-in istifadəçiləri üçün təhlükəsiz əlaqə təmin edirlər. Hərəkət halındakı istifadəçilər korporativ saytla əlaqə qurmaq üçün icarə verilmiş xəttlərdən istifadə etməzlər və beləliklə, VPN texnologiyası bu problemin yeganə həqiqi həlli olduğu halda, şirkətlər əlavə faydalara malikdirlər.

Əlavə olaraq, istifadəçiyə əsaslanan təsdiqləmə ilə, şirkətlər işçilərinin giriş etdikləri məlumatları daha yaxından nəzarət altında saxlaya bilərlər və beləliklə, daxili qarışıqlığın ölçüsünü məhdudlaşdıra bilərlər. VPN-lər əsasən internet əlaqəsindən istifadə edirlər. İnternet ən yüksək performanslı həlli təmin etmir, lakin istifadəçilərə öz şəxsi şəbəkələri kimi İnternetdən istifadə etməyə imkan verir. Bu, istifadəçilərin əlində olan məlumat zəncirinə giriş imkanı verir, eyni zamanda düşük məlumatdaş, təhlükəsiz əlaqə kanalları vasitəsilə tərəflər arasında əlaqələri müstəqil olaraq təmin edir. Şirkətlərin VPN-lər qurmaq üçün güclü motivasiyaları var: Onlar, istifadəçilər üçün şəffaflığa malik bir birgə korporativ kompüter mühiti, təhlükəsiz əlaqələr və özəlliklə, xüsusi WAN qurmaq və idarə etməkdən daha sərfəli bir ümumi dövlət infrastukturunun istifadə edilməsi ilə əlçatır. Çoxsaylı şəbəkələşmə texnologiyaları öz ilk ümidlərinə cavab verməmişdilər, lakin VPN-lər üçün belə deyil, çünki onlar geniş yayılmaqda və ənənəvi olmayan şəbəkələr adını qazanmaqdadırlar. VPN-lər sərfiyyatı dəyərləndirmək və həm də sərbəstlik vəziyyətini artırır, çünki şirkətlər global İnternet əlaqələrini tələbə əsasında quraraq və ya azaldaraq, ilk başda az lenti ödəyərək və tələb artdıqda lenti artıraraq tətbiq edə bilirlər. İnternet əlaqəsi həmçinin VPN-lərin əsas mənfiyyətidir: İnternet üzərində xidmətin keyfiyyətini (QoS) təmin etmək çətindir, çünki toplu trafik axını təxmin edilə bilməz. İnternet xidmət provayderləri (ISP) və korporasiyalar arasında xidmət səviyyəsində razılaşmalar (SLAs) ötürmə qabiliyyəti, əlçatanlıq və/və ya cavab müddəti hədləri əsasında QoS-yə zəmanət vermək üçün hazırlanmış inkişaf edən müqavilə həllidir. [3]

Protokollar:

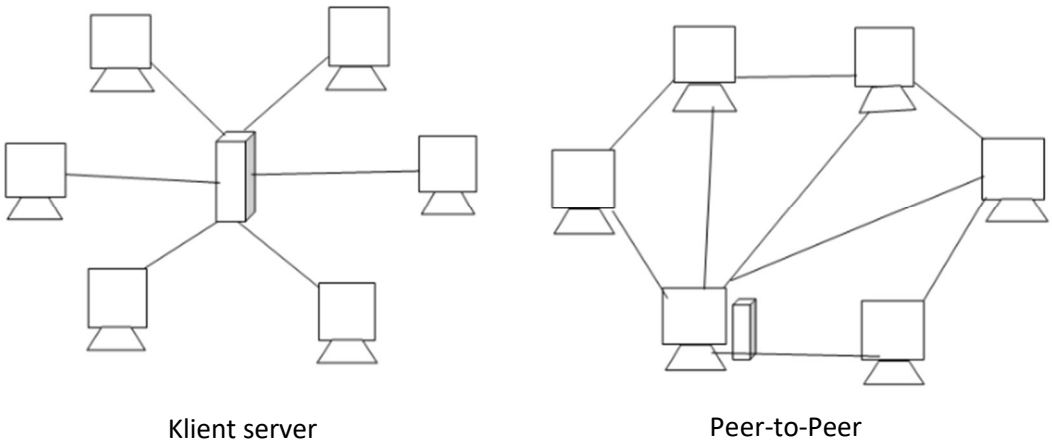
Peer-to-Peer VPN:

Peer-to-Peer (P2P) VPN sistemləri yalnız müxtəlif tərəfdaşlara etibarlı şəkildə qatılmağa imkan verir. Buna müştərilərin autentifikasiyası üçün əlaqə mərkəzi kimi mərkəzi serverdən istifadə etməklə nail olmaq olar. Alternativ olaraq, istifadəçilər mərkəzləşdirilməmiş şəbəkə yaratmaq üçün dostları ilə parol və ya kriptoqrafik açarlar mübadiləsi edə bilərlər. Tunelləşdirmə bir növ protokol paketinin dataqramda inkapsulyasiyasını təmin edən şəbəkə texnologiyasıdır. fərqli protokol. Məsələn, Windows VPN bağlantıları İnternet kimi ictimai şəbəkə üzərindən TCP/IP trafiki kimi şəxsi şəbəkə trafikini əhatə etmək və göndərmək üçün Nöqtədən Nöqtə Tunel Protokolu (PPTP) paketlərindən istifadə edə bilər.
[4]
VPN serveri autentifikasiya təminatçısı kimi Windows və ya uzaqdan autentifikasiya istifadəçi xidmətindən istifadə etmək üçün konfiqurasiya edilə bilər. Əgər autentifikasiya provayderi olaraq Windows seçilibsə, VPN bağlantıları cəhd edən istifadəçilər tərəfindən göndərilən istifadəçi məlumatları tipik Windows autentifikasiya mexanizmləri istifadə edilərək autentifikasiya edilir və bağlantı cəhdinin icazəsi VPN istifadəçi hesabının xüsusiyyətləri və lokal uzaq müraciət siyasətləri istifadə edilərək təmin edilir.

MPLS VPN:
Multi-Protocol Label Switching (MPLS) VPN, bir MPLS üzərində bəzi növ şəbəkə trafikini daşımaq və yönləndirmək üçün quruluşlara geniş imkan təmin edən sərbəst bir metoddur. MPLS VPN-ləri MPLS və Border Gateway Protocol (BGP) yönləndirmə protokolunun gücünü birləşdirir. MPLS, paketlərin təchizatçının şəbəkəsində ötürülməsi üçün istifadə olunur, və BGP, köklərin dağıtılması üçün istifadə olunur. [5]

MPLS VPN nümunəsi aşağıdakı qurğuları daxil edir:
Customer Edge (CE) routerləri: Bunlar yerlərə qoyulur və əsasən müəssisə müştərisi tərəfindən mülkiyyətə malikdir. Bəzi servis təminatçıları CE avadanlığını kiçik bir kirayə ödəmə ilə təmin edir.
Provider Edge (PE) routerləri: Bunlar müxtəlif CE routerlərinin qoşulduğu təchizatçının kənar routerləridir. PE routerləri daima servis təminatçısı tərəfindən mülkiyyətə malikdir.

Provider (P) routerləri: Bu routerlər ümumiyyətlə "keçid routerləri" kimi adlandırılır və servis təminatçısının əsas şəbəkəsindədir. İlkin tətbiq edildiyi kimi, təchizatçı PE routerindən CE routerinə, ya da BGP kimi bir routinq protokolu istifadə edilərək routerlər arasında routinq məlumatları keçirilir. PE routeri hər bir VPN-ə məxsus interfeys və ya interfeys qrupu üçün öz VRF-i saxlayır. Hər bir PE routeri xidmət təminatçısı tərəfindən özünə məxsus olan bir VRF ilə konfiqurasiya olunur. MPLS VPN şəbəkəsi daxilindəki routerlər VRF məlumatlarını doğrudan paylaşmırlar.[6]



Şəkil 1. Peer-to-Peer arxitektura

Nəticə

VPN-lər istifadəçilərə və ya korporasiyalara, müntəzəm serverlərə, filial ofislərə və ya digər şirkətlərə açıq internet şəbəkəsi üzərində təhlükəsiz əlaqələndirilməyə imkan verir. Bütün bu hallarda, təhlükəsiz əlaqə istifadəçiyə açıq şəbəkə əlaqəsi kimi görünür - hər halda ki, bu əlaqə açıq internet şəbəkəsi üzərində baş verir. VPN texnologiyası, artan telekommunikasiya və geniş yayılmış global əməliyyatların iş məntəqələrinə çəkilən cari tendensiyanın ətrafındakı məsələləri həll etmək üçün nəzərdə tutulmuşdur, burada işçilər mərkəzi resurslara qoşulmalı və bir-birilə əlaqə qurmalıdırlar.

Biz VPN-lərin müxtəlif növlərini kateqoriyalandırdıq və müştərinin istənilən imkanları seçməsinə imkan verdiyini qeyd etdik. VPN-lər müxtəlif şifrləmə, təsdiqləmə və müdafiə alqoritmləri təklif edə bilərlər. Şirkət ofisləri üçün təhlükəsizlik profilini təyin edə bilər və onların ehtiyaclarına ən uyğun VPN həllini seçə bilərlər. VPN-lərdə istifadə olunan müxtəlif protokolları ətraflı şəkildə araşdırdıq və VPN texnologiyasının yeni olması səbəbindən, heç bir standartın açıq bir çoxluğu tərəfindən hələlik qəbul edilmədiyini qeyd etdik. VPN-lər hələ körpəlik mərhələsindədir və VPN-lər üçün tam potensial hələ istifadə olunmur. VPN-lər İnternet vasitəsilə təhlükəsiz ünsiyyət üçün gələcək vəd edir. Növbəti illərdə VPN sənayesinin çox böyük bir bazar olacağı gözlənilir. Seçilmiş standartların müştərinin ehtiyaclarına uyğun olması və onların çevikliyinin qorunub saxlanması vacibdir.

VPN-lər güclü, ucuz, çox təhlükəsiz bir əlaqə alətidir. Növbədən növbə VPN-lərin təhlükəsiz internet əlaqəsini təyin etmək üçün yeni texnologiyaların inkişafı bir neçə il müddətinə əsas təyin edə bilər.

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PREDICTION OF THE OUTFLOW OF MOBILE OPERATOR SUBSCRIBERS BASED ON MACHINE LEARNING METHODS

Sultanbek Sanzhar

Scientific supervisor:

Serbin V.V.

Candidate of Technical Sciences, Associate Professor of the International Information Technologies Univesity, Almaty

Annotation. *The research article introduces an approach to describing machine learning methods for predicting customer churn in a telecommunications operator. It outlines parameters characterizing the interaction between the mobile operator and end-users, identifying those with the most significant influence on customer decisions to churn. The novelty of the approach lies in utilizing mathematical methods to pinpoint the primary set of parameters driving specific subscribers to switch mobile operators. This proposed approach enables the organization of a system to identify key parameters indicating customer churn tendencies and intervene with various methods to enhance subscriber loyalty. A comparative analysis of results obtained using logistic regression, initial load aggregation, and random forest methods showed that the prediction error rate does not exceed 6%. However, the advantage of the random forest method lies in its ability to identify the parameter set contributing the most to a subscriber's decision to switch mobile operators. Thus, for analyzing customer loyalty, the random forest method is recommended, demonstrating an increase in prediction accuracy by 6-7% in the test dataset.*

I. INTRODUCTION

In the competitive environment of mobile communications in Kazakhstan, operators must constantly offer the most favorable terms of service to retain subscribers, since the cost of retaining customers is significantly less than attracting new ones. Telecommunications companies analyze the parameters of subscribers' use of services to identify factors affecting outflow and assess future outflow risks. Machine learning methods are used due to the complexity of the data, but choosing the appropriate method remains a challenge. To understand the reasons for the outflow of subscribers, an experiment was conducted on the data of one of the largest mobile operators in Kazakhstan. The experiment included two stages: identifying the causes of outflow and compiling a list of subscribers at risk with influential parameters. The structure of the article includes an analysis of the outflow of subscribers, a review of data, proposed evaluation metrics, forecasting results and final recommendations [1].

The experiment is structured into two phases. Initially, the focus is on identifying the factors prompting subscribers to discontinue specific services. Subsequently, attention shifts to creating a roster of potentially churn-prone subscribers, detailing the probability percentage and the pivotal parameters guiding their decision-making process. In terms of the article's organization, Section 2 delves into analyzing subscriber attrition across various service providers. Section 3 offers a comprehensive examination of the dataset provided by a prominent mobile operator. Section 4 delineates the metrics for the proposed evaluation method, emphasizing parameters crucial in designing classifiers. Section 5 unveils the outcomes of predicting subscriber churn from

the mobile operator. Section 6 encapsulates conclusions drawn and provides recommendations for future endeavors.

II. CURRENT STATUS AND BACKGROUND

Machine learning algorithms used to analyze customer churn and other tasks in various companies are considered [2]. For example, [3] and [4] describe the use of methods such as logistic regression, decision tree, and neural networks to analyze Internet services. The results show that the logistic regression model demonstrates a high prediction accuracy of 89% with a sensitivity of 91%.

Some financial institutions in Kazakhstan and the CIS countries use modern data storage and processing platforms to analyze social networks, assess creditworthiness and predict customer churn. However, the issue of determining the key parameters affecting the current situation remains unresolved.

To obtain an adequate solution, it is necessary to consider various indicators, methods of data collection and processing, and the choice of the best parameters for models. Machine learning methods such as decision trees, random forest and k-means show the best results in solving such problems, having the ability to process data with many features and classes.

III. DATA

The analysis of subscriber data within a telecommunication network presents various challenges and considerations that demand careful attention.

A crucial aspect involves categorizing parameters into distinct groups to facilitate a structured analysis. The primary group encompasses general subscriber characteristics, providing foundational information about individuals within the network. Conversely, the secondary group comprises data pertaining to subscriber activities within the network, encompassing both quantitative and qualitative metrics [5].

The heterogeneous nature of these data sets poses a significant challenge. Operators must navigate through numerical and qualitative data while addressing instances of missing data [6]. It is imperative to adopt a standardized approach to handling missing values, typically by substituting them with zeros. This practice effectively communicates instances of non-utilization of services or the absence of pertinent information.

Furthermore, the presence of redundant data complicates the analysis process. Identifying and filtering out superfluous information is essential to ensure the accuracy and reliability of analytical outcomes [7]. By eliminating redundant data points, operators can streamline the analysis process and mitigate the risk of erroneous conclusions.

In essence, analyzing subscriber data necessitates a meticulous approach that encompasses data categorization, handling missing values, and identifying redundant information [8]. Through diligent adherence to these principles, operators can derive meaningful insights into network performance and make informed strategic decisions.

IV. METRICS

In machine learning tasks to assess the quality of the models and comparison of different algorithms using the following metrics:
– Accuracy,
– Precision,
– Recall,
– Integrated indicator F-measure.

Accuracy

A dataset is a dimension table m, which consists of parameters where i = 1, m. Each i-th parameter in the row pi of the table takes some values. Thus, each row in the table corresponds to the k-th, where k = 1, n, the state of the process, which is analyzed.

In the simplest case, such a metric may be the fraction of states of a set of parameters on which the classifier has made the correct decision.

Accuracy = $\frac{P}{N}$,

Where, P – number of states of a set of parameters for which the classifier has made the correct decision,

N – the size of the training sample.

In this metric, it's crucial to consider a particular aspect: the equal weighting assigned to all parameters. This approach may prove inaccurate if the distribution of parameters within the training sample heavily favors one or more classes. When such a skew exists, the classifier possesses more information about these dominant classes, resulting in a bias towards solutions that are optimal within those classes [10]. Consequently, the metric accuracy becomes ambiguous across different classes, with discrepancies ranging from high percentages in certain classes to nearly zero in others.

To address this issue, training the classifier on a carefully balanced sample of parameter groups is necessary. However, this solution comes with its own drawback: the loss of information regarding the relative frequency of parameter value changes.

Precision and recall are key metrics utilized in algorithms that require pre-aggregated data as input. They are often employed separately or serve as the foundation for derived metrics like the F-measure.

Precision reflects the accuracy of a system within a given class, indicating the proportion of correctly classified instances within that class compared to all instances classified into that class by the system. On the other hand, recall measures the completeness of the system by indicating the proportion of correctly classified instances within a class compared to all instances belonging to that class in the test sample.

The classifier divides the entire set of samples into four categories:

True Positives (TP): Samples correctly identified as belonging to the positive class by the classifier.

False Positives (FP): Samples incorrectly classified as belonging to the positive class by the classifier.

True Negatives (TN): Samples correctly identified as not belonging to the positive class by the classifier.

False Negatives (FN): Samples incorrectly classified as not belonging to the positive class by the classifier.

The precision and recall values are determined based on the distribution of these categories.

$$\text{Precision} = \frac{TP}{TP+F}$$

$$\text{Recall} = \frac{TP}{TP+F}$$

The F-measure, which evaluates the effectiveness of binary classifiers, is derived from precision and recall parameters. It serves as a combined metric to balance both precision and recall, providing a comprehensive assessment of classifier performance.

Achieving high precision and recall simultaneously is often challenging in real-world scenarios. Hence, it's essential to strike a balance between these two metrics. To simplify decision-making, it's advantageous to utilize a universal metric that integrates both precision and recall information. This metric, known as the F-measure, serves this purpose [10].

The F-measure computes the harmonic mean of precision and recall values. When precision and recall approach zero, the F-measure tends towards zero as well.

$$F = 2 * \frac{\text{precision} * \text{recall}}{\text{precision} + \text{recall}}$$

Adjusting the F-measure by assigning different weights to precision and recall is feasible if one metric holds higher priority during algorithm development.

$$F\,\beta = (1 + \beta^2) * \frac{\text{precision} * \text{recall}}{(\beta^2 * \text{precision}) + \text{recall}}$$

When β falls within the range $0 < \beta < 1$, precision is prioritized, while values of $\beta > 1$ prioritize recall. For $\beta = 1$, the F-measure equals the balanced F-measure as previously discussed. This metric serves as a formal assessment tool for classifier quality, condensing precision and recall into a single numerical value. Simplifying the evaluation process, it aids in decision-making regarding subscriber churn.

In addressing classification challenges with diverse data, the prominent method in machine learning is the utilization of Random Forests. These forests amalgamate random trees, where each tree hinges on the values of a random vector selected individually and sharing the same distribution across all forest trees. As the number of trees in the forest escalates, the generalization error tends towards a limit. This error hinges on the influence degree of individual trees' generalized indicators and their correlation. Internal estimates regulate the error,

influence degree, and correlation, serving to guide the forest's growth and measure variable importance.

The construction algorithm of Random Forests unfolds in several stages:

In stage 1, a subset of the training sample, of a specified size, is selected, and a tree is constructed upon it—each tree having its own distinct subset. In stage 2, for each split within the tree (where multiple branches emanate from a single node), the maximum number of random features is scanned, with each split having its own set of random features. In Stage 3, the best feature is selected for splitting, and the split is executed based on a predetermined criterion. Typically, a tree is built until the sample is depleted, i.e., only representatives of a single class remain in the leaves. However, modern implementations include parameters limiting tree height, leaf object count, and subsample object count for splitting.

This algorithm facilitates the identification of features that contribute most significantly, given that known feature values are available at each node.

For evaluating the efficacy of predicting subscriber churn, we compare the following mathematical methods:

1. Logistic Regression
2. Bootstrap Aggregating
3. Random Forest

Utilizing the Python programming language and libraries such as Pandas, Numpy, Sklearn, and Matplotlib, we construct prediction models for subscribers. Sklearn offers pre-built algorithms for model construction, while Numpy is employed for data cleaning, structuring, and redundancy elimination. Matplotlib aids in visualizing and graphing results for further analysis and decision-making on each subscriber.

Traditionally, solving the customer churn problem entails:

1. Identifying subscribers likely to churn soon.
2. Determining reasons for customer churn.
3. Devising cost-effective measures for customer retention.

These steps guide efforts to retain valuable customers and enhance service quality.

The outcomes of subscriber churn prediction, alongside an assessment of their accuracy and reliability across various algorithms, are presented in Table 3 and Figure 1. Analyzing these results yields the following insights: the hypothesis method demonstrates superior mid-term efficacy, achieving up to 6% higher metrics compared to common methods, showcasing improved accuracy, completeness, and prediction precision.

Among machine learning methods, Random Forest exhibits the most promising results, as depicted in Table 3, showcasing the influence of telecommunication network parameters on subscriber churn. Table 4 illustrates prediction outcomes for the test sample using the Random Forest method, detailing correctly and incorrectly estimated data, as well as first and second-order errors.

Identification of pivotal parameters impacting subscriber churn was conducted via the characteristic curve (ROC-analysis), portraying the results of binary classification scenarios when the model predicts the likelihood of subscriber churn.

Model	Logistic Regression	Bootstrap aggregating	Random Forest
Precision	0,709	0,803	0,815
Recall	0,728	0,75	0,7586
F1	0,718	0,776	0,786
F0.5	0,713	0,792	0,804
Accuracy	0,7156	0,7684	0,7776

Table 3. *The metric values acquired for the examined methods of forecasting customer churn.*

	Actual False	Actual True
importance	2046	463
labels	649	1842

Table 4. *Split set for random forest*

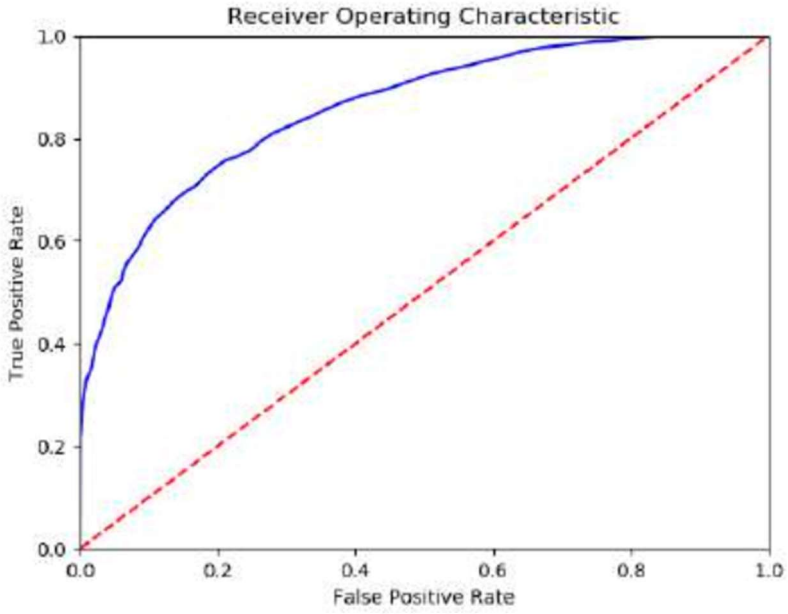

Figure 1. *ROC graph for Random Forest*

Subscriber ID	Churn Probability
13784	1.000000
12763	1.000000
17293	0.914286
10610	1.000000
10555	1.000000
20457	0.876543
30984	0.934211
21567	0.989899
30126	0.712345
40895	0.856789
13784	1.000000
12763	1.000000
17293	0.914286

Table 4. *List of subscribers prone to churn, along with their churn probabilities*

These subscribers have been identified as having a high likelihood of churning based on their churn probabilities. This information can be instrumental in developing targeted retention strategies to mitigate churn and enhance customer satisfaction.

CONCLUSIONS

In conclusion, this paper presents a methodological approach aimed at understanding subscriber churn within the telecommunications industry, leveraging the capabilities of machine learning algorithms. Through meticulous analysis, a comprehensive set of subscriber data within the telecommunications network was identified, forming the cornerstone for subsequent learning and predictive modeling processes.

Of particular note, the Random Forest machine learning technique emerged as the standout performer, exhibiting a notable improvement of 6-7% in predictive accuracy compared to conventional methods such as logistic regression and Bootstrap aggregating. This underscores the efficacy of advanced analytics in tackling complex business challenges like customer churn.

The outcomes of this study extend beyond mere identification of churn-prone subscribers. They pave the way for a deeper understanding of the underlying factors driving customer attrition, facilitating the implementation of targeted retention strategies. By swiftly identifying subscribers at risk of defection and pinpointing the root causes of dissatisfaction, telecommunications operators can take proactive measures to mitigate churn and bolster customer loyalty.

Looking ahead, future research endeavors will focus on further refining predictive models to enhance their accuracy and completeness. Additionally, efforts will be directed towards developing and implementing tailored retention measures designed to address the specific needs and preferences of individual subscribers. Through continuous innovation and refinement, the telecommunications industry can navigate the challenges of customer churn more effectively, fostering sustainable growth and competitiveness in the dynamic marketplace.

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RATIONALE FOR CHICKPEA PROCESSING PARAMETERS FOR THE PRODUCTION OF GLUTEN-FREE FLOUR

Mereke Agedilova
PhD, Associate Professor
Zhanar Botbayeva
Corresponding author, PhD, Associate Professor
Aigul Omaraliyeva
PhD, Associate Professor
Department of Technology and Standardization, JSC «K. Kulazhanov Kazakh University of Technology and Business»
Kayym-Mukhamedkhanova str.,37a, Astana, Republic of Kazakhstan, 010000

Despite the fact that today there is a great demand for gluten-free products and their wide selection, it is a problem for the baking industry to produce such a product of appropriate quality, since gluten plays an important role in the production of baked goods, cookies, cakes, pastries and, of course, bread. Most people with gluten intolerance or celiac disease associate gluten with wheat and wheat flour, but the adjacent prolamins are also found in barley, rye, oats, and triticale, a wheat hybrid. The organoleptic properties that gluten provides are key. There is a hypothesis that a huge amount of information about the possible dangers of gluten was specifically promoted through the media to promote new products without it.

Gluten bread is extremely harmful for people with celiac disease, which is why a scientific paper is dedicated to researching Chickeat flour.

Despite the prevalence of the celiac disease among the child population 1:262 [1, 2], this issue is not given due attention in Kazakhstan. Imported gluten-free products of unknown quality offered on the Kazakhstan market are sold at inflated prices [1-6].

Analysis of the studied indicators of leguminous crops revealed that legumes are characterized by a high content of protein, fat, and minerals [3–5].

Numerous studies are being conducted on the heat treatment of grain crops to increase their nutritional value. However, studies on the ultra-high-frequency processing of leguminous crops of Kazakhstan selection are not numerous yet. In this regard, it is advisable to investigate the issue of ultra-high-frequency processing of raw materials that could make it possible to obtain high-quality products, stabilize the output of the finished product, and increase its shelf life. At the same time, it is important to define the optimal modes of ultra-high-frequency processing of raw materials in order to study the influence of treatment time on the quality indicators of the protein fraction, as well as the nutritional and biological value of the chickpea variety Miras 07.

Results of studying the effect of ultra-high-frequency processing on the nutritional and biological value of chickpea flour.

The organoleptic indicators of chickpea flour were studied before and after ultra-high-frequency treatment, shown in Table 1. Based on the organoleptic indicators (Table 1), we can conclude that with ultra-high-frequency treatment for 180 seconds, the bean taste and smell of chickpeas are suppressed, they acquire a pleasant aroma, characteristic of roasted seeds.

Table 1. Organoleptic indicators chickpeas before and afterultrahigh-frequency processing

Indicator	Chickpeas before treatment	Treated chickpeas		
		60 seconds	180 seconds	300 seconds
Color	White-yellow	White-yellow	Yellowish	Yellowish with a brown tint
Smell	Pronounced smell of legumes	The smell of fresh chickpeas	The smell of roasted nuts	The smell of heavily roasted walnut
Taste	Characteristic taste without foreign tastes (not sour), not bitter	Characteristic weakly fried without foreign tastes	The taste of roasted chickpeas with a nutty flavor	Highly fried taste

So that, our studies have confirmed effectiveness of the ultra-high-frequency chickpea processing for 180 seconds, at which biochemical processes in the treated product are intensified due to the resonant absorption of energy by protein molecules and polysaccharides. At the ultra-high-frequency processing of chickpeas for 180 seconds, up to 20 % of the starch contained in the grain passes into dextrin, which is easily absorbed by humans while the toxic substances are destroyed. There is a slight denaturation of the protein.

The change in the protein fraction of chickpeas during ultrahigh-frequency processing was determined. When ultra-high-frequency processing of chickpea flour for 180 seconds, the content of the protein fraction remains unchanged - 79.8% [6].

Conclusions

Based on our chemical analysis, it was found that during ultra-high-frequency processing for 180 seconds, the vitamin and mineral complex is completely preserved compared to non-treated chickpeas. Under the influence of ultra-high-frequency processing, there is a decrease in the microbiological contamination of raw materials while the organoleptic indicators improve. According to the microbiological indicators of chickpea flour, the content of microorganisms was 1×103 CFU/g, which meets the requirements for sanitary and hygienic safety.

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Architecture

Проблемы региональной и национальной архитектуры в Кабуле, Афганистан

Сарвари Мохаммад Риаз
магистрант
Самойлов Константин Иванович
доктор архитектуры, профессор, Кафедра архитектуры Сатбаев Университет, Алматы, Республика Казахстан

Абстрактный:
Архитектура, искусство и наука проектирования и строительства зданий и других физических сооружений, глубоко переплетена с культурной, социальной и экономической тканью регионов и стран. Хотя архитектурные чудеса часто поражают воображение своей красотой и функциональностью, эта область также сталкивается с многочисленными проблемами, возникающими как на региональном, так и на национальном уровне. Сложности, с которыми сегодня сталкиваются архитекторы, многогранны: от баланса между сохранением наследия и современным развитием до устранения социально-экономического неравенства.

1. Введение

Кабул, столица Афганистана, является свидетелем богатой истории, культуры и традиций. Однако среди его яркого наследия скрывается множество архитектурных проблем, которые влияют как на регион, так и на страну. Архитектурный ландшафт Кабула, от шрамов конфликта до быстрой урбанизации и деградации окружающей среды, отражает сложности, с которыми сталкивается город и его жители.

Сохранение против прогресса

Одной из основных дилемм региональной и национальной архитектуры является противоречие между сохранением исторического наследия и современным развитием. Многие регионы могут похвастаться архитектурными сокровищами, которые служат свидетельством их богатой культурной истории. Однако быстрая урбанизация и экономический рост часто приводят к разрушению или изменению этих объектов наследия в пользу современных построек. Поиск баланса между уважением к прошлому и принятием будущего — деликатная задача, требующая тщательного планирования, инновационных дизайнерских решений и участия сообщества.

1. Социально-экономические различия

Архитектура отражает и увековечивает социально-экономические различия внутри регионов и стран. Во многих городских районах богатые районы могут похвастаться роскошными небоскребами и современной инфраструктурой, в то время как бедные общины страдают от неадекватного жилья, некачественных условий жизни и пренебрежения инфраструктурой.

Устранение этих различий требует от архитекторов принятия более инклюзивного подхода, который отдает приоритет справедливому доступу к качественному жилью, общественным местам и основным услугам для всех слоев общества. Это требует сотрудничества с градостроителями, политиками и заинтересованными сторонами сообщества для создания целостных решений, которые способствуют социальной справедливости и расширению экономических возможностей.

3. Культурная идентичность и глобализация

По мере ускорения глобализации региональная и национальная идентичность рискуют быть омрачены гомогенизированными архитектурными стилями и международными тенденциями. Распространение типовых, типовых зданий подрывает уникальный характер и ощущение места, которые определяют сообщества. Архитекторы должны стремиться прославлять местную культуру, традиции и народную архитектуру в своих проектах, воспитывая у жителей чувство гордости и принадлежности. Принятие разнообразия и содействие культурному обмену могут обогатить архитектурный ландшафт, создавая яркую и инклюзивную среду, которая находит отклик у людей самого разного происхождения.

3. Конфликт и реконструкция

Десятилетия конфликта оставили неизгладимые следы в архитектурном наследии Кабула. Город пережил разрушение бесчисленных зданий, памятников и инфраструктуры, оставив после себя шрамы войны, которые служат постоянным напоминанием о прошлых потрясениях. Усилия по восстановлению часто сталкиваются с серьезными проблемами, включая ограниченность ресурсов, бюрократические препятствия и проблемы безопасности. Восстановление архитектурной ткани Кабула требует не только физического восстановления, но и залечивания социальных и психологических ран, нанесенных десятилетиями насилия.

4. Урбанизация и нагрузка на инфраструктуру

Быстрая урбанизация привела к огромной нагрузке на инфраструктуру Кабула, что привело к перенаселенности, пробкам на дорогах и неадекватным общественным услугам. Неформальные поселения стали быстро распространяться, поскольку сельские мигранты стекаются в города в поисках новых возможностей, что усугубляет нехватку жилья и истощает ресурсы. Отсутствие комплексного городского планирования привело к бессистемной застройке: ландшафт был разбросан временными постройками рядом с современными высотными зданиями. Решение этих проблем требует целостных стратегий городского проектирования, которые отдают приоритет устойчивому развитию, справедливому доступу к жилью и эффективному обеспечению инфраструктуры.

5. Сохранение культурного наследия

Кабул может похвастаться богатым культурным наследием, насчитывающим многовековую историю, включая исторические места, мечети и базары, которые служат столпами афганской идентичности. Однако многие из этих сокровищ находятся под угрозой из-за пренебрежения, вторжения городов и разрушительного действия времени. Усилиям по сохранению препятствуют ограниченное финансирование, недостаточный опыт и продолжающаяся ситуация с безопасностью. Возрождение культурного наследия Кабула не только сохраняет его прошлое, но и способствует развитию чувства гордости и принадлежности среди его жителей, служа катализатором социальной сплоченности и экономического развития.

6. Социальная справедливость и инклюзивный дизайн

Социально-экономическое неравенство преследует Кабул, с резким неравенством между богатыми районами и маргинализированными сообществами. Доступ к качественному жилью, образованию, здравоохранению и общественным местам остается неравномерным, что увековечивает циклы бедности и изоляции. Архитекторы обязаны отстаивать инклюзивные принципы проектирования, которые ставят во главу угла потребности всех жителей, независимо от их социально-экономического статуса или происхождения. Это влечет за собой создание безбарьерной среды, которая способствует социальному взаимодействию, мобильности и благополучию, способствуя построению более справедливого и инклюзивного общества.

7. Экологическая устойчивость

Деградация окружающей среды представляет собой серьезную угрозу архитектурному ландшафту Кабула и здоровью населения. Уровни загрязнения воздуха и воды тревожно высоки, что усугубляется бесконтрольным расширением городов, неадекватным управлением отходами и зависимостью от ископаемого топлива. Изменение климата еще больше усугубляет эти проблемы, поскольку увеличивается частота экстремальных погодных явлений, таких как наводнения и засухи. Интеграция принципов устойчивого дизайна в городское планирование и архитектурную практику имеет решающее значение для смягчения воздействия на окружающую среду и повышения устойчивости к рискам, связанным с климатом.

8. Инклюзивный дизайн: содействие равенству и доступности

Социально-экономические различия вырисовываются в Кабуле, с резким неравенством между различными слоями населения. Доступ к жилью, образованию, здравоохранению и общественным местам остается неравномерным, что увековечивает циклы бедности и изоляции. Задача архитекторов — спроектировать пространства, которые были бы инклюзивными и доступными для всех, независимо от дохода или социального статуса. Это требует приверженности универсальным принципам проектирования, которые отдают приоритет потребностям наиболее уязвимых членов общества. Содействуя равенству и доступности, архитекторы могут сыграть жизненно важную роль в построении более справедливого и инклюзивного Кабула для будущих поколений.

9. Давление урбанизации: баланс между ростом и устойчивостью

Быстрая урбанизация превратила Кабул в шумный мегаполис, но она также довела его инфраструктуру до предела. Приток сельских мигрантов привел к перенаселенности, неформальным поселениям и неадекватным государственным услугам. Задача архитекторов и градостроителей состоит в том, чтобы сбалансировать требования роста с императивами устойчивого развития. Для этого необходимо представить себе город, который не только функционален, но и пригоден для жизни, с зелеными насаждениями, эффективными транспортными системами и доступом к основным услугам для всех жителей. Городское будущее Кабула зависит от его способности применять методы устойчивого развития, которые способствуют процветанию, не жертвуя при этом благополучием граждан или окружающей средой.

Заключение:

В заключение отметим, что архитектурные проблемы Кабула глубоко переплетены с его историческим наследием, социально-экономической динамикой и экологическим контекстом. Решение этих проблем требует согласованных усилий со стороны государственных органов, градостроителей, архитекторов и заинтересованных сторон. Сохраняя культурное наследие, способствуя устойчивому развитию, повышая социальное равенство и укрепляя устойчивую инфраструктуру, Кабул может стать маяком устойчивости и обновления перед лицом невзгод. Благодаря совместным действиям и дальновидному руководству город может вернуть себе законное место яркого культурного центра и процветающего городского центра. область региональной и национальной архитектуры сталкивается с множеством проблем, которые требуют творческого мышления, междисциплинарного сотрудничества и приверженности социальной и экологической ответственности. Решая проблемы сохранения, преодолевая социально-экономические различия, продвигая устойчивость, сохраняя культурную самобытность и удовлетворяя потребности в инфраструктуре, архитекторы могут внести свой вклад в построение более справедливого, устойчивого и гармоничного мира. Благодаря инновациям и добросовестному подходу к проектированию архитектурное сообщество может сформировать светлое будущее для будущих поколений.

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Архитектура повышения энергоэффективности в Кабуле, Афганистан

Сарвари Мохаммад Риаз
магистрант
Самойлов Константин Иванович
доктор архитектуры, профессор, Кафедра архитектуры Сатбаев Университет, Алматы, Республика Казахстан

Абстрактный:
Кабул, шумная столица Афганистана, сталкивается с уникальным набором проблем, включая нехватку энергии, деградацию окружающей среды и быструю урбанизацию. Поскольку город стремится к устойчивому развитию, энергоэффективность в архитектуре становится важнейшим средством смягчения этих проблем, одновременно создавая более устойчивую и пригодную для жизни городскую среду. Вот более пристальный взгляд на то, как энергоэффективная архитектура может сыграть преобразующую роль в городском ландшафте Кабула.

1. Введение

Дефицит энергии является острой проблемой в Кабуле: частые отключения электроэнергии нарушают повседневную жизнь жителей и предприятий. Использование энергоэффективного архитектурного проектирования предлагает путь к решению этой проблемы за счет снижения зависимости города от традиционных источников энергии. Стратегии пассивного проектирования, такие как ориентация зданий для максимального увеличения естественного освещения и вентиляции, могут значительно снизить потребность в искусственном освещении и кондиционировании воздуха, тем самым снижая потребление энергии и эксплуатационные расходы.

Адаптивный к климату дизайн:

Климат Кабула характеризуется жарким летом и холодной зимой, что представляет собой серьезную проблему для архитектурного проектирования. Энергоэффективные здания используют принципы проектирования, чувствительные к климату, для оптимизации теплового комфорта при минимизации энергопотребления. Это может включать в себя включение таких функций, как высокоэффективная изоляция, тепловая масса и устройства затенения для регулирования температуры в помещении и снижения нагрузки на отопление и охлаждение. Адаптируясь к местным климатическим условиям, энергоэффективная архитектура повышает комфорт жильцов и снижает зависимость от механических систем отопления и охлаждения.

1. Интеграция возобновляемых источников энергии

Интеграция технологий возобновляемых источников энергии в проектирование зданий является краеугольным камнем энергоэффективной архитектуры. Обилие солнечного света в Кабуле делает солнечные фотоэлектрические (PV) системы особенно жизнеспособными

для производства экологически чистой электроэнергии. Архитекторы могут встраивать солнечные панели в фасады зданий, крыши или отдельные конструкции, чтобы использовать солнечную энергию для освещения, отопления и питания приборов. Кроме того, методы пассивного солнечного проектирования, такие как проектирование зданий с окнами, выходящими на юг, для улавливания солнечного света в зимние месяцы, могут еще больше повысить энергоэффективность и снизить зависимость от невозобновляемых источников энергии.

2. Ресурсоэффективное строительство

Энергоэффективная архитектура выходит за рамки эксплуатационных соображений и охватывает весь жизненный цикл здания, включая строительство и материалы. Внедрение устойчивых методов строительства, таких как использование местных материалов, применение эффективных строительных технологий и минимизация образования отходов, может значительно уменьшить воздействие зданий на окружающую среду в Кабуле. Кроме того, программы сертификации экологически чистых зданий, такие как LEED (Лидерство в энергетическом и экологическом проектировании), обеспечивают основу для оценки и признания зданий, которые демонстрируют исключительные энергетические характеристики и охрану окружающей среды.

3. Вовлечение сообщества и наращивание потенциала

Продвижение энергоэффективности в архитектуре требует сотрудничества между архитекторами, градостроителями, политиками и местными сообществами. Инициативы по вовлечению сообщества могут повысить осведомленность о преимуществах энергоэффективного дизайна и дать жителям возможность применять устойчивые методы в своих домах и на рабочих местах. Программы по наращиванию потенциала, такие как учебные семинары и образовательные кампании, дают архитекторам и специалистам в области строительства знания и навыки, необходимые для эффективной интеграции принципов энергоэффективности в их проекты.

4. Политическая поддержка и стимулы:

Государственная политика и стимулы играют решающую роль в стимулировании и продвижении энергоэффективной архитектуры. В Кабуле политики могут внедрять строительные нормы и стандарты, устанавливающие требования к энергоэффективности при новом строительстве и реконструкции. Кроме того, финансовые стимулы, такие как налоговые льготы, гранты и субсидии, могут побудить застройщиков и владельцев зданий инвестировать в энергоэффективные технологии и методы. Создавая благоприятную нормативно-правовую среду, политики могут стимулировать внедрение энергоэффективной архитектуры и ускорить прогресс в достижении целей устойчивого развития.

5. Продвижение принципов пассивного дизайна

Принципы пассивного дизайна используют природные элементы, такие как солнечный свет, тень и вентиляция, для повышения теплового комфорта и уменьшения зависимости от механических систем отопления и охлаждения. Архитекторы в Кабуле могут проектировать здания с ориентацией, устройствами затенения и тепловой массой, чтобы оптимизировать естественное освещение и вентиляцию, одновременно сводя к минимуму приток и потери тепла. Стратегии пассивного дизайна не только повышают энергоэффективность, но и повышают комфорт и благополучие жильцов.

6. Интеграция технологий возобновляемой энергетики

Обилие солнечного света в Кабуле делает солнечную энергию привлекательным вариантом для производства экологически чистой электроэнергии. Интеграция солнечных фотоэлектрических (PV) панелей в конструкцию зданий, как на крышах, так и в виде отдельных установок, может компенсировать спрос на энергию и снизить зависимость от ископаемого топлива. Кроме того, солнечные водонагреватели могут обеспечить горячую воду для жилых и коммерческих зданий, что еще больше снижает потребление энергии и выбросы углекислого газа.

7. Использование высокоэффективных строительных материалов

Использование высокоэффективных строительных материалов может повысить энергоэффективность и долговечность архитектуры Кабула. Изоляционные материалы, такие как пенополистирол (EPS) и минеральная вата, могут улучшить теплоизоляцию и уменьшить теплопередачу через стены и крышу. Окна с низким коэффициентом излучения (low-e) могут минимизировать потери тепла зимой и предотвратить приток тепла летом, улучшая общие характеристики здания.

8. Обучение архитекторов, инженеров и подрядчиков

Инициативы по обучению и наращиванию потенциала могут дать архитекторам, инженерам и подрядчикам в Кабуле знания и навыки, необходимые для проектирования и строительства энергоэффективных зданий. Семинары, семинары и программы сертификации могут предоставить профессионалам практические рекомендации по внедрению энергоэффективных стратегий и технологий в их проекты. Инвестируя в профессиональное развитие, Кабул может вырастить квалифицированную рабочую силу, способную внедрять инновации в устойчивую архитектуру. Обеспечение соблюдения строительных энергетических норм и стандартов имеет важное значение для обеспечения того, чтобы новые строительные проекты в Кабуле отвечали минимальным требованиям энергоэффективности. Установление четких рекомендаций по характеристикам ограждающих конструкций зданий, систем отопления, вентиляции и кондиционирования, освещения и бытовой техники может стимулировать внедрение энергоэффективных практик и технологий. Регулярные проверки и мониторинг соответствия имеют решающее значение для соблюдения этих стандартов и обеспечения долгосрочной устойчивости искусственной среды.

9. Повышение осведомленности и участия общественности

Повышение осведомленности общественности о преимуществах энергоэффективности и устойчивости имеет важное значение для стимулирования спроса на зеленые здания в Кабуле. Образовательные кампании, информационно-просветительские мероприятия и демонстрационные проекты могут продемонстрировать ощутимые преимущества энергоэффективного проектирования жителям, предприятиям и политикам. Вовлечение общественности в переход к устойчивой архитектуре способствует развитию чувства сопричастности и коллективной ответственности за строительство более зеленого и устойчивого города. Значительная часть застроенной среды Кабула состоит из старых построек, в которых могут отсутствовать энергоэффективные функции. Модернизация этих зданий изоляцией, эффективными окнами и энергосберегающими приборами может значительно снизить потребление энергии и эксплуатационные расходы. Государственные стимулы и механизмы финансирования могут побудить владельцев зданий инвестировать в повышение энергоэффективности, что в конечном итоге повысит комфорт и доступность существующих зданий.

Заключение:

В заключение, повышение энергоэффективности в архитектуре Кабула имеет важное значение для решения проблемы нехватки энергии, снижения воздействия на окружающую среду и содействия устойчивому городскому развитию. Модернизируя существующие здания, продвигая принципы пассивного проектирования, интегрируя технологии возобновляемых источников энергии, используя высокоэффективные строительные материалы, внедряя строительные энергетические кодексы, обучая специалистов и повышая осведомленность общественности, Кабул может ускорить прогресс на пути к более устойчивому и пригодному для жизни городу. Благодаря совместным усилиям и инновациям Кабул имеет возможность подавать пример и вдохновлять позитивные изменения в более широком регионе.

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Влияние пешеходных зон на физическую активность жителей города Алматы

Ахмедова Айжан Тимуровна

Доктор архитектуры, Академический профессор, кафедра дизайна. Международная Образовательная Корпорация (Казахская головная архитектурно-строительная академия) (г. Алматы, Казахстан) ORCID ID: 0000-0003-3736-6543

Сарсенова Наргиз Мухтаркызы

Магистрант, Международная Образовательная Корпорация (Казахская головная архитектурно-строительная академия) (г. Алматы, Казахстан)преподаватель Колледжа-Школы КазГАСА, (г. Алматы, Казахстан) ORCID ID: 0009-0004-7258-0953

Аннотация: *Исследование влияния пешеходных зон на физическую активность жителей города Алматы представляет собой актуальную задачу в контексте улучшения общественного здоровья и благополучия городского населения Данное исследование направлено на анализ уровня физической активности жителей Алматы до и после создания пешеходных зон, выявление изменений в привычках и поведении людей в связи с появлением новых пространств для отдыха и занятий спортом. Методы сбора данных включают опросы жителей, наблюдения за использованием общественных мест, анализ статистических данных о здоровье горожан.*
Во времена быстрой урбанизации здоровье и благополучие граждан все чаще признаются как проблема. Было проведено значительное количество исследований взаимосвязи между городской средой и здоровьем и благополучием. Предполагается, что создание пешеходных зон в городе Алматы может способствовать улучшению общественного здоровья и качества жизни его жителей.

Ключевые слова: *Рекреационные пространства, дизайн, архитектура, пешеходные зоны, Физическая активность, городское пространство, планирование города, качество жизни.*

ВВЕДЕНИЕ

Для изучения влияние пешеходных зон на физическую активность жителей Алматы будет использована комплексная методология исследования. Это будет включать опросы, интервью с жителями города, Жить в «здоровом обществе» — мечта каждого. Однако сегодняшние городские пространсва все чаще строятся вокруг автомобилей, а не пешеходов. Такие автоориентированные сообщества подвергались сомнению и критике за их влияние на физическое и социальное здоровье жителей.

Городская среда играет решающую роль в формировании образа жизни и уровня физической активности его жителей. В последние годы город Алматы переживает стремительную урбанизацию, и, как следствие, важно понимать, как архитектурные особенности улиц и пешеходных зон влияют на физическую активность его жителей. Цель этой статьи - углубиться в различные аспекты городского дизайна и их влияние на популяризацию физической активности среди населения города.

Алматы - динамичный город с уникальным городским ландшафтом, и изучение того, как его архитектурные особенности влияют на физическую активность его жителей, может дать ценную информацию для городского планирования и инициатив в области общественного здравоохранения.

Дизайн городских пространств может существенно влиять на уровень физической активности жителей города. Доступные и хорошо спроектированные пешеходные зоны, зеленые насаждения и места отдыха могут способствовать пешим прогулкам, езде на велосипеде и другим формам физических упражнений. И наоборот, плохо спроектированные улицы и отсутствие инфраструктуры, удобной для пешеходов, могут удерживать людей от занятий физической активностью [1].

Анализ доступности пешеходных зон в разных частях Алматы имеет решающее значение для понимания их влияния на физическую активность жителей. Такие факторы, как наличие тротуаров, безопасность пешеходных переходов и общий комфорт пешеходов, являются ва жными соображениями.

В области исследований, касающихся городов, доступных для пешеходов, Джейн Джейкобс [2] была одной из первых, кто пролил свет на развитие городов, подчеркнув необходимость соединять части городских территорий таким образом, чтобы они были разнообразными и умеренно сложными (рис. 1). «Проходимость» использовалась в нескольких разных значениях, например, с акцентом на особенности окружающей среды, на результаты, зависящие от этих особенностей, или как показатель лучшего дизайна [3].

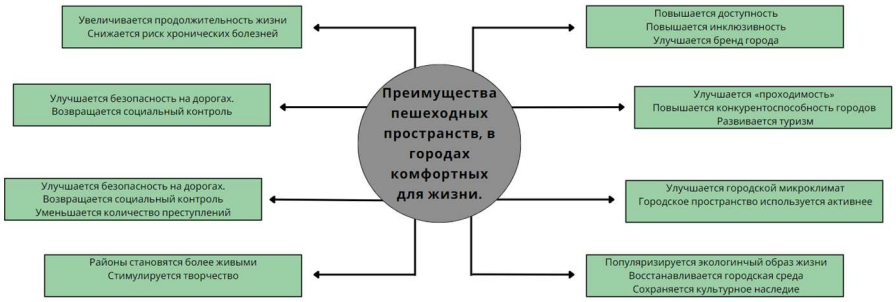

Рисунок 1 - Преимущества пешеходных пространств, в городах комфортных для жизни.

Теренкур в Алматы – это яркий пример того, как пешеходные зоны становятся неотъемлемой частью городской среды и почему они так важны (рис 2). Давайте рассмотрим основные аспекты необходимости пешеходных пространств на примере Теренкура:

1. Здоровье и благополучие:

- Физическая активность: Теренкур предоставляет возможность для занятий спортом и прогулок на свежем воздухе, что способствует улучшению физического здоровья и снижению риска развития сердечно-сосудистых заболеваний, диабета и ожирения.
- Психическое здоровье: Прогулки на природе и вдали от городского шума снижают уровень стресса, улучшают настроение и способствуют психологическому благополучию.
- Социальное взаимодействие: Теренкур – это место встреч и общения, где люди могут проводить время с семьей и друзьями, что способствует укреплению социальных связей.

2. Экологические преимущества:

- Сокращение выбросов: Поощрение пешеходного движения снижает использование автомобилей, что ведет к уменьшению выбросов вредных веществ в атмосферу и улучшению качества воздуха.
- Сохранение природных ресурсов: Теренкур проложен в горной местности, что позволяет сохранить естественную среду и биоразнообразие.

• Экологическое сознание: Пешеходные зоны способствуют формированию экологического сознания у горожан и пониманию важности сохранения окружающей среды.

3. Экономические выгоды:

• Развитие туризма: Теренкур является популярным туристическим объектом, что привлекает в город туристов и способствует развитию сферы услуг и экономики в целом.

• Повышение стоимости недвижимости: Наличие пешеходных зон рядом с жилыми комплексами повышает их привлекательность и стоимость недвижимости.

• Развитие малого бизнеса: Теренкур создает возможности для развития малого бизнеса, например, кафе, сувенирных лавок и пунктов проката спортивного инвентаря.

4. Культурное значение:

• Историческое наследие: Теренкур имеет богатую историю, связанную с развитием города и курортной зоны.

• Ландшафтный дизайн: Трасса Теренкура проходит через живописные места, что создает эстетическое удовольствие и способствует развитию ландшафтного дизайна.

• Место проведения мероприятий: Теренкур используется для проведения различных спортивных и культурных мероприятий, что обогащает жизнь горожан.

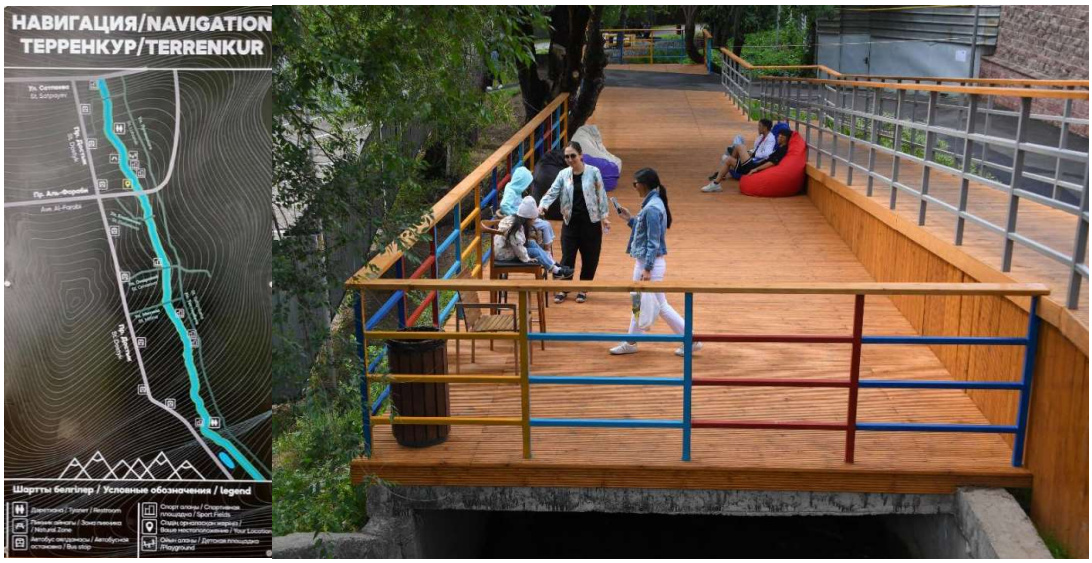

Рисунок 2 – Пешеходное пространство города Алматы, Теренкур.

Арбат в Алматы, также известный как улица Жибек Жолы, является ярким примером того, как пешеходная зона может преобразить городскую среду и почему такие пространства так необходимы. Рассмотрим основные аспекты:

1. Исторический и культурный центр:

• Сохранение наследия: Арбат – это исторический центр города, где расположены архитектурные памятники и культурные объекты. Пешеходная зона позволяет сохранить этот исторический облик и создать комфортное пространство для знакомства с наследием города.

• Место встречи и общения: Арбат – это популярное место для встреч и прогулок, где жители и гости города могут насладиться атмосферой, пообщаться и провести время с близкими.

• Культурные мероприятия: На Арбате регулярно проводятся различные культурные мероприятия: концерты, выставки, фестивали, что обогащает жизнь города и привлекает туристов.

2. Экономическое развитие:

- Развитие торговли и сферы услуг: Пешеходная зона привлекает множество людей, что способствует развитию торговли и сферы услуг: кафе, рестораны, магазины сувениров и др.
- Повышение стоимости недвижимости: Наличие пешеходной зоны рядом с жилыми комплексами и коммерческими объектами повышает их привлекательность и стоимость.
- Создание рабочих мест: Развитие бизнеса в пешеходной зоне способствует созданию новых рабочих мест.

3. Социальные преимущества:

- Безопасность: Отсутствие автомобильного движения создает безопасную среду для пешеходов, особенно для детей и пожилых людей.
- Социальное взаимодействие: Арбат способствует укреплению социальных связей и созданию чувства сообщества. Люди могут свободно общаться, знакомиться и проводить время вместе.
- Доступность для всех: Пешеходная зона обеспечивает доступность для людей с ограниченными возможностями, пожилых людей и семей с детьми.

4. Экологические преимущества:

- Сокращение выбросов: Отсутствие автомобилей снижает уровень загрязнения воздуха и шума, что улучшает экологическую обстановку в центре города.
- Зеленые зоны: На Арбате расположены зеленые зоны, которые создают комфортный микроклимат и способствуют улучшению качества воздуха.
- Популяризация экологичного образа жизни: Пешеходная зона способствует популяризации пеших прогулок и использования экологичного транспорта, что снижает нагрузку на окружающую среду.

5. Городской дизайн и эстетика:

- Архитектурный ансамбль: Пешеходная зона позволяет лучше увидеть и оценить архитектурный ансамбль исторического центра города.
- Ландшафтный дизайн: Арбат оформлен с использованием элементов ландшафтного дизайна, что создает эстетически привлекательную среду.
- Уличное искусство: Пешеходная зона предоставляет пространство для уличных художников и музыкантов, что добавляет яркости и разнообразия городской среде.

Рисунок 2 – Пешеходное пространство города Алматы, Арбат.

ЗАКЛЮЧЕНИЕ

Полученные результаты могут стать основой для стратегий городского проектирования, развития инфраструктуры и политики общественного здравоохранения, направленной на содействие физической активности и общему благополучию в городе.

В заключение, влияние архитектурных особенностей улиц и пешеходных зон на физическую активность жителей города Алматы является многогранным и важнейшим аспектом городского развития. Признавая влияние городского дизайна на физическую активность, города могут стремиться создавать среду, способствующую здоровому и активному образу жизни среди своих жителей, что в конечном итоге приведет к более динамичному и устойчивому городскому сообществу.

Это всестороннее исследование влияния архитектурных особенностей на физическую активность поможет проложить путь к будущим стратегиям городского развития, в которых приоритетное внимание уделяется благополучию и здоровью жителей Алматы.

В целом, Теренкур является прекрасным примером того, как пешеходные пространства способствуют улучшению качества жизни в городе, создавая возможности для здорового образа жизни, отдыха, общения и развития. Такие зоны становятся все более востребованными в современном мире, где люди стремятся к комфорту, экологичности и безопасности.

В целом, Арбат в Алматы демонстрирует, как пешеходные пространства могут положительно влиять на различные аспекты городской жизни: от экономики и экологии до социальной сферы и культуры. Такие зоны становятся неотъемлемой частью современных городов, стремящихся к комфорту, безопасности и устойчивому развитию.

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Bayatı, ağı və layla şeir şəkillərinin yazılı ədəbiyyat variantları

Məlahət Əhmədova
Azərbaycan Milli Elmlər Akademiyası, ORCID NO: 0009-0000-6273-8279

Yazılı ədəbiyyat bütün sahələrdə olduğu kimi janr yaradıcılığında da folklordan daim bəhrələnmişdir. Şifahi xalq ədəbiyyatında bəlli ölçü və prinsiplərə malik olan şeir şəkilləri yazılı ədəbiyyata keçdiyi zaman müəllif interpretasiyasına uyğun olaraq müəyyən dəyişikliklərə uğraya bilir. Bu dəyişiliklər kəskin, ciddi dəyişmələr olmaqla bərabər, cüzi və formal xarakter də daşıya bilər. Kəskin dəyişikliklərdə belə janr özünün ilkin, yəni folklor modelinin əsas xüsusiyyətlərini qoruyub saxlayır. Əks halda, yazılı ədəbiyyatda janr variantından yox, yeni janrdan bəhs edilməli olardı.

Bayatının yazılı ədəbiyyata gəlişi əsasən Molla Vəli Vidadinin adı ilə bağlıdır. Şifahi xalq ədəbiyyatının qoşma və gəraylı janrlarından ustalıqla istifadə edən şair bayatı şəklində də gözəl şeirlər yazmışdır. Onun cinaslı bayatıları xüsusilə seçilir. Maraqlıdır ki, Molla Pənah Vaqifin heca vəznli şeirlərindən tez-tez bəhs edilsə də, Vidadinin bu sahədəki çoxtərəfli fəaliyyəti, heca vəznli şeirlərinin spesifikası bir o qədər də öyrənilməmişdir. Şairin bayatıları müəllifin subyektiv yaşantılarını əks etdirsə də, forma və məzmun xüsusiyyətlərinə görə folklor janrından bir o qədər də fərqlənmir. Ənənəvi funksiyasına və poetik strukturuna yaxın şəkildə bayatılara müasir Azərbaycan poeziyasında da rast gəlirik. Qaçqınlıq dövründə xalq arasında çoxlu bayatı və ağı yaranmışdır. 20 yanvar hadisələri ilə bağlı həm xalq, həm də müəllif ağıları meydana gəldi. Əzizə Cəfərzadənin müəllif ağıları buna bariz nümunədir.

Bayatı və layla şeir şəklinin məzmun və funksiyasının transformasiyaya uğrmış variantları ənənəsi əsasən “Molla Nəsrəddin” jurnalından başladı. Burada layla və bayatılardan satirik transformasiyada istifadə olunmuşdur.

Açar sözlər: layla, baytı, transformasiya, yazılı variant, Molla Vəli Vidadi, heca vəzni

ƏDƏBİYYAT TƏLİMİNİN METODLARI VƏ ONLARDAN İSTİFADƏ YOLLARI

Bəybala Məmmədov Sultan
Azərbaycan Dövlət Pedaqoji Universiteti

Açar sözlər: *pedaqoji elm, təhsil prosesi, bədii yaradıcılıq, linqvistika*

Məqalədə bir elm kimi milli məktəblərdə ədəbiyyatın tədrisi metodikası təhlil edilir. Metodika ədəbiyyatın tədrisinin məqsəd və vəzifələrini müəyyən edir, öyrənilən fənnin məzmununu əsaslandırır, tədris prosesində müəllim və şagirdlərin fəaliyyətinin metod və üsullarını işləyib hazırlayır. Milli məktəblərdə ədəbiyyatın tədrisi metodikası yaxın elmlərlə: doğma ədəbiyyatın tədrisi metodikası, ədəbiyyatşünaslıq, dilçilik, pedaqogika, psixologiya, estetika ilə sıx bağlıdır. Azərbaycan məktəblərində, eləcə də digər milli məktəblərdə ədəbiyyatın tədrisinin səmərəliliyinin artırılması müəllimin Azərbaycan dili müəllimləri ilə sıx əməkdaşlıq şəraitində işləməsinin zəruriliyi ilə ayrılmaz şəkildə bağlıdır.

Keywords: *pedagogical science, educational process, artistic creativity, linguistics*

The article analyzes the methodology of teaching literature in national schools as a science. Methodology determines the goals and tasks of teaching literature, substantiates the content of the studied subject, develops methods and methods of the activity of teachers and students in the teaching process. The methodology of teaching literature in national schools is closely related to related sciences: the methodology of teaching native literature, literary studies, linguistics, pedagogy, psychology, aesthetics. Increasing the efficiency of teaching literature in Azerbaijani schools, as well as in other national schools, is inextricably linked with the need for the teacher to work in close cooperation with Azerbaijani language teachers.

Tədris metodlarının təsnifatı ilə bağlı konsensus yoxdur. Tədris metodlarını təsnif edərkən (onları qruplaşdırarkən) müxtəlif tədqiqatçılar müxtəlif səbəbləri vurğulayırlar. Bunlar əsasən aşağıdakılardır:

- bilik mənbəyinə görə (Məktəbin pedaqogikası, 1977);
- şagirdlərin idrak fəaliyyətinin xarakterinə görə (Orta məktəb didaktikası, 1975);
- təlim məqsədləri ilə (Pedaqogika, 1964);
- təlim mərhələləri üzrə və s. (Kazımov, Həşimov, 1996).

Müasir metodologiya elminin aşağıdakı nəzəri problemlərini müəyyən etmək olar:

1) bədii ədəbiyyatı söz sənəti kimi oxumaq, dərk etmək problemi; oxucunun, onun mənəvi dünyasının formalaşması.

2) Ədəbiyyatşünaslığın və ədəbiyyatın tədrisi metodlarının qarşılıqlı zənginləşməsi. Ədəbiyyat dərslərində bədii əsərin poetikasının öyrənilməsi problemləri və perspektivləri.

3) Əsərin qavranılması, onun şərhi, təhlili və tələbələrin müstəqil fəaliyyəti arasında əlaqələrin dərinləşdirilməsi.

4) Şagirdlərin ədəbi inkişafının öyrənilməsi problemi və təkcə tədqiqat aspektində deyil, məktəbdə ədəbiyyatın tədrisinin əsası kimi məktəblilərin ədəbi təhsilinin müxtəlif mərhələlərində proqramların, konsepsiyaların, dərs texnologiyalarının seçilməsi.

5) Ədəbiyyatın öyrənilməsi, yenilərinin qurulması, ənənəvi olanlara əsaslanması üsul və üsullarının tarixi dəyişməsi. Yeni dərs strukturlarının axtarışı və dərslərin keçirilməsinin digər formalarının modelləşdirilməsi.

6) Müəllim və şagird arasında yeni tipli münasibətlərin formalaşdırılması, fərdin yaradıcılıq prinsiplərinin tərbiyəsi.

Ədəbiyyatın tədrisi metodları - elmi fikrin müəllimdən şagirdyə ötürülməsi yollarını öyrənməyə yönəlmiş bir fəndir, yönləndirmə ilə bağlı kifayət qədər geniş məsələlərə diqqət yetirir. bilik. Müəllim məktəbliləri bədii əsər dünyası ilə tanış etməli, sözlərə həssaslıq, oxu bacarıqlarını inkişaf etdirməli, onlara həyat hadisələrini müşahidə etməyi və şagirdin öz baxışı və baş verənlərin mahiyyətini dərk etməyi öyrətməlidir. Məktəbdə ədəbiyyatın öyrənilməsinin və deməli, tədrisinin başqa bir istiqaməti də şagirddə ədəbi dayaq və mənəvi inamın formalaşdırılmasıdır ki, onun sonradan həyatında prioritet kimi təyin edəcəyi məqsəd və vəzifələrə çatmaq lazımdır. Buna görə də ədəbiyyatın tədrisi fərdi inkişaf perspektivi ilə bağlıdır.

Ədəbiyyatın tədrisi metodları pedaqoji elmdir ki, onun mövzusu tələbələrə akademik bir fənn kimi ədəbiyyat haqqında maarifləndirmənin ictimai prosesidir və vəzifəsi onu daha düzgün istiqamətləndirmək üçün bu prosesin qanunauyğunluqlarını aşkar etməkdir.

Ədəbiyyatın bir elm kimi tədrisi metodikasının əsas məqsədləri aşağıdakılardır:

- məktəb ədəbiyyatı kursunun məqsədlərini, xüsusiyyətlərini, məzmununu və əhatə dairəsini müasir tələblərə uyğun müəyyən etmək;
- bədii əsərlərin məzmun və forma vəhdətində daha tez, hərtərəfli və dərindən mənimsənilməsinin ən səmərəli üsul və üsullarının öyrənilməsi və təsviri;
- məktəblilərin ədəbiyyatda müəyyən bilik, bacarıq və bacarıqları uğurla mənimsəmələri üçün şərait və yollar haqqında sualların hazırlanması
- müəllim və tələbə arasında yeni münasibət tipinin formalaşması, yaradıcı axtarışa və tələbənin müstəqil mühakiməsinə hazırlıq;
- ədəbiyyatın tədrisinin ədəbi, didaktik və psixoloji ilə məhdudlaşmayan qanunauyğunluqlarının aşkar edilməsi.

Müəllim bu və ya digər şagirddən nə ola biləcəyini, həyat şəraitində özünü necə göstərəcəyini dəqiq bilə bilməz. Məhz buna görə də ədəbiyyatın tədrisi bütün dövrlərdə insan həyatı təcrübəsində olan ən yaxşıları, xalqın, bütövlükdə xalqın zəngin həyat tarixini nəzərə almaqla qurulur. Bütün bunlar insan şagirdsini müstəqil həyata hazırlamaq üçün lazımdır. Bu bilik kompleksi zamanın bilavasitə tələblərindən yüksəkdə dayanır və biliyə yüksələn fərddən özünü dərk etməyi tələb edir. Böyüməkdə olan insan “mən”i bədii ədəbiyyat obrazlarında əks olunan həyat haqqında tarixi və mənəvi biliklərin ən yaxşı nümunələrinə arxalanmalıdır.

Ədəbiyyat musiqi və təsviri incəsənət kimi fənlərlə yanaşı, digər fənlərlə də əlaqəlidir. Eyni zamanda ədəbiyyat özünəməxsus bir mövzudur, çünki o, insan mahiyyətindən, həyatın mənasından obrazların dili ilə danışmaq qabiliyyətinə malik olan yeganə insandır. Ədəbiyyat bütün müxtəlifliyini ifadə edir və buna görə də mövzu haqqında bilik mənəvi yetkinliyi təmin edə bilər, təklif olunan həyat şəraitində ümumi və fərdi, fərdi və xarakterik olanı əlaqələndirməyə imkan verir. Bu, şagirddən özünü tanımağı tələb edir, onu seçim vəziyyətinə salır, həyatın müəyyən hadisələrinə münasibətini fəal şəkildə formalaşdırır. Başqa sözlə desək, şagird ədəbiyyatı öyrənməklə öz xalqının mədəniyyəti, bu və ya digər yazıçının dünyaya baxışları ilə dialoqa girir, dövrün xüsusiyyətlərini, ictimai şüurunu dərk edir və misilsiz məntiqi mülahizə təcrübəsi qazanır, məntiqi mülahizələrə yiyələnir. Əgər ədəbiyyatın öyrənilməsini yetkinliyə qədəm qoymağa hazırlıq mərhələsi hesab etsək, onda şagirdin bu və ya digər həyat hadisəsi haqqında mühakimələri tarix (zaman) biliklərinə, sosial həyatın əsaslarını, məişət həyatına dair biliklərə əsaslanmalıdır. Bədii əsəri dərk etmək üçün oxucuya onun bütün biliyi, bütün təcrübəsi lazımdır.

Ədəbiyyatın tədrisi metodikası bədii ədəbiyyatın tədris predmeti kimi pedaqoji elmi və müəllimin rəhbərliyi altında məktəblilərin onu mənimsəmə yollarıdır. Metodika ədəbiyyatın tədrisinin məqsəd və vəzifələrini müəyyən edir, öyrənilən fənnin məzmununu əsaslandırır, tədris prosesində müəllim və şagirdlərin fəaliyyətinin metod və üsullarını işləyib hazırlayır.

Milli məktəblərdə ədəbiyyatın tədrisi metodları əlaqəli elmlərlə sıx bağlıdır: doğma ədəbiyyatın tədrisi metodikası, ədəbiyyatşünaslıq, dilçilik, pedaqogika, psixologiya, estetika. Doğma ədəbiyyatın tədrisi metodikası ilə əlaqə bədii əsərin öyrənilməsinin əsas prinsiplərinin ümumiliyinin müəyyən edilməsi, ana dilində nəzəri və ədəbi anlayışların formalaşdırılması prosesinin əlaqələndirilməsi yolu ilə həyata keçirilir. Ədəbiyyat biliyi metodistə və müəllimə keçmiş və indiki ədəbi hadisə və faktlardan hansının vacib, hansının ikinci dərəcəli olduğunu, müəllifin yaradıcılığında hansı problemləri qoyduğunu və onları necə həll etdiyini mühakimə etmək üçün material verir. Tədris materialının həcmini, ardıcıllığını və təqdimetmə formasını əks etdirən proqramların, dərsliklərin və müəllimlər üçün dərs vəsaitlərinin müəllifləri ilk növbədə ədəbiyyat elminin nailiyyətlərinə əsaslanırlar.

Ədəbiyyatşünaslıq ədəbiyyatın mahiyyəti, onun həyatla əlaqəsi, ictimai-siyasi əhəmiyyəti, ayrı-ayrı yazıçıların yaradıcılığı, ayrı-ayrı əsərin ideya-bədii məzmunu haqqında problemlər hazırlayır. Ədəbi metodologiya başqa çətinliklərlə də üzləşir. O, pedaqoji elm olaraq məktəbdə ədəbiyyatın hansı məqsədlə öyrənilməli olduğunu, tədris fənni kimi ədəbiyyatın məzmununun nədən ibarət olmasını, ən yaxşı təhsil nəticəsini əldə etmək üçün müəllimin hansı üsul və üsullardan istifadə etməsini müəyyən edir.

Linqvistik elmi fənlərə əsaslanmaq şagirdlər üçün bədii əsərlərin ana dilinin mənimsənilməsi ilə bağlı metodoloji problemlərin həllini asanlaşdırır.

Milli məktəblərdə ədəbiyyatın tədrisi üsullarına iki linqvistik anlayışlar fərqləndirilir:

- şagirdlərin yazıçının dili və onun bədii funksiyası haqqında qavrayışı
- tədqiq olunan bədii əsərin linqvistik vasitələrinə yiyələnmək

Milli məktəbin Azərbaycan dili və ədəbiyyatı müəlliminin qarşısında duran ilk əsas sual, ilk növbədə, onun işinin məqsədləri məsələsidir. Onun fənninin tərbiyəvi əhəmiyyəti nədir? Azərbaycan ədəbiyyatı məktəbin qarşısında duran ümumi vəzifələrin həyata keçirilməsində hansı rol oynayır? Milli məktəblərdə şagirdlər arasında Azərbaycan nitqinin inkişafı prosesində Azərbaycan ədəbiyyatının rolu nədir? Məktəblilərin mənəvi-estetik tərbiyəsi necə həll olunur?Bu, onların həyata, ictimai faydalı və əmək fəaliyyətinə praktiki hazırlığına necə kömək edir?

Azərbaycan ədəbiyyatının ən mühüm xüsusiyyəti ondan ibarətdir ki, o, doğma ədəbiyyatla yanaşı, yeni formatlı, yeni mərhələli insanı nəinki mənəvi cəhətdən tərbiyə edir, həm də şagirdlərin nitqini zənginləşdirir və inkişaf etdirir. Azərbaycan ədəbiyyatının mənimsənilməsi və başa düşülməsi milli məktəbdə bəzi fərqli cəhətlərə malikdir. Nisbətən bu cəhətləri üç qrupa bölmək olar.

Birincisi, Azərbaycan ədəbiyyatı şagirdlər tərəfindən linqvistik şəkildə öyrənilir. Bədii əsərin obrazlarının bütün ideya-mənəvi və estetik dəyəri ilə qavranılması, başa düşülməsi və şagirdlərin şüurunda sabitləşməsi üçün mətn üzərində analoji əsərdən əhəmiyyətli dərəcədə fərqlənən xüsusi lüğət və frazeoloji iş lazımdır.

İkincisi, Azərbaycan ədəbiyyatının əsərlərində Azərbaycan xalqının maarifçiliyi, mədəniyyəti, adət-ənənələri, əxlaqı öz əksini tapır. Buna görə də, mətnlərin əlavə şərhlərə ehtiyacı var ki, bu da milli məktəblərin şagirdlərinə ədəbi əsərin Azərbaycan xalqının həyatı ilə əlaqələrini dərindən anlamağa kömək etməlidir.

Üçüncüsü, şagirdlərə ədəbiyyat dərslərində bu əlaqələrin və əlaqələrin açıqlanması şagirdlərin tədris prosesinə marağını oyatmaq və ədəbiyyatın tərbiyəvi dəyərini artırmaq üçün səmərəli vasitədir.

Azərbaycan ədəbiyyatının tədrisinin səmərəliliyinin artırılması Azərbaycan dili müəlliminin öz ana dili və ədəbiyyatı müəllimləri ilə sıx əməkdaşlıq şəraitində işləməsi zərurəti ilə ayrılmaz şəkildə bağlıdır. Qarşılıqlı əlaqə biliklərin inkişafı, bacarıqların möhkəmləndirilməsi üçün effektiv vasitədir və şagirdlərin təhsil və təliminde mühüm rol oynayır. Hər iki fənnin müəllimlərinin əlaqələndirilmiş fəaliyyəti məktəblilərin tədrisində, ideya-mənəvi, estetik inkişafında vahid

istiqamət yaradır, nəzəri və ədəbi anlayışlar sisteminin formalaşmasına töhfə verir, söz sənətinin bədii xüsusiyyətlərini dərk etməyi öyrədir. .

Milli məktəblərdə ədəbiyyatın tədrisi metodistlərinin təcrübəsi göstərir ki, Azərbaycan və doğma ədəbiyyat müəllimlərinin işində fəal qarşılıqlı əlaqə, öyrənilən proqram materialının bu məcmu təhlili əsərlərin daha dərindən qavranılmasına, şagirdlərin biliklərinin birləşməsinə kömək edir. Ədəbiyyat müəlliminin işində müəyyən bir forma, onun əsasını onların öyrənilməsi prosesində əldə edilmiş mövcud bilik, bacarıqlara əsaslanmaq, Azərbaycan ədəbi kontekstlərindən istifadə etmək, qəhrəmanların identifikasiyası təşkil edir.

Ədəbiyyatın qavranılması prosesi əsasən reallıq hadisələrini, doğma ədəbiyyatının bədii obrazlarını öyrənən şagirdlər vasitəsilə həyata keçirilir. Bədii-bədii mətn üzərində işləmək vərdişlərinə yiyələnmək, əsərlərin ideya məzmununu anlamaq, personajları qiymətləndirmək bacarığı mənimsənilir. Azərbaycan ədəbiyyatını mənimsəyərkən onu bilik, bacarıq, bilik və bacarıqlara əsaslandırmaq lazımdır. Azərbaycan ədəbiyyatının ülvi, yüksək ideya-bədii dəyəri onu gənc nəslin tərbiyəsində güclü vasitəyə çevirdi. Bu cür materialların dərslərə və sinifdənkənar fəaliyyətlərə cəlb edilməsi şagirdlərin ədəbiyyat dərslərinə marağını stimullaşdırmağa kömək edir, Şagirdlər bu və ya digər Azərbaycan yazıçısının çoxmillətli ədəbiyyatın inkişafındakı mütərəqqi əhəmiyyətini öyrənir, şagirdlərin doğma ədəbiyyatına dərin marağını səciyyələndirən materiallarla tanış olurlar ki, bu da həm yazıçının özünə dərin hörmət hissinin formalaşması üçün böyük əhəmiyyət kəsb edir. [4, s.29].

Ədəbiyyatın tədrisi metodikasından bir elm kimi danışarkən qeyd etmək lazımdır ki, dil müəllimlərinin qabaqcıl təcrübəsi bütövlükdə metodologiyanın inkişafı üçün çox vacibdir, çünki bu intizam əsasən təcrübəyə əsaslanır. Bu gün ədəbiyyatın tədrisi metodikası vahid təhsil paradiqmasının bərqərar olduğu dövrə qədəm qoyub və indiki mərhələdə ayrı-ayrı elmi məktəblərin alimləri tərəfindən aktual metodoloji problemlərin işlənib hazırlanması və həllində heç bir əsaslı fikir ayrılığı yoxdur. Dəyişən yanaşma bir elm və ədəbiyyat kimi tədris fənni kimi metodologiyanın dairəsini genişləndirir, ədəbiyyatın tədrisində vahidliyi, stereotipləri, qanunauyğunluqları aradan qaldırmağa imkan verir.

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Қазіргі қазақ әдебиеттану ғылымында жаңа терминдердің қалыптасуы

Қалмет Гүлсезім Ерболқызы
Әлкей Марғұлан атындағы Павлодар Педагогикалық университеті, «Қазақ тілі және қазақ әдебиеті» ББ 3-курс студенті
Ғылыми жетекші:
Матаева Асыл Камчыбековна
Әлкей Марғұлан атындағы Павлодар Педагогикалық университеті, «Қазақ тілі және қазақ әдебиеті» ББ оқытушы-сарапшысы

Аңдатпа
Берілген мақалада қазақ әдебиеттану ғылымы саласындағы жаңа терминдер қарастырылады. Қазіргі қазақ әдебиеттану қолданысындағы жаңа терминдердің мағыналары ашылады. Әдебиеттану саласындағы терминдер бойынша бірқатар ғалымдардың пікірлері сараланады.

Қазақ әдебиеттану ғылымының алғаш терминдер жинағын құрастырған қазақтың ұстазы Ахмет Байтұрсынұлының «Әдебиет танытқышы» зерттеуі шоқтығы биік еңбек болатыны сөзсіз. Әдебиеттанудағы бүкіл терминдерді Ахмет Байтұрсынұлы бір еңбекте жинақтап, өзге шет елдің терминдерін қазақшалап, жаңашылдық әкелген болатын. Бұл еңбектің ғылыми құндылығы қазіргі таңда да зор, салмақты еңбек болып табылады.

Әдебиеттану саласы - өте ауқымды, қаншама ғасырлар бойы келе жатқан, әлі де зерттеу үстіндегі ғылым. Әдебиеттану негізгі 4 бөлімнен тұрды:

1. Қазақ әдебиеттану ғылымы пайда болуындағы тарихи алғышарттар кезеңі
2. Қазақ әдебиеттану ғылымының туу кезеңі (1900 – 1940)
3. Қазақ әдебиеттану ғылымының қалыптасу кезеңі (1941 –1970)
4. Қазақ әдебиеттану ғылымының даму кезеңі (1970 жылдан бастап)

Әр саланың өзіне тән термині мен ерекшеліктері бар. Жаңа терминдердің қалыптасуы баяу жүретін үдеріс. Алайда қазақшаға аударылған және қолданыстан шығып жаңа мәнге енген терминдер жетерлік.

Жалпы термин дегеніміз - барлық салада болатын, өзіне тән кәсіби сөздер болып келеді. Термин сөздер заман талабына сай тілден алынып, қайта жаңарып немесе жаңа терминдер ене бастайды. Термин сөздер белгілі саланың өзіне тән кілт сөзі десек қателеспейміз. Дәл осылай уақыт өте әдебиеттану ғылымы саласында да жаңашылдықтар орын алады.

Қазіргі қазақ әдебиеттану ғылымында жаңа терминдердің қалыптасуы қалай жүріп жатыр? Еліміз Тәуелсіздік алғаннан кейін алғаш рет кеңестік әдебиет саласынан дараланып шығып, өз бағытын әлемдік деңгейде дамытуда, шетелдік тенденциялармен танысып, тәжірибе алмасу үздіксіз орны алуда. «Жаңа гуманитарлық білім. Қазақ тіліндегі 100 жаңа оқулық» жобасы нәтижесінде Джули Ривкин мен Майкл Райанның 4 томдық «Әдебиет теориясы» оқулығының аударма оқулығы қалың оқырманға ұсынылды. Осы еңбекке төңіренінде бірқатар пікірлер де айтылған болатын. Профессор Айгүл Ісімақова: «Әдебиет теориясының топтамасы қазақ оқырмандарына әлемдік әдебиет теориясының жаңа зерттеу бағыттарын ұсынады. Отандық әдебиет саласында қалыптасқан кейбір түсініктерді бұзып, мүлде жаңа тұрғыдан таныстырады» - деген пікір білдірсе, Ақтанова Айман Советқызының пікірінше: «Жалпы алғында аударылған теориялық еңбектердің пайдасы әрине бар. Бірақ

аудармада өз тілдік мүддемізді де ұмытпай, терминдердің төлтумалық қасиетін сақтаған жөн деп санаймын» деген болатын [1].

Әдебиеттану ғылымы заман талабына сай жаңа даму деңгейлеріне көтерілген сайын ондағы теориялық концепциялар да жаңарып, жаңа әдеби бағыттарды түсіндіру барысында жаңа терминдер қалыптасуда. Ендеше әдебиеттану ғылымы саласындағы бірқатар терминдерге тоқталып өтейік

Хронотоп – мекеншақ (Б.Майтанов)– уақыт пен кеңістік белгілерінің нақтылы бір үрдісінің табиғатына лайық бірлікте көрінуі. Мұнда уақыт қоюланып тығыздалады, сығылысады. Сөйтіп көркемдігімен көзге түсетіндей дәрежеге жетеді, ал кеңістік болса, шоғырланады, тарихтың, сюжеттің, уақыттың қозғалысына бағындырылады. Уақыт таңбасы кеңістікте белгіленіп көрінеді. Ал кеңістік уақыт арқылы танылып, өлшенеді. Көркем хронотоп қатпарлардың қиысып, белгілердің қосылып, тұтастануымен сипатталады (М.Бахтин). Мәселен, О. Бөкей шығармаларында уақыт пен кеңістік композициясы үлкен орын алады. Қаламгер оқиғалардың мезгілін нақты сипаттайды. Оның шығармаларындағы кеңістік пен уақыт ондағы оқиға, іс-әрекеттерге қатысты өзгеріп отырады.

Актант (actant)- нарратологиядағы көркем әдебиет кейіпкерлерінің жолдаушы/қабылдаушы немесе көмекші/қарсылас сияқты қарама-қарсы жұп рөлдерін білдіретін термин. Қазіргі кезде бұл терминді әлеуметтік ғылымдарда кез келген әрекет жасаушы нысанның атауы ретінде де кеңінен қолданылып жүр.

Аллюзия- әдеби шығармаға сілтеме жасау.

Симулякр (simulacrum)- көшірме деген мағынаны білдіретін грек сөзі. Жан Бодриар қазіргі мәдениет шынайлықты образбен алмастырған, сондықтан соғыстың қасіреті мен сұмдығы адамдардың жанын ауыртып, үрей туғызбайды дегенді алға тартты. Керсінше, бейнелердің шынайыланып кеткені сонша – бір соғысты бұқаралық ақпарат құралдарындағы бейне арқылы жете сол арқылы «әсіре шынайы» әлем түсінігін дамытамыз.

Архетип (archetype). Қазір жиі қолданылатын бұл термин мифология мен діннен таралған тозаққа түсу немесе өліп, қайта тірілу циклдері сияқты нарративті және тақырыптық тізбекті әрекеттерге қатысты.

Лиминалдық ұғымы (Rites de Passage) – өмірдің бір кезеңінен екінші кезеңіне өтуді білдіреді. Лиминалдық терминін алғаш рет антропология ғылымына Арнольд Ван Геннеп енгізген болатын.

Нарратология (narratology). Нарративті зерттеу Владимир Пропптың «Ертегі морфологиясынан» басталды. Пропп халық ертегілерінің сюжеттік құрылымын зерттей келіп, олардың баршасына «қаһарманның сапарға аттануы», «алғашқы ерлігін көрсетуі», «тосынсыйға ие болуы» т.б. сияқты сюжеттік элементтер ортақ болып келеді деген қорытындыға келді. Тыңдаушы немесе баяндаушы әңгімелеп отырған кейіпкер әрекеті арқылы нарративтің нақты элементтері айқындалады.

Интертекстуалдық (интермәтінділік). Интермәтінділік терминін әдебиеттануға 1967 жылы постструктурализм теоретигі Юлия Кристева енгізгені мәлім. Интермәтін туралы тұжырымдардың астарында дәстүр, даму мәселелері жатқаны белгілі. Әдеби жанрлардың ішінде адамның көңіл күйіне барынша терең бойлайтын поэзияда бағзыдан ауысқан мәтін үзінділері адам баласы пешенесіндегі белгілі бір жайттың, оқиғаның яки көңіл-күйдің ұқсастығының, үндестігінің нәтижесі екенін ескерген жөн. Сан ғасыр азаттық үшін алысқан қазақ халқының басынан кешкен тарихы мен тағдыры ұлттық поэзияда таңбаланып қалды десе де болады. Туған жер, ел тарихы, оның қасіретті кезеңдері ақындар шығармашылығынан маңызды орын алған.

Апория (aporia) - ойдың немесе әрекеттің шешімін таппаған дилеммасы. Мысалы екі жолдың бірін таңдау, қалай болғанда да, бір нәрсені жоғалту. Бұл біздің әдебиеттімізде

«Алпамыс батыр» жырында, «Ер Төстік» ертегілерінде кездеседі. Тығырыққа тірелу, шешу үшін бір нәрсені жоғалту.

Герменевтика(hermeneutics) - көне мәтін тілін қазіргі тілмен түсіндіру, қайта жүйелеуді білдіретін өзге бір атау.

Деконструкция (deconstruction) - XX ғасырда француз философы Жак Деррида ойлап тапқан сыншылдық әдіс.

Жаңа критицизм (new criticism) - әдеби мәтіндерді әсіресе өлеңдерді, олардың күрделі бейнелеу тәсілдерін,өлшемлерін т.с.с егжей-тегжейлі мұқият талдауға мүмкіндік беретін ұстаным.

Жаттану эффектісі (verfremdungseffekt) - шығарманың негізгі мақсатын сипаттау үшін ойлап тапқан термин.

Мимис (mimesis) - шынайы өмірді өнерде немесе әдебиетте имитациялау.

Терминдер үнемі өзгеру, жаңару үстінде. Терминдердің қолданысына қатысты келесідей ой түюге болады:

1. Өте көп қайталанатын балама сөздердің болуы;
2. Орынсыз қолданатын балама сөздер;
3. Бір терминнің бірнеше мағынада қолдануы (сирек);
4. Аударма ісіндегі кейбір терминдердің қажетсіз екендігі;
6. Әдебиеттану ғылымы саласында жаңа терминдердің пайда болуы өте сирек кездесетін құбылыс.

Жалпы терминдер екі түрлі принциппен жасалады. Бірінші жолы, барынша өз тілімізге бейімдеп, қазақша мәнін ашу. Екінші жолы мүлде баламасы болмаған жағдайда, орыс тілі немесе өзге тілдердегі термин сөздер қолданысқа енеді. Әдебиеттану ғылымындағы терминдердің жасалу жолы бірінші принциппен белсендірек жүріп жатқаны байқай аламыз. Зерттеу барысында әдебиеттану саласы бойынша жаңа шыққан терминдер жинағы сұранысқа ие екенін аңғардық.

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Historical Science

Қазақ қоғамының тарихында билер институтының рөлін оқытудың әдістемелік негіздері

Есіркегенов Бахтияр Айболатұлы
Шуршитбай Бейбитгул
Біржанова Мөлдір Бақытжанқызы

Аумалы-төкпелі, алмағайып замандарды бастан кешкен халқымыздың өзіндік басқару жүйесі де болған: ел қамын жеген ерлері, сөзін сөйлеп, жағдайын ойлаған шешендері, әділдіктің ақ туын түсірмеген білімпаз билері өткен. Билер халықтың көкейіндегісін айтқан, көмейіндегісін жарыққа шығарған әділет жоқшысы болған. Бұл тұлғаның ерекшелігі сонда, биді байлық та, барлық та жасай алмаған. Би тұғырына топты жарып, таразы басын тең ұстап, әділдікті сақтап, қара қылды қақ жарып айтатын парасатты адамдар көтерілген. Биге табиғи дарын, текті ақыл, алыстан көріп, барлай алатын, оны зерделей білген дана, сөздің «майын» ағызатын дүлдүл шешендер жатқан. Міне, осы би ұғымының мәнін ашатын: «Түгел сөздің түбі – бір, Түп атасы – Майқы би», деген сөз тарихта қалған [1]. «Билер институтының» құқықтық бастаулары ерте кезде пайда болғандықтан оны зерттеу үшін оның пайда болуын, қалыптасуын, дамуын белгілі бір кезекте кезең-кезеңге бөліп қарастыруды қажет етеді. Бұның өзі әр кезеңдегі, дәуірдегі билер институтының ерекшеліктерін анықтауға мүмкіндік береді. Тарихи институттарды, тұлғаларды зерттегенде оларды өмір сүрген нақтылы дәуірдің шеңберінде қарастыру әр зерттеушіге шарт болып табылады. Себебі, сол дәуірдегі саяси, құқықтық, экономи-калық, әлеуметтік қарым-қатынастардың ерекшелігін, деңгейін ескер-іп барып қана зерттеу нысанының ішкі табиғатын, құбылысын ойдағыдай ашып көрсетуге болады. Зерттеудегі осы бір ерекшелікті академик С. Зиманов былай айтады: Өткен дәуірде өмір сүрген қайраткерлердің көзқарастарын зерттеудің өзіне тән қиыншылықтары бар. Қиындық-қайраткер өмір сүрген және туындылар жасаған сол дәуір мен кезеңнің біртұтастық көрінісін азды-көпті болса да қалпына келтіру, өзіне қоғам дамуының бағытын және қажеттілігін ұғынуы, атап айтқанда, әлеуметтік қатынастар саласында, саясатта және идеологияда. Сомдап айтқанда, зерттеуші тарихқа кіруі қажет. Бұл оңай міндет емес. Бірақ, мұндай түсініксіз өткен құбылысты (құбылыстағы А.Н.) нақтылы-тарихи ыңғай туралы айту қиын-ақ. Кейде бізден алшақта қалған қоғамдық-саяси қайраткерлерге баға беруде сол кезеңнің тарихын және жағдайларын зерттемей, білмей ынта білдіретін фактілермен де кездесіп қаламыз. Осыдан мәселелерді ашуда субъективизм және догматика туындайды [2].

Міне, бұл баға жетпес құнды пікір қазақ қоғамындағы «билер институтын» зерттеуде басты қағида болып табылады

Жалпы билер институтының пайда болуы белгілі бір қоғамның қалыптасуымен, дамуымен байланысты. Қазақ рулары мен ұлыстары қалыптасқаннан бері, өз замандастарынан озған озат ойлы, шебер тілді адамдар болғаны күдік туғызбайды. Сондықтан да билер институтының пайда болуы мен қалыптасуы қоғамның белгілі бір даму сатысымен, шешендердің шығуымен, олардың сөздерімен байланысты.

Қазақтың атақты билері: Төле, қаз дауысты Қазбек, Әйтекеден қалған сөз билігі дәстүрі ғасырлар бойы үзілген емес. Олардың заманында, Ахмет Байтұрсынов пікірімен

айтқанда, «әділ билердің қолындағы билік қазақтың неше түрлі дертін жазатын таптырмас дәрі еді». Билер жақсы мен жаманды, жақын мен алысты, қымбат пен арзанды, қиын мен жеңілді салыстырып алға тартқан. Мал дауы мен жер дауына, ар дауы мен намыс дауына кесімді билік айтып, «тілмен түйіп, тіспен шеше алмас» тұжырым жасаған. Кез келген қазақ ол кезде мылжыңдықты, далбасалықты, жағымпазды мін көріп, қорлық санаған. «Сөз шынына тоқтайды, пышақ қынына тоқтайды» деп шындықтың туын көтерген «от ауызды, орақ тілді» шешендерін қастерлеп өткенҚазақ билері - сол заманда осы күнгі соттың да, тергеушінің да қызметін атқарған. Билер өздерінің бір ғана сөзімен небір шытырман даулы мәселелердің дұрыс шешімін тауып отырған. Қазақ шешендік өнерінің піспегі – шешен билер де, күбісі – халық. Ел есінде жүрген шешендік нұсқалардың туынгер – шешен-би. Халық заманы озған сайын билеріміздің шешендік сөз үлгілерін талқыға салып, қырлап, өңдеп, құлпыртып әкеліп, әлі күнге дейін айтады. Осындай әдеби-халықтық, фольклорлық сұрыптаулардан кейінгі біздің заманымызға келіп жеткен шешендік сөздер шымырқанған қымыздай жұтылған, таңдай татарлық дүниелер болып келеді [3].

Ал, «Би» сөзі мағыналық жағынан тұлға деген мағынада қолданылады. Қазіргі тілмен айтсақ, басшы, сот, саяси тұлға, демократиялық биліктің иесі.

Олардың бір ауыз сөзі халық үшін, ел үшін заң бола білген. Ел ішіндегі қақтығыстар мен мәселелерді өздерінің ұтымды ойы мен шешен сөздерімен шеше алып, әр іске әділ көзбен қарай алған. Билердің үлкен міндеті ол дауға қарсы шыға алып, әр мәселеге әділ қарау еді. Жүздер мен рулар арасындағы туындаған даулар мен келіспеушілікті алдын ала білген. Осылайша, қазақ билері ел ішіндегі әділеттілікті орната келе, қоғамда бейбітшілік орнатуға өздерінің үлкен үлесін қосты. Халық ішінде соты да, рухани ұстазы да, шешені де осы билер болған.

Қазақта би болудың екі жолы танылған. Соның бірі ата жолын қуу дәстүрі. Яғни, бұл жол бойынша атасы, әкесі би болған бала осы қасиетті бойына сіңіріп, әкесінен тәлім-тәрбие алып, оның ісін әрмен қарай жалғастырып отырған. Мысалға алсақ, XVIII ғасырда Орта жүздегі Қаракесек руынан шыққан белгілі Қазыбек бидің үшінші ұрпағына дейін осынау құрметті би атағы сақталған. Осыдан адамды «би» деп тануға, оның ата-бабасының «би» болғаны да үлкен септігін тигізгенін байқауға болады. Осыған байланысты белгілі заңгер ғалым Т.М. Культелеев: «…звание биев хотя и не было строго наследствен-ным, однако бийское пройсхождение имело весьма важное значение для его приобретения» [4],-деген сөздері жоғарыдағы пікірімізді нақтылай түседі. Сонымен қатар «би» деп тану үшін ата-бабасының «би» болуы міндетті де болмады. «Кей-кейде өте дарынды адамдар, халықтың әдет-ғұрпын білетіндігімен және асқан шешендігінің арқасында би атанатын». Яғни, ата-бабасы «би» болмаған адамдар да өздерінің табиғи қабілетінің арқасында, білімдар болып, қазақтың әдет-ғұрып құқығымен сот ісін жақсы меңгеріп, ел ішінде болып тұратын даулы мәселелерді шешуге араласып, бір емес бірнеше рет әділ билік айтып көзге түскендерге халық «би» деп қараған. Мұндай адамдар «би» деген атаққа ата-бабасы «би» болмаса да өз күштерімен, дарындылығымен жетіп отырған. Бұл жөнінде академик С. Зиманов: «…бывали отдельные случаи, когда выходцы из простого народа, в упорной борьбе преодолевая громадные трудности блогодаря своей природной одаренности добивались звания бия»,-деді [5].

«Әйтеке бауыздап, Қазыбек іреп, Төле мүшелеп берер» – деп халық қалт айтпай олардың әр шешімдерін жоғары бағалаған. Ел аузында айтылғандай, Әйтеке айтса «қандай қиқар даукесің де қалай құлақ аспасқа», Қазыбек айтқанда «төресі осы тығыла кетпеске» ләжы жоқ деп ел кесіп айтқандығы мәлім. Сондай –ақ халық тағы да «Әйтеке жорып жеткізіп айтады» деп үш биге байланысты бағасын беріп қойған.

Жас ұрпаққа қазақтың би – шешендерінің өмірінен мәлімет беріп қызықты тұстарынан сөз қозғау өнегелі істерге апарар жол.

Шешендік сөз – адамзат тарихындағы рухани материалдық мәдениеттің дамуының негізгі құралдарының бірі шешендікке құрылған әңгімелерді, аңыздарды және өлеңдерді бастауыш сыныпта оқыту бала тілін ұштайды, сөздік қорын байытады, өмірге деген көзқарасын оятып, дүниетанымына жол ашады.

Мектеп оқушыларына қазақ халқының атақты шешендері Қаз дауысты Қазыбек, Төле, Әйтеке билерді ана тілі пәні арқылы таныстырып, олардан қалған құнды да мол мұраларды оқыту, ұлағатты сөздерін айтқызу – уақыт талабы.

Үш бидің ел тыныштығы, оның бақытты келешегі, тәуелсіздігі үшін қауіп-қатерді елемей, бастарын бәйгеге тіккен осы шынайы отаншыл сезімі, ынтымақ- бірлігі басқалаларға да ықпал етіп, қазақ халқын бір мақсатқа жұмылдыра түскен. Бүгінгі бақытты өміріміз осындай бабалар арқасы екенін түсініп, үш биіміздей ұлыларды, елім деп еңіреген батырларымызды ұрпақ ешқашан ұмытпауы қажет деп білемін. Үш биге қойылған мүсін ұрпағының оларға деген құрметінің бір белгісі деп түсінемін.

Шешендік сөздерді тұңғыш зерттеушілердің бірі - М. Әуезов болса, 30-жылдары оларды іріктеп, жинап, халықтың керегіне жаратуға үлес қосып, қамқор болған, асыл сөздерді оқырман қауымға ұсынушы және балаларды ізгілікке тәрбиелеуде таптырмас құрал екенін оқытушы С. Сейфуллин болды. Сәкен Сейфуллин өзінің «Қазақ әдебиеті» [6] - дейтін кітабында шешен билердің әлеуметтік қызметтерін, шешендік сөздердің ауыз әдебиетінде алатын орнын анықтап, бірсыпыра нұсқауларын жариялады.

Билер мен шешендердің көрегендігін, даналық сөздерін оқытып, айтқызу жас ұрпақты шешендікке, ата-бабадан қалған мол мұраны игертуге баулиды.

Оқушыларға шешендік сөздерді туралы сөз қозғағанда ең алдымен мұғалімге назар аудару керек. Мұғалімдер күнделікті сабақ беру үрдісінде шешендік сөздерді орынды жерінде ойын дәлелдеуде дәнекер етсе, оқушыларды тілге шебер ойы орамды мәдениетті сөйлеуге тәрбиелейді.

Бір сөзбен айтқанда бұл зерттеудің жаңалығы – оқушылардың шешендік сөздерді меңгеру нәтижесінде сана-сезімі мен ақыл ой ұшқырлығы, сөз шеберлігі, дұрыс ойлау жүйесін, шығармашылық қабілетін арттыруға болады.

Қазақтың қанымен біткен, жаратылысындағы бітім болмысына сай келетін даусыз бір өнері – шешендік. Ұшқан құстың қанаты талар қазақтың ұланғайыр сайын даласында туып-өскен сахара перзентін жаратқанның өзі шешендікті қанымен бірге бойына дарытатын секілді. Айдалада қозы соңында жүріп, қиялына ерік беретін жұдырықтай баласына дейін таңдайы тақылдап, суырылып сөйлей жөнелген. Табиғатпен сырласа жүріп, қиялын ұштап, тілін жетілдірген. Қазақ баласының қиялына ұшы қиырсыз даласы да, ұшқан құста, желмен тербелген көкмайсасы, боз жусаны да, өзен-көлі де, тау-тасы да серік. Табиғатпен бірге өсіп, біте қайнасқан, құнарын сезініп, бойына сіңірген, рухани ләззат ала білетін, жаны сүйіп, сырласа білетін қазақ баласының қиялы жүйрік, тілге шешен келуі заңдылық сияқты. Халықтың әлдекім туралы айта қалғанда «табиғатынан өнерлі», «табиғатынан шешен», «Алла оның табиғатына берген» дейтіні содан болса керек. Яғни, табиғатты – жаратылыс деп қабылдайтын болсақ, мұның мағынасы да айқын болып шыға келеді, табиғаттың жаратылысындай, қазаққа да жаратқан иеміз шешендікті жаратылысына дарытса керек. Заман өте келе, ол қасиет азайып, дәуір ызғары әсер еткен. Екі ғасырдан астам өзге империяның қол астында болған отаршылдық дәуірде өзгелердің үстемдігі жүрді, дегені болды, ешкімге бағынбаған, құлдық ұрмаған асау жұрттың ұрпағы едік, сағымыз сынды, еріксіз жат жұрттың тарихына мойынсұндық, өз өткенімізді ұмытайық деген жоқпыз-ау, ұмыттырды, қасиетті тарихымыз бен салт-дәстүрлеріміз, ата-бабаларымыздың асыл ұлағаты аяқасты болды, арындаған айбарлы жұрттың ұрпағы едік, кеудеміздің басылғаны рас. Өзге жұрттардың өркениетін ең алдымен таныдық, тарихы мен ғылымын оқып өстік, тіпті, сонымен көзімізды ашып, санамызға сіңірдік [7].

Отыз жылдан астам уақытта тәуелсіздік шапағаты тиіп, баяу болса да тарихымыздың ақиқатына жақындап келеміз, уақыт өткен сайын бұрын танылмаған шындықтардың беті ашылуда, көмескі кезеңдеріміз айқындала түсуде.

Қазақ баласы өзінде жоқ өнерге ешқашан таласып көрмеген. Ал өнер атаулының үздігі, биік шыңы деуге тұрарлық – шешендік өнеріне таласымыз бар. Жасыратыны жоқ, екі ғасырлық отаршылдық дәуірімізде еуропалық оқу-білім үстемдік құрып келіп, тіпті, ес біліп, етек жаппаған ескі заманнан табиғатымызбен қалыптасқан өнерлерді жат жұрттардың қанжығасына байлап жүріппіз. Ал қазақ – қазақ аталмай тұрып санау көне замандардағы, ата-бабаларымыздың – сақтар мен ғұндардың дәуірінен бергі талассыз үлкен өнері – шешендігі емес пе еді. Байыбына барып қарасақ, еуропалықтардың өздері осы ақиқаттың бетін ашып, Орхон-Енисей аңғарларынан табылған ата-бабаларымыздың мұраларындағы Күлтегін, Білге қағандардың қаһармандығымен қоса, шешендігіне, төгілген ақындығына таң қалып, тамсанумен келе жатыр.

Ал енді сол ежелгі бабалар дәстүрі, өнері қазақ баласында жақсы сақталды, тіпті, қазақ даласы сол құдіретті өнердің сақтаушы қазыналы құт сандығына айналғандығы басып өткен бел-белестерімізде айшықты таңбаланған.

Қорыта келе айтарымыз, біз билер институтын зерттеуде, осыған дейін жеткен жетістіктерге сүйене келе белгілі емес кейбір жақтарын ашып көрсетуге тырыстық. Дегенменде, билер институтының құқықтық мұрасының әлі де болса да зерттейтін жұмбақ жақтары көп. Өйткені бір зерттеу еңбегінің аясында билер институтын тұтастай қамтып шығу мүмкін емес. Бұл құқықтық құрылымның мұрасын зерттеу үшін әлі де болса аянбай еңбек ету керек. Себебі, билер институтының мұрасы бұл сайын даланың перзентерінің сан жылдар бойы қалыптастырған ұлттық мәдениеттің, болмысының көрінісі болып табылады.

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ПРОБИОТИКИ ДЛЯ ЖИВОТНЫХ: ОСНОВНЫЕ АСПЕКТЫ И ПРЕИМУЩЕСТВА

Ерназарова Сандугаш Тукеновна
к.в.н., старший преподаватель КазНАИУ
Мыктыбаева Р.Ж.
к.в.н., профессор КазНАИУ
Кожахметова З.А
к.б.н., ассоциированный профессор КазНАИУ
Джанабекова Гульмира Кумискалиевна
д-р б.н., профессор КазНАИУ
Жылкышыбаева Меруерт Маликовна
к.б.н., ассоциированный профессор КазНАИУ

В настоящее время в Республике Казахстан наблюдается интенсивное развитие отечественного животноводства, следовательно, эффективность успешного развития этой сферы требует постановки многих задач. Таких как получение максимальной продуктивности и высокой сохранности поголовья, производство высококачественных и безопасных для питания человека продуктов, снижение себестоимости продукции животноводства и обеспечение экологической безопасности.

Однако, как известно, высокопродуктивные животные и птицы более чувствительны к стрессам, а низкая иммунокомпетентность часто приводит к вспышкам инфекционных заболеваний, что вынуждает производителей применять антибактериальные веществах [1]. Также их применяют в качестве эффективных кормовых добавок, стимулирующих рост и развитие молодняка, а также и в целях повышения сохранности и продуктивности животных и птиц, несомненно, улучшается экономическая сторона и высокая конкурентная способность производства мяса, молока, яиц и другой животноводческой продукции, хозяйства получают быструю и немалую прибыль.

Но вместе с этим, при широком применении антибиотиков в качестве лечебных препаратов происходит быстрое накопление резистентных к этим соединениям форм микроорганизмов.

Участились случаи дисбактериозов среди молодняка нередко приводящие к их гибели, причинами которого являются изменения микробиоценоза кишечника и соответственно снижение иммунитета организма в целом. Антибиотики, применяемые для терапевтических целей и для стимуляции роста и развития молодняка животных, в больших количествах накапливаются в продуктах питания – мясе, молоке и яйцах. Что в свою очередь создает угрозу для здоровья человека, вызывая дисбиозы, аллергии, снижая иммунитет[2].

В связи с этим появилась острая необходимость решения проблем производства экологически чистой и безопасной продукции.

На сегодняшний день альтернативой антибиотикам для стабилизации микрофлоры ЖКТ в рацион скота и птицы с первых дней жизни вводят препараты на основе пробиотиков[3] .

Пробиотики - живые бактерии, микроорганизмы, которые обитают в организме человека и животного, и положительно влияют на его жизнедеятельность. Попадая в организм, они начинают вырабатывать ферменты, аминокислоты, антибиотические вещества. Эти биологически активные вещества снижают воздействие патогенов, стимулируют развитие специфического и неспецифического иммунитета. Пробиотические препараты – это один из многозначимых товаров, как на мировом рынке, так и на отечественном рынке. Объем продаж пробиотических препаратов оценивается в миллиарды долларов в год. На практике пробиотические препараты применяют: в скотоводстве: при выращивании телят, поросят, лечении коров и свиноматок, в птицеводстве, при разведении кур, гусей, перепелов, уток, в прудовом рыбоводстве. Для повышения перевариваемости и усвояемости кормов, стимуляции роста и развития животных, повышения неспецифического иммунитета используются как пробиотические, ферментные, пребиотические и комбинированные ферментно-пробиотические препараты, так и комплексные пробиотические препараты, обогащенные фитокомпонентами. Пробиотические препараты широко применяются в растениеводстве, садоводстве для расширения арсенала экологически безопасных средств, в качестве ростостимулирующих, анти-стрессовых препаратов и для комплексного управления ростом и развитием растений при производстве посадочного материала земляники, для биологического контроля септориоза черной смородины в условиях западной Сибири, для подавления развития пурпуровой пятнистости и серой гнили малины, для снижения распространения заболевания корнеедом проростков сахарной свеклы, против возбудителей корневой гнили зерновых культур для защиты урожая от вредных организмов, для обработки семян злаковых растений пшеницы кукурузы с целью увеличения урожайности, улучшения показателей структуры урожая, повышения устойчивости растений[4] . Пробиотики также используются для обработки твердого или жидкого навоза. Пробиотические препараты являются хорошими средствами для переработки биодеградируемых отходов пищевой, мясной, молочной промышленности,
сточных вод, городских свалок, активного ила и т.д. Так для очистки почвы от нефтяных загрязнений в почву вносят помет птиц после применения птицами пробиотических препаратов, что позволяет снизить концентрацию нефти в почве в течение 3 месяцев летнего периода.

Животноводы используют кормовые добавки с пробиотическими препаратами с разными целями: укрепление иммунитета, профилактика, лечение желудочно-кишечных заболеваний, расстройств пищеварения, восстановление микрофлоры ЖКТ после лечения антибактериальными препаратами, стимуляция роста, увеличение привеса, снижение риска возникновения инфекционных заболеваний, улучшение перевариваемости пищи, ускорение адаптации к сложным насыщенным рационам, преодоление последствий технологических стрессов[5]. Ветеринарные пробиотики повышают продуктивность на 15-20%, снижают продолжительность желудочно-кишечных заболеваний на 30-40%, сокращают заболеваемость молодняка на 20-30%.

Регулярное применение пробиотиков в кормлении птицы, крупного рогатого скота, свиней способствует активизации всех физиологических процессов[6]. В результате повышается сохранность поголовья, качество мясной, молочной продукции, ускоряется прирост живой массы молодняка.

Известно, что в состав пробиотиков входят представители нормальной микрофлоры кишечника, безопасные для здоровья животных и обладающие широким спектром полезных свойств, в частности, бифидо-, молочнокислые,
лактобактерии, а также стрептококки и аэробные спорообразующие бактерии.

Давно известна антагонистическая активность бифидобактерий к гнилостным и патогенным микроорганизмам, что характеризует их высокой адгезивностью на энтероцитах кишечника, продукцией бактерицидных веществ и иммуномодуляторов. Кроме того, эти микроорганизмы обеспечивают на 40% потребность организма в незаменимых аминокислотах: лизина, аргинина, глютаминовой кислоты, валина, лейцина. Бифидобактерии эффективно борются с сальмонеллами, золотистым стафилококком, патогенными кишечными палочками[7]. Они синтезируют аминокислоты, стимулируют выработку интерферона.

Вторым важным представителем нормальной микрофлоры кишечника являются лактобактерии различных видов. Их антагонистическая активность связана с высокой адгезивностью и выработкой интерферонов, иммуномодуляторов и бактерицидных соединений (лактацины, лактабиотики и др.). Лактобактерии (около 50 видов). Обеспечивают целостность слизистой оболочки кишечника, ее барьерные свойства. Поддерживают здоровый кислотно-щелочной баланс, создают благоприятные условия для нормального функционирования пищевых ферментов. Антибактериальное действие лактофлоры обусловлено выработкой бактериоцинов. Это низкомолекулярные белки, способные закрепляться на специфических клеточных рецепторах бактерий и подавлять их активность. Они обладают высокой антагонистической активностью и заселяют кишечник новорожденных животных, создавая биологический барьер для патогенных микроорганизмов, стимулируя быстрый рост собственной микрофлоры организма, устойчивы к антибиотикам, не токсичны, не аллергенны[8].

Наряду с этим существуют определенные требования к продукции содержащим пробиотические вещества. Микроорганизмы могут быть включены в группу пробиотических препаратов, если соответствуют
следующим критериям: выживать при пассировании через желудочный тракт, что предполагает их резистентность к кислоте и желчи, адгезироваться на эпителиальных клетках кишечника с последующей колонизацией, стабилизировать кишечную микрофлору, быть не патогенными, сохранять жизнеспособность, как в пищевых продуктах, так и в процессе получения фармакопейных лиофилизированных препаратов, быстро размножаться, колонизируя кишечный тракт, персистировать с проявлением родовых свойств пробиотических препаратов, быть абсолютно безвредным для людей, животных и окружающей среды, быть стабильным в отношении продуктивности и требований, определенных технологическими условиями культивирования, хорошо расти при использовании сравнительно дешевых и доступных питательных сред, таких как солянокислотные или панкреатические гидролизаты сои, казеина, рыбокостной муки и т.п., быть фагоустойчивыми, обладать устойчивостью к воздействию неблагоприятных факторов длительного хранения не менее одного года[9].

В Казахстане разработкой пробиотических препаратов занимаются такие профессора как Тулемисова Ж.К., Касенова Г.Т., Мыктыбаева Р.Ж., Кожахметова З.А. Ими разработаны пробиотики такие как «Торулакт», «Лактобактерин» и др. Все полученные препараты апробированны и успешно применяются как в птицеводстве, так и в животноводческих хозяйствах. Как известно основное действие данных препаратов направленно не только на профилактику кишечных инфекций и заселения желудочно-кишечного тракта полезной микрофлорой, а также доказано их положительное влияние на прирост у молодняка крупного рогатого скота, и показало отличный результат при выращивании цыплят первых

дней жизни. По результатам эксперимента применения препарата «Лактобактерин-ТК2» с профилактической целью в I -ой опытной группе среднесуточный прирост телят за 10 дней составил 6,79 кг, во II-контрольной группе составил 5,0 кг. Таким образом, в I-ой опытной группе среднесуточный прирост живой массы был на 1790 граммов больше, чем у контрольной. По результатам эксперимента применения препарата «Лактобактерин-ТК2» с лечебной целью в III-ей опытной группе среднесуточный прирост телят в среднем за 10 дней составил 4,43 кг, в IV - контрольной 4,02 кг. Соответственно в III-ей опытной группе среднесуточный прирост живой массы был на 410 граммов больше, чем у контрольной [10].

Таким образом применение пробиотиков в ветеринарии дает возможность:

Повысить экономическую эффективность работы животноводческих предприятий;

Заметно улучшить эпизоотическую и экологическую обстановку в районах производства животноводческой продукции;

Получить высококачественную продукцию, свободную от сальмонеллеза, антибиотиков, химиотерапевтических препаратов, следов дезинфектантов, для системы здорового питания населения.

Необходимость решения проблем производства экологически чистой, безопасной и вкусной продукции повышенного спроса для населения, открывает большую перспективу в использовании пробиотиков в животноводстве[11].

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481 Grove Road

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