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Performance Evaluation of Polymer-Modified Asphalt

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Annotated bibliography

Yan, K., You, L., & Wang, D. (2019). High-Temperature Performance of Polymer-Modified Asphalt Mixes: Preliminary Evaluation of the Usefulness of Standard Technical Index in Polymer-Modified Asphalt. *Polymers*, *11*(9), 1404. https://doi.org/10.3390/polym11091404

The article demonstrates investigations of polymer-modified asphalt mixes' performance in high-temperature conditions, focusing on evaluation of technical indices' standards. The authors present a preliminary and primary analysis showing that even if these indices can provide useful benchmarks, there is an importance of further refinements to improve the performance characteristics of polymer-modified mixtures.

Yan, Y., Cocconcelli, C., Roque, R., Nash, T., Zou, J., Hernando, D., & Lopp, G. (2015). Performance evaluation of alternative polymer-modified asphalt binders. *Road Materials and Pavement Design*, *16*(sup1), 389–403. https://doi.org/10.1080/14680629.2015.1030830

Several alternative polymer-modified asphalt binders are evaluated in this study, analyzing their performance under different conditions. The results indicate that improved resistance to such issues as deformation and cracking can be offered by alternative binders; it also leads to enhancement of asphalt pavement durability.

Chen, J. S., Liao, M. C., & Tsai, H. H. (2002). Evaluation and optimization of the engineering properties of polymer-modified asphalt. *Practical Failure Analysis*, *2*(3), 75–83. https://doi.org/10.1007/bf02719194

This paper is dedicated to evaluating and optimizing the engineering characteristics of polymer-modified asphalt (PMA). The authors present an overview of the influence of proper selections and modifications of components on asphalt performance enhancement, which leads to higher strength and durability of road surfaces.

Yu, J., Chen, Y., Wei, X., Dong, N., & Yu, H. (2022). Performance Evaluation of Ultra-Thin Wearing Course with Different Polymer Modified Asphalt Binders. *Polymers*, *14*(16), 3235. https://doi.org/10.3390/polym14163235

This paper evaluates the performance of ultrathin pavements created using different polymer-modified asphalt binders. The findings highlight that for optimization of durability and wear resistance the process of binders selection is critically important, as results show considerable differences in performance characteristics.

Ahmed, A. W., Said, S. F., Lu, X., & Carlsson, H. (2018). Pavement performance follow-up and evaluation of polymer-modified test sections. *International Journal of Pavement Engineering*, *20*(12), 1474–1487. https://doi.org/10.1080/10298436.2018.1435878

This study focuses on the research of the polymer-modified asphalt performance under different tests and conditions. The authors also provide an assessment of performance in field circumstances, showing that critical improvements of pavement performance can be reached by polymer modifications.

Alsolieman, H. A., Babalghaith, A. M., Memon, Z. A., Al-Suhaibani, A. S., & Milad, A. (2021). Evaluation and Comparison of Mechanical Properties of Polymer-Modified Asphalt Mixtures. *Polymers*, *13*(14), 2282. https://doi.org/10.3390/polym13142282

The authors in this research assess and review the mechanical properties of different polymer-modified asphalt mixtures. The obtained findings demonstrate that performance properties are affected by variations and proportions of used polymers, suggesting the selection of materials should consider further application.

Lu, X., Said, S., Carlsson, H., Soenen, H., Heyrman, S., & Redelius, P. (2014). Performance evaluation of polymer modified bitumens on a heavily trafficked test road. *International Journal of Pavement Research and Technology*, *7*(6), 381–388. https://doi.org/10.6135/ijprt.org.tw/2014.7(6).381

The performance of polymer-modified bitumens on a test road with high traffic volume is assessed in this article. The performance measures recorded by the authors show how polymer modification might enhance resistance to cracking and rutting under high traffic situations.

Viscione, N., Lo Presti, D., Veropalumbo, R., Oreto, C., Biancardo, S. A., & Russo, F. (2021). Performance-based characterization of recycled polymer modified asphalt mixture. *Construction and Building Materials*, *310*, 125243. https://doi.org/10.1016/j.conbuildmat.2021.125243

This article describes the durability and mechanical characteristics of an asphalt mixture that was enhanced using recycled polymers. According to the results, reuse of polymer ingredients can result in improving asphalt production's sustainability while meeting performance requirements.

Zhou, Z., Gu, X., Jiang, J., Ni, F., & Jiang, Y. (2019). Fatigue cracking performance evaluation of laboratory-produced polymer modified asphalt mixture containing reclaimed asphalt pavement material. *Construction and Building Materials*, *216*, 379–389. https://doi.org/10.1016/j.conbuildmat.2019.05.031

In this study mechanical properties and performance of PMA mixtures that were produced in lab conditions are assessed and reviewed. Research findings show the fatigue resistance of recycled and reused mixtures can be improved by polymer modifications.

Introduction

Enhanced properties and better performance of polymer-modified asphalt in comparison to regular one made it a promising and attractive option in the field of pavement engineering. Since polymer additives result in increased resistance to such issues as rutting, cracking, and fatigue, thereby improvement of physical and mechanical characteristics make Polymer-modified asphalt a reliable solution for extreme weather conditions and high-traffic. Moreover, better performance results in not only increased durability but also safety of roadways, especially in districts that are prone to high loadings and large temperature fluctuations.

In order to optimize PMA additives researchers had to investigate a variety of polymers and binders, as well as different types of methodologies to make assessments and comparisons of their performance because the selection of an appropriate evaluation technique that can comprehensively describe polymers' behavior remains a challenge. The main goal of this study is conducting a comprehensive analysis and comparison of approaches that were used in earlier studies to evaluate PMA's performance. Also, to assess strong and weak sides of current methodologies, suggesting optimized evaluation and application of polymer mixed asphalt in pavement construction. The usage of sustainable materials - like recycled polymers and recovered asphalt - will also be covered in this research paper. As the road construction industry shifts to more ecologically friendly options, these materials are widespread lately .

Literature review

The performance characteristics and durability of asphalt have been considerably improved because of recent developments in PMA. The performance under high temperature conditions was assessed by Yan et al. (2019), suggesting that there is a need for refinement of existing technical indices to reflect the unique features of polymer mixed asphalt. Before this study Yan et al. (2015) discovered that resistance to such problems as deformation and cracking can be solved using polymer binders, suggesting that optimization of pavement performance is affected by choice of polymers. Later similar results demonstrated Yu et al. (2022), highlighting the significance of polymer-modified binders' selection for the ultra-thin wearing courses and dependence on specific engineering demand. According to Chen et al. (2002) improvement of durability and performance because of asphalt modification resulted in establishment of PMA as a favored choice in road engineering.

The field studies that were done by Ahmed et al. (2018) verified the reliability and validity of polymer modified asphalt over time, highlighting such long-term benefits as resistance to cracking and pavement deformation. Next year, Zhou et al. (2019) demonstrated that PMA that contains recycled materials can perform the same as PMA in terms of mechanical properties, supporting the potential of polymer mixed asphalt as a sustainable pavement solution. The same findings were obtained by Viscione et al. (2021), showing that reused materials do not affect mechanical properties.

Methodology

To examine and compare various methods of assessment that were used in previous studies for evaluation of performance of polymer-modified asphalt this research work uses an analytical approach. Therefore, systematic review of information about technical indexes, specific tests and performance conditions is included in the methodology. High-temperature stability, fatigue resistance, cracking, deformation, and the results of using recycled materials are the significant performance factors that were taken into account.

1. Analysis of Technical Indices and Testing Protocols:
   In the researches of Yan et al. (2019) and Yu et al. (2022) the authors focused on performance of PMA under high-temperature conditions using superpave specifications in terms of standard technical indexes. In order to identify the effectiveness in real world conditions those indexes were analyzed. Meanwhile, mechanical testing approaches were done by Chen et al. (2002) and Ahmed et al. (2018), for instance, DSR - dynamic shear rheometer and four-point bending tests to assess mechanical properties and fatigue resistance.
2. Field Performance Comparison:
   Lu et al. (2014) and Ahmed et al. (2018) to verify theoretical and laboratory results performed field tests on high trafficked highways. These field assessments provided insights of long-term performance, which were contrasted with results from laboratories.
3. Sustainability Considerations:
   Researches that were conducted in 2019 by Zhou et al. and Viscione et al. included recycled materials in PMA mixtures. To find out how recycled content affects PMA qualities and characteristics and whether these techniques are appropriate for common usage, their methodologies were reviewed.

The main purpose of this analysis is to determine methods of assessments and comparison that are appropriate and reliable for PMA. Moreover, this analytical method can help to provide recommendations and suggestions about approaches that can be adapted for further research and applications.

Discussion

Evaluation of research and engineering problems related to polymer-modified asphalt shows effective and appropriate methods for assessing the performance of polymers in asphalt mixture. Using the prediction models that were proposed by Yan et al. (2019), which are standard technical indices, it can be seen that these indices serve as preliminary benchmarks and in most cases do not provide a true representation of PMA behavior under high temperatures conditions. These findings indicate that some of the existing specifications and characteristics should either be revised or expanded with additional performance criteria so predictions of pavement performance in the field might be provided as realistic values. On the other hand, research works done by Chen et al. (2002) and Alsolieman et al. (2021) were based on mechanical testing approaches that offered an enhanced explanation of how mechanical indices of asphalt can depend on various types of polymers. The application of DSR and different procedures for fatigue testing enabled authors to show what should be designated as an increase in elasticity and as progression with regards to constant deformation of the material. However, because of high time consumption and requirements of specialized equipment the effectiveness of evaluations can be limited. Conducted observations of PMA performance in the field by Ahmed et al. (2018) or Lu et al. (2014) were consistent with the results of laboratory studies with respect to resistance to rutting and cracking as a result of polymer modification. According to Viscione et al (2021) and Zhou et al (2019), sustainability has been the central concern of these studies analyzing the use of recycled polymers and asphalt in PMA mixtures. Research works have demonstrated that improvement of mechanical properties as well as reduction of the environmental effect of the product might be provided by reclaimed raw materials. However, there are potential challenges with quality control and pavement durability over time. The optimization of PMA technology can be done using appropriate proportioning and mixing of materials along with performance testings, adoption of such procedures will assure that a minimum acceptable level of performance is met.

Overall, no single approach that evaluated performance of polymer modified asphalt can offer conclusive and definite results. Laboratory tests, technical indices, and field evaluations are sufficient for specific applications. Therefore, methodologies should be oriented to the specific purpose of the project or study objectives and end-use applications with emphasis on polymer and binder selection, emphasizing polymer and selection of binder.

Conclusion

In conclusion, many parameters must be used to evaluate polymer-modified asphalt (PMA), including laboratory testing, field performance evaluation, and sustainability evaluation. Proprietary technical performance can be useful, but the behavior of PMA under all conditions can be much more complex than these technical standards provide. So additional extended testing is required. Although it is necessary to understand the behavior of different polymers in PMA, such mechanical tests as dynamic shear rheometer and fatigue resistance must be supported by subsequent long-term performance testing to evaluate characteristics of polymer-modified asphalt pavements under real-world conditions. This research work also highlights other relevant issues such as the need to recycle and use more eco-friendly polymer-modified asphalt. In the production process of PMA, reclaimed polymers and reused asphalt are replaced with virgin polymers, which does not affect the performance of PMA and enhances its environmental sustainability. International cooperation is required to reach homogeneity of polymers and model their durability. To summarize, the study came to a conclusion that its primary contribution is recommendations for future research themes to develop more stringent performance requirements and improve PMA performance evaluation approaches. To maximize the use of PMA in road construction and create more durable, economically efficient and environmentally friendly

pavements, the industry should adopt a holistic strategy that incorporates various testing methods and takes environmental safety into account.

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An analysis of types of automobile turbocharger in the present, past and future, as well as their impact on the engine system

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Abstract

This article analyzes the development and future trends of turbocharging technology in the automotive industry, highlighting its impact on engine efficiency and emission control. Originally used to increase power in aviation and motorsports, turbochargers have evolved into critical tools for improving fuel efficiency and reducing carbon dioxide emissions in modern automobiles. Key innovations such as variable geometry turbines (VGTs) and electric turbochargers (E-Turbos) are discussed in the context of meeting stringent environmental regulations such as Euro-6 and Euro-7. The article also discusses the increasing role of turbocharging in hybrid and hydrogen engines, emphasizing its ability to provide a downsizing of internal combustion engines without compromising performance. Challenges related to material durability, cooling and intelligent control systems are discussed, as well as the continuing need for technological advances. Summarizing, the article concludes that continuous innovation in turbocharging is necessary to achieve future performance and environmental goals in the automotive sector.

Introduction

Recently, the President of Kazakhstan has paid special attention to the need to modernize the transport system and actively switch to environmentally friendly technologies. His speech emphasized that the problems of air pollution and the use of outdated automobile technologies require prompt solutions. This was especially true for internal combustion engines, which had a significant negative impact on the environment by increasing carbon dioxide emissions. To cope with these challenges, it is proposed to accelerate the introduction of environmentally friendly technologies that will reduce harmful emissions and improve the country's environmental situation.

One of the key solutions is the use of turbochargers. These devices improve the efficiency of engines, reducing fuel consumption and lowering emissions. Turbochargers have evolved significantly over time, from their initial use in racing and heavy-duty vehicles to mainstream use in conventional automobiles. While progress has been made in their design, challenges remain, such as improving durability, efficiency and economic viability. This article focuses on the evolution of turbochargers, their impact on automotive engines, and future prospects given the tightening environmental and technological standards.

History and development of turbochargers

Turbochargers first appeared in the early 20th century and were originally developed for aircraft engines during the First World War. Their main purpose was to increase engine power by pumping more air into the cylinders, allowing more fuel to be burned and thus generating more power. Over time, this technology found its way into the automotive industry as well, initially in race cars of the 1950s and later in heavy machinery.

By the late 1970s and 1980s, turbochargers began to be used in consumer cars as well, driven by the oil crisis and the increasing demand for fuel-efficient vehicles. The first turbocharged engines, although characterized by high power output, had a number of problems such as delayed power delivery (called “turbo lag”) and lack of reliability due to difficult operating conditions.

Modern turbochargers have overcome many of these early problems. Innovations such as variable geometry turbines (VGTs) allow for more precise control of air delivery, reducing lag and improving engine responsiveness. These improvements have made turbochargers a standard element in most vehicle types, delivering high performance and efficiency.

Impact on engine efficiency and emissions

Turbochargers significantly improve engine efficiency. By increasing the air supply to the engine, turbochargers allow more fuel to be burned, resulting in more power with less engine displacement. This has enabled automakers to create smaller engines that are just as powerful, but use less fuel and emit less carbon dioxide.

With today's global environmental standards, such as Euro-6 and the upcoming Euro-7, turbochargers play a key role. These stringent regulations require the reduction of not only carbon dioxide emissions, but also other harmful substances such as oxides of nitrogen (NOx) and particulate matter. Turbocharged engines, especially when combined with advanced exhaust aftertreatment systems, offer a practical solution to meet these environmental requirements, making turbocharging an indispensable technology in today's automotive industry.

Future prospects and challenges

As the automotive industry transitions to hybrid and electric vehicles, the role of turbochargers will inevitably change. In hybrid systems, turbochargers can be used in conjunction with electric motors to increase power while reducing engine size and weight. This in turn improves fuel efficiency and reduces emissions, which is critical to achieving long-term environmental goals.

Nevertheless, certain challenges remain in turbocharger development. High temperatures and pressures can lead to material wear and failure. Research into the use of heat-resistant materials such as ceramic alloys shows promising results in addressing these challenges. These materials can withstand higher temperatures, allowing turbochargers to operate more efficiently and reliably for longer periods of time.

It is also important to note that intelligent control systems can revolutionize turbocharger performance. Using real-time data and sensors, such systems can adjust turbocharger operation based on current driving conditions, optimizing air delivery, fuel combustion and exhaust emissions. This will lead to further improvements in efficiency and lower emissions.

Watson and Janota offer a thorough overview of the principles behind turbochargers in internal combustion engines, emphasizing key design aspects, efficiency, and methods for increasing engine power. The focus is on thermodynamics and design solutions for various engine types. This work is valuable for engineers involved in turbocharger design and optimization, as well as for researchers working to enhance engine performance. It may also be helpful for engineering students in related fields.

Baines provides a fundamental guide to the design and operation of turbochargers, covering the physical and engineering principles of turbomachinery, including airflow analysis,

thermal processes, and fluid dynamics. Different turbocharger configurations and their applications in various engines are discussed. This work is useful for students of thermodynamics and mechanical systems, as well as professionals seeking to advance turbine technology.

Guzzella and Onder present methods for mathematical modeling and control of internal combustion engine systems, including turbocharging systems. Their detailed models help predict system behavior and optimize performance. This book is valuable for engineers designing control systems for turbocharged engines and for researchers developing new methods to improve engine efficiency and reduce emissions.

Heywood offers an in-depth exploration of the physics and thermodynamics of internal combustion engines, including turbocharging mechanisms. This comprehensive guide is essential for anyone studying or working with automotive engineering and internal combustion engines. It serves as a fundamental reference, beneficial for both students and practicing engineers.

Schwaller provides a practical guide to diagnosing, repairing, and rebuilding automotive engines, with a focus on turbochargers. Detailed descriptions of common engine faults, troubleshooting methods, and fundamental engine system concepts are included. The book highlights practical aspects of turbocharger repair and performance enhancement, making it a valuable resource for automotive mechanics, repair technicians, and engineering students.

Backé and Winterbone delve into advanced turbocharging technologies and their applications in internal combustion engines. Special attention is given to thermodynamic aspects and aerodynamic characteristics of modern turbines. Their analysis of various turbocharging systems and their potential to improve engine performance is essential for researchers and engineers looking to optimize existing turbine systems.

Dixon and Hall discuss the fluid dynamic and thermodynamic principles of turbomachinery, including turbochargers, from both theoretical and practical perspectives. They cover key aspects of turbomachinery performance, making this book a valuable reference for engineers and students engaged in the design of turbochargers. It can also serve as a textbook in courses on aerodynamics and thermodynamics.

Rajoo and Romagnoli present a modern take on turbocharger concepts and design. They review innovative turbine design methods, including the use of new materials and advanced control approaches. This book is useful for professionals working to improve the performance of turbocharged engines and for researchers exploring new turbocharger technologies.

Eriksson and Nielsen provide a detailed overview of engine and drivetrain modeling and control techniques, with a particular focus on systems featuring turbochargers. They present state-of-the-art approaches to turbocharger control aimed at improving efficiency and reducing emissions. This book is designed for engineers and researchers developing control systems for modern engines and will also benefit engineering students.

Stone analyzes the physical processes of internal combustion engines and explains how turbochargers can improve engine performance and efficiency. This work is beneficial for students and engineers seeking a foundational understanding of engines and supercharging systems. It also discusses current trends in internal combustion engine design.

Garrett provides a practical guide to upgrading and tuning turbochargers, written for a broad audience, including enthusiasts and mechanics. He explains how turbochargers function and outlines various modifications that can improve their performance. This source is useful for those involved in tuning engines to increase power and speed.

Perryman and Winterbone focus on turbocharging in diesel engines, analyzing the design features of turbochargers for diesel systems and suggesting ways to enhance their efficiency. This work is essential for engineers working with diesel engines and researchers aiming to improve the environmental performance of diesel vehicles by modernizing turbochargers.

Hirsch and Denton discuss advanced methods for optimizing the aerodynamics of turbomachines, including turbochargers. Their analysis of improving turbocharger efficiency through blade shape and configuration optimization is crucial for engineers designing high-efficiency turbines.

Visser and Hoekstra emphasize the latest developments in turbocharger technology and its role in improving fuel efficiency. This book is useful for researchers working on emission reduction and overall engine performance improvements.

Langston provides a foundational introduction to the workings of turbomachinery, focusing on both theoretical principles and practical applications. He offers a detailed explanation of key concepts in aerodynamics and thermodynamics, making this work useful for students and engineers seeking a fundamental understanding of turbomachinery and its application to engineering problems.

Methods and Materials

This paper is based on an extensive review of literature, industry reports, and technical analyses on the development and future of turbochargers in automotive engines. The study focuses on how the evolution of turbochargers has affected engine performance and their ability to meet today's environmental challenges.

Sources of information:

Historical data on the development of turbochargers was gathered from various engineering archives, technical documents, and historical materials describing the use of turbochargers in racing and industrial vehicles.

Contemporary research from academic journals, engineering reports, and environmental analyses was used to analyze the latest technologies, such as variable geometry turbochargers (VGTs), and their impact on meeting environmental standards, including Euro-6 and upcoming Euro-7 regulations.

Forecasts and studies were used to analyze the future application of turbochargers in hybrid and electric vehicles, and to evaluate current innovations in materials and design.

Method of analysis:

The evolution of turbochargers was examined through a comparative analysis of key milestones in their development, focusing on changes in efficiency, materials used, and technology solutions. The study included analysis of fuel economy, power and emissions data for turbocharged engines of different generations.

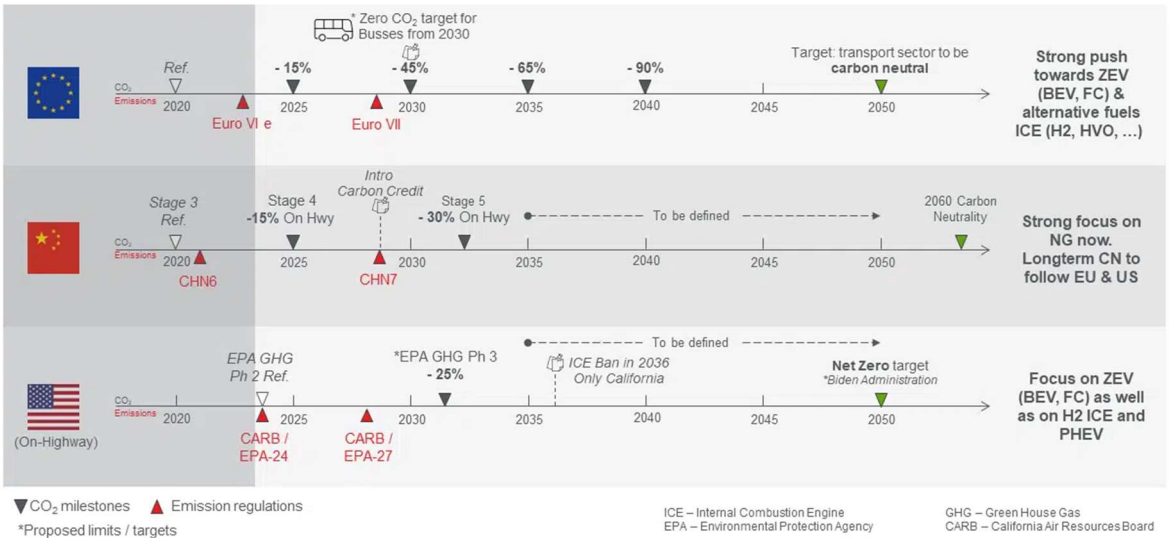
Special attention was given to analyzing advanced materials such as ceramic alloys that allow turbochargers to operate at higher temperatures and pressures. The use of 3D printing technologies to optimize component design and reduce weight was also explored.

Technology Resources:

Computer simulations such as CFD (Computational Fluid Dynamics) were used to analyze the performance of modern turbochargers. These tools helped illustrate how improvements in turbocharger aerodynamics contribute to improved performance and reduced energy loss.

The use of 3D printing was also explored as a method of creating lighter and more aerodynamic components, which helps improve turbocharger efficiency and durability.

Results



Analyzing the development of turbocharger technology from its historical use to modern advances shows significant improvements in engine performance and significant reductions in emissions. Initial turbocharger models developed to increase power in aviation and motorsports provided only limited benefits in terms of fuel economy and emission reductions.

With the introduction of technologies such as variable geometry turbochargers (VGTs) and the use of high-performance materials such as ceramic alloys, modern turbochargers have made significant advances. Current evidence suggests that turbocharged engines can improve fuel economy by 20% over atmospheric engines, while significantly reducing CO_2 emissions.

In addition, turbochargers have become an important tool for automakers to help meet stringent environmental standards such as Euro-6. In the future, they will play a key role in achieving the more stringent Euro-7 standards.

Discussion

An analysis of turbochargers, taking into account both their historical development and modern innovations, shows a trend toward continually improving engine efficiency and reducing environmental impact. Whereas early turbochargers provided mainly an increase in engine power, modern developments offer significant improvements in fuel economy and emission reductions.

Modern technologies such as variable geometry turbochargers and electric turbochargers (E-Turbos) significantly improve not only engine performance but also environmental performance. Studies show that these innovations can reduce CO_2 emissions by 15%, while delivering fuel efficiency gains of 5-10%.

However, challenges remain in further optimizing turbocharger technology for today's powertrains. As the automotive industry shifts to hybrid and electric systems, the role of turbochargers is being transformed. In hybrid engines, they help reduce engine size and weight without sacrificing performance, which is particularly important to meet global environmental goals.

At the same time, improvements are needed in cooling systems, the use of more durable materials and the introduction of intelligent control systems that will adapt to real-time driving conditions to optimize turbocharger performance.

With stricter environmental regulations such as Euro-7, turbocharger technology will need to meet new challenges. This may include the use of turbochargers in hydrogen-powered engines (H2-ICE) and integration with electric motors to improve both power and environmental

performance. Continuous innovation in this area will be key to meeting the twin objectives of improving performance and reducing environmental impact.

Conclusion

The evolution of turbocharger technology clearly demonstrates its important role in enhancing engine performance and reducing environmental impact. From their early beginnings in aviation and motorsports to their ubiquitous use in mass-market automobiles, turbochargers have continued to evolve to meet the growing demands for efficiency and environmental performance. Modern advances such as electric turbochargers (E-Turbos) and variable geometry turbines (VGTs) not only improve fuel efficiency but also significantly reduce emissions, meeting global standards such as Euro-6 and preparing to meet the more stringent Euro-7 requirements.

The role of turbochargers in hybrid and hydrogen powertrains is also becoming increasingly significant, pointing to their importance in the transition to cleaner vehicle technologies. However, to meet future challenges, further developments are needed to improve cooling systems, material durability and intelligent control systems.

Ultimately, turbochargers will remain a key technology to help meet environmental goals and improve engine efficiency, helping the automotive industry reduce its overall carbon footprint and meet tightening emissions standards.

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Keywords

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An analysis of Gas Cylinder equipment and its Economic impact: Past, present, and future

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Abstract.
The aim of the article is to explore the historical development, current state, and future potential of gas cylinder technology.The study examines the historical evolution of gas cylinders, initially used in industrial settings, and their growing importance in sectors such as transportation and energy. Presently, the widespread adoption of compressed natural gas (CNG) and hydrogen fuel cylinders has contributed to significant cost savings and environmental benefits, particularly by reducing fuel costs in transportation and promoting cleaner energy alternatives. The research also highlights the potential future impact of innovations in gas cylinder technologies, such as lighter materials and enhanced safety features, which are expected to lower production costs and increase accessibility, particularly in emerging markets. Overall, gas cylinder equipment continues to play a crucial role in driving economic growth and sustainability in an evolving global energy landscape.

Introduction

In recent years, the Republic of Kazakhstan has prioritized the modernization and development of key industries as part of its long-term economic strategy. The gas sector, particularly the use of gas cylinder equipment, plays a pivotal role in Kazakhstan's industrial and economic landscape. This focus on gas cylinder technology aligns with the objectives outlined in the President’s annual address to the nation, where the importance of sustainable economic growth, technological innovation, and environmental responsibility are emphasized. The President’s message calls for the advancement of critical infrastructure and the adoption of new technologies that ensure energy efficiency and safety. These imperatives make the study of gas cylinder equipment both timely and relevant in Kazakhstan’s broader socio-economic context.

The aim of the article is to explore the historical development, current state, and future potential of gas cylinder technology. Given the increased focus on industrial safety, environmental concerns, and economic sustainability, this topic holds significant relevance. The analysis will examine how gas cylinder innovations have contributed to Kazakhstan’s industrial sectors, including energy, transport, and manufacturing, while also considering how these developments align with global standards and the President’s call for technological innovation and economic diversification.

The relevance of this article lies in its ability to bridge technological advancements with Kazakhstan’s current economic goals. Gas cylinders are essential for a wide range of applications, from domestic energy use to industrial processes, and their efficient management directly impacts the country’s energy policies and economic performance. The global push toward safer, more durable, and environmentally friendly equipment further highlights the need for Kazakhstan to

modernize its gas infrastructure. As the country strives to achieve sustainable growth, as outlined in the President's vision, understanding the economic impact of gas cylinder technologies becomes crucial. Moreover, with increasing demand for cleaner energy solutions, the shift toward innovative gas technologies is expected to play a key role in reducing environmental harm while boosting economic productivity.

In analyzing gas cylinder equipment and its economic implications, several critical issues must be addressed. First, the safety standards governing gas cylinders are of paramount importance. While there have been technological advancements, many challenges persist, including the need to ensure compliance with both international and national safety standards. Second, the economic efficiency of gas cylinder usage needs thorough examination. This involves evaluating the costs associated with supply chains, transportation, and production, and how these factors affect the broader economy. Third, the environmental impact of gas cylinder production, use, and disposal poses a significant challenge. The industry must address concerns about waste management, recycling, and the overall carbon footprint of gas cylinder operations.

Additionally, regulatory barriers can slow the adoption of new technologies. Stricter standards can increase operational costs, yet they are essential for maintaining safety and environmental compliance. Moreover, in emerging economies like Kazakhstan, it is crucial to explore how modern gas technologies can be integrated into existing infrastructure without causing significant disruptions or economic strain.

To address these challenges, the article will propose several solutions. First, there needs to be a focus on enhancing the safety standards of gas cylinder equipment through the adoption of international best practices and stronger regulatory enforcement. Implementing more robust inspection and certification processes can ensure that safety is not compromised as new technologies are introduced. Additionally, developing a cohesive national framework for gas cylinder usage can help streamline safety protocols across industries.

Second, optimizing the economic efficiency of gas cylinder systems requires a comprehensive analysis of the supply chain. By modernizing transportation logistics, improving storage practices, and automating production, costs can be reduced significantly. Investments in research and development for advanced materials, as discussed by experts like Olson and Turner, will also contribute to long-term cost efficiency by extending the lifespan of cylinders and reducing maintenance costs.

Finally, to mitigate the environmental impact, the industry must focus on recycling and adopting eco-friendly materials in cylinder production. The integration of innovative materials, as proposed by Olson, will not only improve safety but also reduce the environmental footprint of gas cylinders. Moreover, incentivizing recycling programs and developing policies that support a circular economy will help Kazakhstan meet both its economic and environmental objectives.

1. The Past: Origins and Early Economic Influence

Gas cylinder equipment has been a key component in energy storage and fuel transportation since the early 20th century. Initially developed for industrial use, these systems allowed businesses to store gases like oxygen, nitrogen, and propane in a more controlled and portable manner. The economic impact was significant, as industries such as welding, manufacturing, and chemical production could operate more efficiently, reducing the costs associated with gas procurement and transportation. In the early stages, however, the high cost of manufacturing cylinders and maintaining safety standards limited widespread adoption, confining their economic benefits to large-scale industries.

2. The Present: Expanding Markets and Economic Integration

Today, gas cylinders are an essential part of not only industrial operations but also domestic and commercial markets. With advancements in technology and the growing demand for alternative fuels, gas cylinder equipment has become more affordable and efficient. For example, in the

automotive sector, compressed natural gas (CNG) cylinders have revolutionized fuel consumption, providing a cost-effective and environmentally friendly alternative to traditional fuels. The economic impact is visible in sectors like transportation, where the use of CNG reduces fuel costs and emissions, contributing to broader economic growth. Additionally, the proliferation of gas cylinder equipment in emerging markets, particularly in countries that prioritize energy diversification, has created new economic opportunities, fostering industries around cylinder production, distribution, and maintenance.

3. The Future: Technological Advancements and Economic Potential

Looking ahead, the future of gas cylinder equipment is poised for further innovation and economic expansion. With the global shift toward clean energy, the demand for hydrogen gas cylinders is expected to rise, driven by advancements in fuel cell technology. This transition offers potential economic benefits by reducing reliance on fossil fuels and opening up new markets for renewable energy solutions. Innovations in lightweight materials and enhanced safety features are also projected to lower production costs and increase accessibility, driving further economic integration. The continued development of gas cylinder technologies will likely play a crucial role in the global economy, offering industries more sustainable, cost-efficient energy options while creating jobs and fostering economic growth.

Sheldon, D. covers the history of gas cylinder development and their safety standards. The author a safety perspective. The research emphasizes the importance of adhering to international norms in gas equipment operation and offers recommendations for improvement. The economic aspect of implementing new standards is also presented.

Miller's work provides an in-depth historical overview of industrial gas cylinders, from early designs to modern technological advancements. The book discusses the introduction of new materials and innovations that have enhanced the efficiency of gas cylinders. Miller examines the economic implications of these advancements, focusing on cost reduction and operational efficiency. This comprehensive analysis offers insights into the evolution of industrial gas cylinders and their critical role in various industries.

Watson's book emphasizes the environmental challenges and economic benefits of gas cylinder use. The author examines the environmental impact of gas cylinders throughout their lifecycle, from production to disposal. The book explores the potential for recycling as a means to reduce costs and mitigate environmental damage. Watson also discusses how environmentally friendly practices can provide economic advantages, making this work essential for understanding the intersection of sustainability and the gas cylinder industry.

Henderson, M. research focuses on the logistics and economic considerations of gas cylinder supply chains. Henderson provides an in-depth analysis of transportation, storage, and supply risks, along with methods to optimize economic efficiency in volatile markets. The book offers valuable insights into how companies can minimize costs and improve operational performance in the distribution of gas cylinders, making it particularly relevant for supply chain management professionals.

Olson's work highlights the latest innovations in gas cylinder materials, emphasizing their impact on cost, durability, and future applications. The book discusses the materials used in the construction of gas cylinders and how advancements in this area can lead to significant economic benefits. Olson provides a forward-looking perspective on the future of gas cylinder materials, making the work a useful resource for professionals interested in materials science and its economic implications.

Carter's book explores the regulatory frameworks that govern the use of gas cylinders, with a focus on international and national safety standards. The author examines the economic consequences of complying with these regulations, including the costs of production and

operation. Carter also provides an analysis of how stricter safety regulations can affect the gas cylinder industry, making this work relevant for policymakers and industry leaders.

Bell's book investigates the safety considerations involved in the transportation of compressed gas cylinders. The author analyzes current safety standards and offers solutions to mitigate risks associated with transportation. Bell also discusses the economic implications of ensuring safe transportation, including compliance costs and the financial benefits of preventing accidents. This work is particularly useful for professionals involved in logistics and transportation safety.

Turner's work focuses on recent technological advancements in the production of gas cylinders. The book provides a detailed analysis of how automation and other modern manufacturing techniques have improved the efficiency and cost-effectiveness of production. Turner also explores the implications of these advancements for the overall quality of gas cylinders, making the work relevant for those involved in manufacturing and production optimization.

Simmons examines global trends in the usage of gas cylinders, providing data on market developments and forecasting future changes. The book discusses the economic impact of these trends on various markets, particularly in developing countries. Simmons offers predictions for growth in global gas cylinder markets, making this work an essential resource for businesses looking to expand in international markets.

Morgan's book analyzes the economic effects of gas cylinder usage in emerging economies. The author explores how the adoption of modern gas cylinder technologies can promote economic growth in these regions. Morgan also provides insights into the future development of the gas cylinder industry in emerging markets, making this work particularly relevant for economists and industry leaders focused on global economic development.

Methods&Material

This analysis of gas cylinder equipment and its economic impact draws upon a combination of historical data, current market reports, and industry-specific case studies. The research was conducted using a qualitative approach, reviewing academic articles, industrial white papers, and market analysis reports to examine the technological evolution and economic role of gas cylinder equipment across different sectors. Key materials included studies on the development of compressed natural gas (CNG) and hydrogen fuel technologies, as well as data on the economic contributions of gas cylinders in transportation, energy, and manufacturing. Additionally, statistical data from global energy markets and reports from environmental agencies were utilized to evaluate the economic and environmental benefits of modern gas cylinder technologies. This combination of historical and contemporary sources provided a comprehensive understanding of the economic trajectory of gas cylinder equipment from its inception to its projected future impact.

Results

Category	Details/Findings
Historical Impact	Significant cost reductions in fuel storage and transportation for industrial sectors (e.g., manufacturing, energy).
Current Economic Benefits	- 40% reduction in fuel costs in transportation with widespread use of CNG systems. - Growing adoption of hydrogen fuel cylinders contributing to economic efficiency and environmental benefits.
Environmental Benefits	Use of gas cylinder equipment (e.g., CNG and hydrogen) reduces emissions and supports sustainability efforts.
Future Projections	- Technological innovations (e.g., lightweight materials, improved safety) expected to lower production costs by 15-20%. - Expanding markets in clean energy sectors (hydrogen).
Overall Impact	Continued role of gas cylinder equipment in driving economic growth, particularly in energy and transportation sectors.

The analysis reveals that gas cylinder equipment has had a steadily increasing economic impact across multiple industries. Historically, its adoption in manufacturing and energy sectors led to significant cost reductions in fuel storage and transportation, with industrial gases becoming more accessible. In the present day, the widespread use of gas cylinders, particularly in transportation through compressed natural gas (CNG) systems, has reduced fuel expenses by up to 40% in regions where CNG infrastructure is developed. Additionally, the introduction of hydrogen fuel cells has started to reshape the energy landscape, offering an eco-friendly alternative that is projected to generate new economic opportunities in the clean energy sector. Future projections indicate that innovations in gas cylinder technologies, such as lightweight materials and improved safety features, will drive down production costs by 15-20%, further expanding their economic benefits. Overall, gas cylinder equipment continues to play a crucial role in economic development, with potential for even greater contributions as global energy needs shift towards sustainability.

Discussion

The findings highlight the transformative role that gas cylinder equipment has played in shaping various industries, particularly in terms of economic efficiency and environmental sustainability. The historical progression from industrial use to broader applications in transportation and clean energy demonstrates the adaptability and economic importance of gas cylinders. In the present, sectors like automotive and manufacturing have particularly benefited from cost savings associated with compressed natural gas (CNG), showcasing how technological advancements can stimulate economic growth by lowering operational expenses. However, challenges such as infrastructure development and initial costs of transitioning to gas-based systems remain barriers in some regions, limiting the full economic potential.

Looking to the future, the integration of hydrogen fuel cylinders presents significant economic and environmental opportunities, aligning with global efforts to reduce carbon emissions. Yet, the success of these systems will depend on continued investment in research, infrastructure, and policies promoting clean energy adoption. As materials science improves, the production of more affordable, lightweight cylinders will further enhance their economic impact, particularly in emerging markets. The discussion underscores the need for a collaborative effort between industries, governments, and innovators to fully harness the economic benefits of gas cylinder technologies in the future.

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SÜNİ İNTELLEKT

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Xülasə

Bu məqalə ***insan məntiqinin maşınlarda tətbiqini nəzərdə tutan elm*** *haqqındadır.* ***Eyniadlı film*** *üçün* ***Süni intellekt (film)*** *səhifəsinə baxın*üni intellektin (Artificial intelligence, AI) əsası keçən əsrin ortalarında qoyulub. O, insan kimi düşünən və qərar qəbul edə bilən texniki qurğuların, intellektual proqram, sistem və robotların yaradılmasını özündə ehtiva edir. Süni intellekt riyazi elm və texnologiya olaraq ən çox investisiya qoyulan və maraq doğuran sahələrdəndir. AI-dən aviasiya, təhsil, səhiyyə, maliyyə, ağır sənaye, neyrocərrahiyyə və digər sahələrdə daha çox istifadə olunur.

Summary

This article is about the science of applying human logic to machines. For the film of the same name, see Artificial intelligence (film) page Artificial intelligence (AI) was founded in the middle of the last century. It includes the creation of technical devices, intelligent software, systems and robots that can think and make decisions like humans. Artificial intelligence is one of the most invested and interesting areas of mathematical science and technology. AI is increasingly used in aviation, education, healthcare, finance, heavy industry, neurosurgery, and more.

Резюме

Эта статья о науке применения человеческой логики к машинам. Одноименный фильм см. на странице «Искусственный интеллект» (фильм). Искусственный интеллект (ИИ) был основан в середине прошлого века. Оно включает в себя создание технических устройств, интеллектуального программного обеспечения, систем и роботов, способных думать и принимать решения, как люди. Искусственный интеллект — одна из наиболее инвестируемых и интересных областей математической науки и технологий. ИИ все чаще используется в авиации, образовании, здравоохранении, финансах, тяжелой промышленности, нейрохирургии и т. д.

Açar sözlər: Süni intellekt,Robotlar,Turinq maşını

Keywords: Artificial intelligence, Robots, Turing machine

Ключевые слова: Искусственный интеллект, Роботы, Машина Тьюринга.

Dünya şöhrətli yazıçı Den Broun son romanı olan "Başlanğıc”da süni intellektin yeni tanrı olacağını və kompüterlər vasitəsilə yeni bir dinin formalaşdırılacağını irəli sürüb. Bəs nədir bu süni intellekt?

Əsası keçən əsrin ortalarında qoyulan süni intellekt son zamanların ən çox investisiya qoyulan və maraq doğuran sahələrindəndir.

Süni intellekt - insan məntiqini maşınlarda tətbiq etmək məqsədi daşıyan riyazi elm və texnologiyadır. Bu elm intellektual maşın yaratmağı, xüsusən yalnız insanlara məxsus olduğu

düşünülən yaradıcı fəaliyyət göstərən intellektual proqram yaratmağı özünə məqsəd götürüb. Eyni zamanda insan intellektinin araşdırılması kimi də başa düşülür.

Bu sahə insanın ən dəyərli mülkiyyəti olan intellektin maşınlar tərəfindən dəqiq şəkildə simulyasiya olunması məqsədilə yaradılıb və inkişaf etdirilib. Süni intellekt yaradıldığı gündən bəri müxtəlif optimist və pessimist fikirlərlə qarşılaşsa da, bu gün texnologiyanın inkişafında mühüm yer tutur. Onun tətbiqində elm və mühəndislikdən geniş şəkildə istifadə olunur.

Yaranma tarixi

İntellektə malik olan maşınlar və digər süni aparatlar barəsində yazılı fikirlərə hələ qədim yunan miflərində rast gəlinir. İntellektə malik avtomatlaşdırılmış maşınlar Heron, Əl Cəzirə, Volfqanq von Kempelen, Cabir ibn Həyyan, Parasels və digər ixtiraçılar tərəfindən qədim dövrlərdən bəri hazırlanmışdı. E.ə. IV əsrdə yaşamış Aristotel süni intellekt düşüncəsinin əsasını təşkil edən sillogizm nəticələr nəzəriyyəsinin əsasını qoymuşdu. 1275-ci ildə Roman Llull özünün "Ars Maqna" adlı məntiq aparatını ixtira etmişdi. İstifadəçi ora xristianlıq haqqında öz sualını daxil edir və aparat insanın köməyi olmadan dərhal avtomatik bu suala cavab tapırdı. Bu aparat müsəlmanları xristianlaşdırmaq məqsədilə yaradılmışdı.

Süni intellekt haqqında ilk fikirlər mexaniki materealizmin yaranması ilə, Dekartın "Metod haqqında mühakimələr" və Tomas Qobbsun "İnsan təbiəti" əsərlərində öz əksini tapıb. 1943-cü ildə U.Mak Kallok və U.Pitts öz məqalələrində süni neyron sistemi anlayışını təklif ediblər. D.Xebb 1949-cu ildə "Davranış orqanizasiyası" əsərində neyronların öyrənilməsinin əsaslarını göstərdi. Bu fikirləri bir neçə il sonra amerikan neyrofizioloq Frenk Rosenblatt inkişaf etdirdi. O, insan davranışlarını modelləşdirən mexanizm yaratmağı təklif etdi və onu "Perceptron" adlandırdı.

Süni intellekt ifadəsi ilk dəfə 1956-cı ildə Con Makkarti tərəfindən istifadə olunub. O, bu ifadəni işlədərkən süni intellekti "maşınları intellektual etmək elmi və mühəndisliyi" adlandırıb.

Turinq testi

Kompüter elminin atası sayılan, riyaziyyatçı, kriptoqraf, informatika elminin yaradılmasında böyük rol oynayan ingilis alim Alan Turinq isə süni intellekt haqqında ilk fikirlərini 1950-ci ildə "Mind" jurnalında çap edilmiş "Hesablama maşınları və şüur" məqaləsində bildirib. O, həmin məqalədə insanla kompüter arasında gedən testdən bəhs edirdi. Belə ki, bu test bir insan, bir kompüter və bir münsiflə aparılır. Münsif nə kompüteri, nə də insanı görə bilir, sadəcə onlarla dialoq aparır, sual-cavab edir. Münsifin sualları və təcrübədə iştirak edən kompüter ilə insanın verdiyi cavablar bir ekranda yazılı olaraq görünür. Məqsəd münsifin verilən cavablar əsasında hansının insan, hansının kompüter olduğunu tapmasıdır. Turinq deyir ki, kompüter o zaman süni intellektə sahib ola bilər ki, o, münsifi çaşdırsın və münsif onunla insanın, yoxsa kompüterin danışdığını başa düşə bilməsin. Test zamanı münsif bu fərqi aydınlaşdıra bilmirsə, deməli, həmin kompüter mükəmməl süni intellektdir.

Turinqin bu ideyası hazırda "Turinq testi" adlandırılır və süni intellektin yaradılmasında gedən araşdırmalarda ondan hələ də istifadə edirlər. Test kompüterin və ya başqa bir sistemin insanlarla eyni zehni bacarığa sahib olub-olmadığını müəyyən etmək məqsədi daşıyır. Ümumi mənada bu test bir mütəxəssisin, maşının performansı ilə bir insanınkını ayırd edib etməyəcəyini ölçür. Əgər ayırd edə bilməzsə, deməli, maşın insanlar qədər zehni bacarığa sahibdir. Hələ ki, Turinq testini keçən kompüter, maşın olmayıb. Lakin belə düşünülür ki, ideal virtual söhbət proqramı Turinq testini keçə biləcək...

Turinqin bu yanaşması süni intellekt araşdırmalarının ən ibtidai forması idi. Aradan keçən illərdə bu sahədə daha ciddi kəşflər edildi və süni intellektin həyatımızda nüfuzunu hiss etməyə

başladıq; SİRİ kimi proqramlar vasitəsilə kompüterlə ünsiyyət qurub ondan cavablar almaq artıq heyrətləndirici hadisə deyil və ya şahmat oyununda kompüterə uduzmaq da normal hal sayılır.

Süni intellektin üç növü məlumdur

Bunlar:

- Məhdudlaşdırılmış süni intellekt. Bu tip intellekt sizi, məsələn, şahmatda uda bilər. Amma ona "torpağı yemək olarmı?" sualını versəniz, cavab ala bilməzsiniz.
- Ümumi süni intellekt. Bu növ insan intellektinə maksimum yaxındır. O, məlumatları təhlil edir, digər maşınlarla ünsiyyətə girir, özünü təlimdən keçirir.
- Süni super intellekt. Bu intellekt növü o qədər inkişaf edib ki, insan intellektindən fərqlənir. Başqa sözlə, bizim intellektimiz həmin super intellektin motivlərini anlamaq üçün yetərincə inkişaf etmiş deyil.

İnsan intellektindən daha güclü bir intellektin yaradılması isə bu elmin əsas məqsədlərindəndir.

Bu gün bəşəriyyət süni intellektin birinci tipinin əsas prinsiplərini uğurla mənimsəyib. Artıq birinci çərçivədən kənara çıxmağa can atan şirkətlər var. Bir çoxları hesab edir ki, məhz "Google" ümumi süni intellekti dünyaya ilk dəfə təqdim edəcək. Bəs alimlər ümumi süni intellekti nəzarət altında saxlaya biləcəklərmi? Ümumi intellektin super intellektə qədər böyüməsini görə biləcəklərmi?

Süni intellekt qlobal hegemonluq uğrunda mübarizədə yeni rəqabət alətinə çevrildi

Təkcə ötən il ərzində süni intellektə özəl investisiyalar iki dəfə artaraq **93,5 milyard** ABŞ dolları olub. Ən çox investisiya məlumatların emalı və idarəolumasına, eləcə də bulud texnologiyalarına yatırılıb. Sonrakı yerlərdə tibb və səhiyyə, maliyyə texnologiyaları, audiovizual vasitələr, yarımkeçiricilər, sənaye avtomatlaşdırılması, pərakəndə ticarət gəlir. İnvestisiyaların həcminə görə **52,9 milyard** dollarla ABŞ liderlik edir. İkinci yerdə Çin (**17,2 milyard** ABŞ dolları) qərarlaşıb. Əgər 2010-cu ildə süni intellekt mövzusunda nəşrlərin sayı **162,5 min** idisə, 2021-ci ildə bu göstərici **334,5 min**ə çatıb. İki ən iri kateqoriyanı jurnal məqalələri (**51,5** %) və konfranslardakı hesabatlar (**21,5** %) təşkil edir. Hər iki kateqoriyada liderlik Çinə məxsusdur.

Çinin kommunist partiyasının süni intellektə dövlət baxışı daha əvvəl formalaşsa da, məhz 2016-cı ildə köklü şəkildə dəyişdi. Həmin ilin martında **2 min** ildən artıq yaşı olan Çinin milli intellektual oyunu "Go"da **18** qat dünya çempionu süni intellekt əsaslı "AlhaGo" proqramına məğlub oldu. Bu hadisə əsl şok effekti yaratdı. 2017-ci ildə isə Çində "Yeni Nəsil Süni İntellektin İnkişafı üzrə Plan" qəbul edildi. Çin süni intellekti beynəlxalq rəqabətin yeni sferası kimi görməyə başladı və 2030-cu ilə kimi bu sahədə dünya liderinə çevrilməyi hədəfləyir.

İnsanı tam əvəz edə bilməsə də, onun bir çox funksiyasını mənimsəyib

Bu gün Çində süni intellekt texnologiyaları müxtəlif sektorlarda, o cümlədən səhiyyə sistemində geniş istifadə olunur. Aparıcı klinikaların arxiv məlumatları əsasında yaradılmış CDSS (Clinical Decision Support System) sistemi regionlarda həkim çatışmazlığını aradan qaldırmağa kömək edir. Həmin sistemdə həkimlər simptomları və müxtəlif yardım variantlarını görə bilirlər, bu isə müalicə prosesini tezləşdirir. Bu, xüsusilə işə təzə başlayan mütəxəssislər üçün daha əhəmiyyətlidir. Bundan başqa, süni intellekt əsaslı virtual asistent proqramı həkim müalicəsinə əlavə olaraq 7/24 iş rejimində konsultasiya xidməti göstərir. Bu zaman anonimliyə icazə verildiyindən xəstələr həssas məsələlərini söyləməkdə daha rahat olurlar. Real həkimdən fərqli olaraq, süni intellekt xəstənin sözünü kəsmir və ona narahatlığını ətraflı təsvir etməyə imkan verir.

Çinin bir çox şəhərlərində yol hərəkətinin effektivliyinin artırılması üçün süni intellekt əsaslı sistemlərdən istifadə edilir. Ölkənin texnologiya nəhəngi "Baidu"nun hazırladığı ağıllı işıqforlar şəhərlərdən birində səhər və axşam vaxtı pik saatlarda gözləmə vaxtını 30 %-ə kimi azaldıb. Həmin cihazlar nəqliyyat və sərnişin axınları barədə məlumat toplayaraq onları təhlil edir və yol situasiyasını proqnozlaşdırmaqla hərəkəti optimallaşdırır. Başqa bir şəhərdə yaradılan yol hərəkətinin intellektual idarəolunması sistemi maşın öyrənməsinin geniş imkanlarından istifadə edərək tıxacların tipik modelləri barədə təsəvvür əldə etməklə potensial yol hadisələrini baş verməmişdən əvvəl müəyyən etməyə imkan verir. Şəhərdə quraşdırılan yüksək "zoom"lu geniş ekranlı kameralar real vaxt rejimində qırmızı işıqda keçmə, qadağan olunan dönmə hərəkəti, hərəkət zolağını qanunsuz dəyişmə kimi qeyri-qanuni manevr edən nəqliyyat vasitələrini çəkir. Sistem yoldakı vəziyyət haqqında böyük həcmli məlumatları və intellektual kameralardan gələn informasiyanı təhlil edərək hansı yol kəsişmələrində nə zaman tıxacın yarana biləcəyini proqnozlaşdıra bilir. Bu, polisə tıxacların qarşısını almaq üçün önləyici tədbirlər həyata keçirməyə imkan verir.
Bu yaxınlarda Çinin dövlət elektrik şəbəkəsi şirkəti elektrik enerjisinin paylanması üçün ölkənin ən güclü süni intellektini istifadəyə verib. Adətən elektrik enerjisindəki kəsintilər zamanı problemi həll edib, elektrik enerjisi verilişini bərpa etmək üçün 6-10 saat vaxt lazımdır. Süni intellekt bu vaxtı 3 saniyəyə endirəcək. Bu texnologiya elektrik sərfiyyatına qənaət etməyə imkan verir. Belə ki, süni intellekt yeni istifadəyə verilən Xançjou-Şaosin-Tayçjou yüksək sürətli dəmir yolu xəttində bütün əməliyyatlara inteqrasiya olunub. Bu da elektrik enerjisinə 30 %-ə kimi qənaət etməyə imkan verir.

Robotlar cinayət törətdikləri halda məsuliyyəti kim daşıyır?

Hazırda süni intellektlə müzakirə olunan ən aktual mövzulardan biri də belə bir vəziyyətdə kimin məsuliyyət daşıması məsələsidir. Çünki mövcud qanunlara görə, cinayət əməli törədildikdə məsuliyyəti ancaq hüquqi öhdəlikləri olanlar daşıyırlar və təbii olaraq, cəza da onlara verilir. Yəni, hüquq pozuntularına görə ancaq insanlar məsuliyyət daşıyırlar.
1981-ci ildə Yaponiyada motosiklet fabrikində robot texniki xəta səbəbindən idarəetməni itirərək bir işçinin ölümünə səbəb olmuşdu. O vaxtdan 40 ildən çox müddət keçib və hazırda bu məsələ hüquqla tənzimlənməyib.

Mərmərə Universitetinin hüquq fakültəsinin professoru Zəfər İçərin sözlərinə görə, süni intellekt hüquqi anlayışları dəyişdirə biləcək çox mühüm texnoloji inqilabdır. Robotun şəxsiyyətinin tanınıb tanınmaması ilə bağlı müxtəlif fikirlər səslənsə də, bu mövzuda müzakirələr davam edir. Bəzi mütəxəssislər buna ehtiyac olmadığını və süni intellektin əmtəə kimi qəbul edilməsi ilə bütün hüquqi problemlərin həll oluna biləcəyini söyləyirlər. Bu məsələdə fikir ayrılığının olması şübhəsizdir. Süni intellekt azad iradəyə malik olarsa, onun gələcəkdə insanlar kimi cəzalandırılması mümkün ola bilər.

Azərbaycanda süni intellekt sahəsi necə inkişaf edir?

Prezident İlham Əliyevin uzaqgörənliyi və liderliyi ilə Azərbaycanda süni intellekt sahəsində də tərəqqi mövcuddur. Təbii ki, rəqəmsallaşma və innovasiyalara sadiqlik texnoloji inkişaf və artım üçün əlverişli mühit və zəmin yaradıb. Ölkəmiz bu sahədə regionda liderdir, iqtisadi və sosial inkişaf üçün texnologiyanın gücündən istifadə etmək istəyən digər ölkələr üçün model rolunu oynayır.
Azərbaycan hər zaman yeniliklərə açıq olması ilə fərqlənir. Bu baxımdan Səudiyyə Ərəbistanı vətəndaşı olan süni intellekt sahibi robot Sofiyanın 2018-ci il oktyabrın 23-də ölkəmizə gəlməsi və

dövlətimizin başçısı İlham Əliyevlə söhbət etməsi, həmçinin müxtəlif yerlərdə görüşlər keçirməsi diqqət çəkir. İmişli rayonuna səfəri çərçivəsində "ASAN Həyat" kompleksinin açılışında iştirak edən Prezident İlham Əliyev süni intellektin idarə etdiyi android-robotla söhbət edib.

Müasir texnologiya və innovasiyaların daim inkişaf etdiyi bugünkü dünyada unikal bacarıq və zəngin təcrübəyə malik şəxslər başqalarının həyatına əhəmiyyətli təsir göstərir. Həmyerlimiz Adəm Seymurun bu sahəyə yenilik gətirən "Digital Backpack" layihəsində "Resilience" Araşdırma Mərkəzində Dr. Maykl Unqar ilə əməkdaşlıq etməsi qürurvericidir. A.Seymurun təşəbbüsü texnologiya və sosial təsir vasitəsilə həssas uşaqların həyatlarını dəyişdirmək məqsədi daşıyır.

Azərbaycanda süni intellekt üzrə Milli Strategiyanın hazırlanması üçün yol xəritəsi artıq tərtib edilib. Bu, cari ilin fevral ayında Dördüncü Sənaye İnqilabının Təhlili və Koordinasiya Mərkəzi ilə Dünya İqtisadi Forumunun Süni intellekt və maşın öyrənməsi platforması arasında əməkdaşlıq çərçivəsində baş tutub. Rəqəmsallaşma və müasir texnoloji həllərin tətbiqi ölkəmizin iqtisadi potensialından daha səmərəli istifadə etməyə imkan verəcək.

2023-cü ilin fevral ayında Dubayda keçirilən Dünya Hökuməti Sammitində əsas diqqət süni intellekt və inkişaf etməkdə olan texnologiyalara yönəldilib. Ölkələrin qlobal yarışda rəqabətə davamlı qalması üçün süni intellekt təhsilinə sərmayə qoymasına ehtiyacı var. Azərbaycanda süni intellekt və inkişaf etməkdə olan texnologiyalar sahəsində təsirli addımlar atılır. Ölkəmizin rəqəmsallaşma və innovasiyalara sadiqliyi onu texnoloji tərəqqi uğrunda qlobal yarışın önünə çıxarıb.

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XARİCİ YADDAŞ QURĞULARI

Aidə Zamanova Lətif qızı
Azərbaycan Dövlət Pedoqoji Kollecinin müəllimi

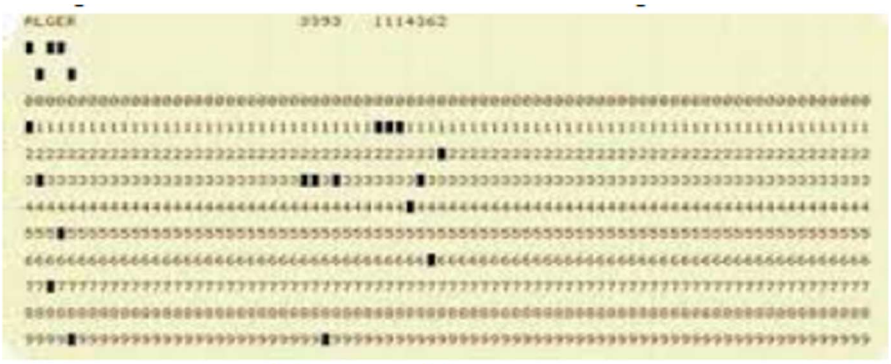
Açar sözlər: sərt disk, disk, fləş, optiki disklər, maqnit lentləri, maqnit kartları.
Key words: hard disk, disk, flash, optical disks, magnetic tapes, magnetic cards.

Xülasə
Xarici yaddaş qurğuları informasiyanın uzun müddət saxlanması üçün istifadə edilən qurğulardır. Bu qurğular informasiyanın saxlanması üçün enerjidən asılı deyil. Kompüterlərdə xarici yaddaş kimi sərt diskdən, diskdən, fləşdən, optiki disklərdən, maqnit lentlərindən, maqnit kartlarından və s. istifadə olunur. Xarici yaddaşa bəzən informasiya daşıyıcısı da deyilir. Əməli yaddaşdan fərqli olaraq bu yaddaşlardakı informasiya kompüter elektrik şəbəkəsindən ayrıldıqda silinmir. İnformasiya daşıyıcısında informasiyanın uzun müddət saxlanması üçün maqnit örtüklü materiallardan və digər üsullardan istifadə olunur. Böyük kompüterlərdə maqnit lenti və maqnit diski informasiya daşıyıcıları kimi geniş tətbiq edilir.

EXTERNAL STORAGE DEVICES

Summary
External memory devices are devices used for long-term storage of information. These devices do not depend on energy to store information. In computers, external storage such as hard disk, disk, flash, optical disks, magnetic tapes, magnetic cards, etc. is used. External memory is sometimes called a data carrier. Unlike working memory, the information in these memories is not deleted when the computer is disconnected from the electrical network. Magnetic coating materials and other methods are used for long-term storage of information on the information carrier.

Xarici yaddaş qurğuları informasiyanın uzun müddət saxlanması üçün istifadə edilən qurğulardır. Bu qurğular informasiyanın saxlanması üçün enerjidən asılı deyil. Kompüterlərdə xarici yaddaş kimi sərt diskdən, diskdən, fləşdən, optiki disklərdən, maqnit lentlərindən, maqnit kartlarından və s. istifadə olunur. Xarici yaddaşa bəzən informasiya daşıyıcısı da deyilir. Əməli yaddaşdan fərqli olaraq bu yaddaşlardakı informasiya kompüter elektrik şəbəkəsindən ayrıldıqda silinmir. İnformasiya daşıyıcısında informasiyanın uzun müddət saxlanması üçün maqnit örtüklü materiallardan və digər üsullardan istifadə olunur. Böyük kompüterlərdə maqnit lenti və maqnit diski informasiya daşıyıcıları kimi geniş tətbiq edilir. Maqnit lentinə informasiya ardıcıl üsulla yazılır və oxunur.
Perfokartlar uzun müddət kompüter dünyasında verilənlərin saxlanılması üçün əsas qurğu olub. Perfokart latın sözüdür, perforo – dəlirəm, charta – papirus vərəqi, kağız deməkdir. Nazik kartondan hazırlanan perfokart informasiyanı kartın müəyyən mövqelərində dəliklərin olub-olmaması ilə təqdim edilir.



Şəkil 7.1.Perfokart ümumi görünüşü

IBM şirkəti 1949-cu ildə verilənlərin saxlanılması üçün yeni qurğu hazırlamağa başlayır və 1952-ci il may ayının 21-də IBM-701 seriyalı kompüterlər üçün IBM-726 lent daşıyıcı modulunu təqdim ediir.

1956-ci il sentyabr ayının 13-də ilk IBM şirkəti sərt diski (IBM 305) təqdim ediir. 1 tona (971 kq) yaxın çəkisi olan sərt disk ölçüsünə görə iri şkafı xatırladırdı. Perfokart və maqnit lentlərinin istifadə olunduğu bir dövrdə 5 milyon simvolu (5 MB) yaddaşda saxlayan sərt diskin yaradılması çox böyük nailiyyət idi. Sərt disk RAMAC (Random Access Method of Accounting and Control) adlanırdı və IBM-in San-Xose şəhərindəki laboratoriyasında hazırlanmışdı. Qiyməti 50 min dollar idi. 1 mbaytın qiyməti 10 min dollara bərabər idi. Sərt disk 35 min dollara (o dövrdə bu qiymət 17 minik avtomobilinin qiymətinə bərabər idi!) icarəyə verilirdi.

Şəkil 7.2.IBM-726 lent daşıyıcı

Şəkil 7.3. IBM 305 RAMAR sərt diski

Sərt disk daxilində 50 ədəd 24 düym (təxminən 61 sm) diametrə malik plastin yerləşirdi, oxuyan başlıq 1 ədəd olduğundan diskin işləmə surəti çox ləng idi. Yenə də Ronald Conson tərəfindən hazırlanmış digər modeldə isə (IBM 1301) hər 1 plastində ayrıca oxuyan başlıq var idi, bu da sərt diskin surətini artırırdı. Sərt disklər ölçüsünə görə (böyük yer tuturdu) bir çox illər daha çox elmi mərkəzlərin, iri şirkətlərin kompüter laboratoriyalarında istifadə olunub.

1980-cı ildə Seagate Technology ST- 506 – 5 MB yaddaşa malik ilk 5 düymlü sərt diski təqdim edir. Bundan sonra isə sərt disklər fərdi kompüterlərdə işlədilən əsas qurğulardan birinə çevrilib.

Sərt disklərin inkişafındakı naliyyətlər 1983-cü ildə original IBM XT kompüterində işlədilən sərt diskdə verilənlərin ötürülmə sürəti 100 Kbayt/s olub. Bu gün isə sərt disklərin əksəriyyəti Serial ATA interfeysi ilə işləyir. Bu interfeysdə verilənlərin ötürülmə sürəti xeyli artıb. Sərt maqnit disklərdə onların tutumu kimi, interfeysin sürəti də, həmçinin daim artır, hər şey isə MFM və RLL interfeyslərindən başlanıb. Onlar 1980-cı illərdə geniş yayılmışdılar. Hal-hazırda Parallel ATA (133 Mbayt/s-a qədər), Serial ATA (150 və ya 300 Mbayt/s), SAS (600 Mbayt/s-a qədər) və SCSI (320

Mbayt/s-a qədər) interfeysləri geniş yayılıb. İnterfeyslərin hamısı onları dəstəkləyən daşıyıcılardan daha sürətlidirlər. Bu, o deməkdir ki, verilənlərin ötürülmə sürəti interfeys tərəfindən deyil, həmişə daşıyıcı tərəfindən məhdudlaşdırılır.

Sərt disklərdə verilənlər oxuma/yazma başlıqları vasitəsilə oxunur və yazılır. Verilənlər lövhələrdə konsentrik çevrələr şəklində yazılır ki, bu da cığır adlanır. Hər bir cığır isə öz növbəsində sektordan ibarət olur.

Sərt diskdə adətən bir neçə lövhə (platters) olur və verilənlər onların hər 2 tərəfinə yazılır. Bir çox daşıyıcılarda 2 və ya 3 lövhə var, lakin 12 lövhəyə malik PC daşıyıcıları (Seagate Barracuda 180) da olur.

Tipik sərt disklərin əsas komponentləri aşağıdakılardır:

I Disk lövhələri;

I Oxuma/yazma başlıqları;

I Başlıqların mövqeyini dəyişən mexanizm; I Şpindel mühərriki;

I Elektron lövhə;

I Kabel və konnektorlar;

I Konfiqurasiya elementləri (məsələn, çeviricilər – jumpers).

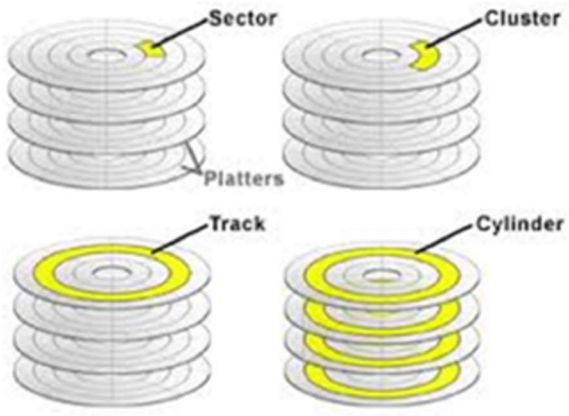
Sərt disklər üzərində məlumatlar sektor (sector) və cığır (track) adı verilən bölmələrdə saxlanılır. Məlumatlar bu sahələrə görə təşkil olunur. Sərt disk üzərində cığır və sektorların yerləşməsi aşağıdakı şəkildəb verilmişdir.

Sektorlar disk üzərində ünvanlaşdırıla bilən ən kiçik hissələrdir. 256 və ya 512 bayt kimi sabit genişliklərdə informasiya saxlayırlar. Əsasən 512 bayt olaraq istifadə edilir.

Aşağı səviyyəli formatlaşdırma (Low-Level formatting) ilə cığır və sektorlar təşkil olunur. Hər sektorun başlama və bitmə nöqtəsi diskdəki səthlər üzərinə yazılır. Yüksək səviyyəli formatlaşdırma (High-Level formatting) ilə sektorlarda Fayl Yerləşdirmə Cədvəli (File Allocation Table – FAT) yaradılır.

Format bölmələrin faylları və məlumatları saxlamaq üçün onları,əməliyyat sisteminin anlayacağı və istifadə edə biləcəyi şəkilə(formaya) salmasıdır.Çoxları format etməyi silmək kimi anlayır,amma bu əslində tam da belə deyil.Format fayl sistemini yaradıb,onun oturacağı kataloqu əmələ gətirir.Format məntiqi olaraq fayl depolama cərgəsini əmələ gətirir.Bu fayl sistemi adlanır.Bir çox fayl sistemləri vardır və bu sistemlərin məqsədi

disk üzərindəki faylların orqanizə etməkdir.Yəni Əməliyyat sisteminin disk üzərində faylların izlərini tapmaq üçün istifadə etdiyi bir üsuldur.Windowsa aid olan fayl sistemləri bunlardır. NTFS, FAT12, FAT16, FAT32, CDFS, UDF və s. -dir.



Şəkil 7.4. Sərt diskin məntiqi strukturu

FAT (File Allocation Table – Fayl Yerləşdirmə Cədvəli) – əsas fayl sistemlərindəndir. İllərdir MS-DOS əməliyyat sistemi ilə bərabər istifadə edilir. Hazırda da geniş olaraq Windows və digər əməliyyat sistemlərinin bazasında istifadə olunmaqdadır. Bu fayl sistemində fayl məlumatlarının əldə edilməsi üçün fayl yerləşdirmə cədvəlləri tutulur.

FAT fayl sistemi üç müxtəlif şəkildə təşkil olunur:
- FAT12 – 12 bit fayl sistemidir. Əsasən elastik disk və çox kiçik həcmli sərt disklərdə istifadə edilir;
- FAT16 – 16 bit fayl sistemidir. Əski DOS ilə uyğunluq təşkil edən əməliyyat sistemlərində istifadə edilir;
- FAT32 – hazırda da geniş olaraq istifadə edilən 32 bit fayl sistemidir.

HPFS (High Performance File System – Yüksək Məhsuldarlıqlı Fayl Sistemi) – OS/2 əməliyyat sistemi tərəfindən dəstəklənən və istifadə edilən bir fayl sistemidir. İlk çıxan NT əməliyyat sistemi də HPFS fayl sistemini istifadə edirdi. Əsas olaraq FAT ilə NT fayl sistemlərinin müəyyən xüsusiyyətlərini özündə birləşdirir. Bu fayl sistemində 256 simvola qədər fayl adı verilə bilər. Ayrıca 8 Gb-yə qədər sərt disk bölməsi təyin edilə bilər.

NTFS (New Technology File System – Yeni Fayl Sistemi Texnologiyası) – ilk olaraq Windows NT əməliyyat sistemi ilə istifadə edilən yeni və güclü bir fayl sistemidir. Etibarlılıq, sağlamlıq, daha geniş sahə istifadəsi, sıxışdırma, Macintosh dəstəyi, Netware dəstəyi kimi üstünlükləri səbəbilə çox yüksək səviyyəli bir fayl sistemidir. Hazırda Microsoft tərəfindən təkmilləşdirilən Windows əməliyyat sistemində əsas fayl sistemi olaraq istifadə edilir, eyni zamanda FAT16 və FAT32-ni də dəstəkləyir.

NTFS fayl sistemi fayl məlumatlarını təqib etmək üçün FAT fayl sistemində olduğu kimi bir fayl yerləşdirmə cədvəli tutmaz. Onun yerinə fayl məlumatlarını mənimsəyən və fayl bazasında icazələrin tutulduğu Master File Table adında cədvəl tutulur. Bundan başqa NTFS fayl pozulmalarında özü-özünü təmir edə bilən (repair) bir fayl sistemidir. Bu fayl sistemində də faylın adı 255 simvol uzunluğunda ola bilər, eyni zamanda nöqtə işarəsindən istifadə etməklə çox sayda fayl genişlənməsi verilə bilər.

FAT 32-nin əsas üstünlüyü sürətli olması və daha az yaddaş tələb etməsidir. Əgər sistem yalnız FAT 32-də çalışırsa, bu zaman NTFS üçün tələb olunan drayverlər və servislər yaddaşı yükləməyəcək. FAT 32-də çalışan diskin həcmi 8 TB qədər ola bilər. Bir faylın maksimum həcmi isə 4 Gb. FAT 32 fraqmentasiyaya daha meyllidir (xüsusilə disk 80% dolduqdan sonra). Bu da diskin işini əməlli çətinləşdirə bilər.

Üstünlükləri:
1. Operativ yaddaşa olan tələbatın azlığı.
2. Orta və kiçik həcmli fayllarla işin effektli olması.
3. Defraqmentasiyası üçün yaxşı utilitlərin olması.

Mənfikləri:
1. Sistem səhvlərindən müdafiənin zəifliyi.
2. Böyük həcmli disklərlə işin ləng olması.
3. Fraqmentasiya zamanı diskin işinin ləngiməsi.
4. Çoxlu fayl olan kataloqlarla zəif işləməsi.
5. Kiçik həcmli klasterləri dəstəkləməməsi.

NTFS-in üstünlüyü isə onun təhlükəsizliyidir. NTFS sistemi FAT 32-yə nisbətən daha gec dağılır. Məsələn, sistemdə bir neçə prosses fəaliyyətdə olarkən kompüterin sönməsi zamanı və s. bu kimi hallarda NTFS daha dözümlüdür və demək olar ki hər dəfə sistem səhvsiz bərpa oluna bilir. Həmçinin NTFS-in öz şifrələnmə sistemi var ki, bu da məlumatın saxlanmasında arxayınlıq yaradır.

Üstünlükləri:
1. Kiçik həcmli fayllarla işin sürətli olması.
2. Səhvlər zamanı sistemin rahatlıqla bərpa olunması.
3. Məlumatın effektli qorunması.
4. Böyük informasiya massivləri və kataloqlarla işin sürətli olması.
5. Klasterin həcmi çox kiçik təyin edilə bilər. Mənfilikləri:
1. Operativ yaddaşa tələbatın çox olması.
2. Sistem kiçik və sadə bölmələr üçün effektli deyil. (1 Gb- a qədər)
3. Klasterlərin doldurulması alqoritmi ideal deyil və fraqmentlənməklə nəticələnir.
4. Adi üsullarla (Windows-daxili imkanlarla) defraqmen- tasiyanın mümkünsüz olması.

Nəticədə görünür ki, hər iki sistemin mənfilikləri və müsbət cəhətləri var. Lakin, müasir kompüterə sahib olanlar üçün NTFS-in bir neçə mənfiliyini silmək olar. Demək, günümüzün kompüterinə sahib olan hər kəs, sisteminin təhlükəsizliyini təmin etmək üçün NTFS-dən istifadə edə bilər.
Əgər NTFS quraşdırmaq istəsəniz, onu təmiz diskə quraşdırın və ya vinçesteri birbaşa bu sistemdə formatlayın. FAT-da olan diski NTFS-ə çevirməyin. Bu faylların güclü fraqmentlənməsi ilə nəticələnir.

Elastik maqnit diskləri(FDD) Disket, (ing. Floppy disk, ing. diskette) kompüterdəki məlumatı daşımaq üçün istifadə edilən, üzərinə dəmir oksid örtülmüş bir plastik (elastik) diskin, plastik bir qab içərisinə yerləşdirilmiş maqnetik üsulla informasiya saxlama mühitinə malik qurğudur. Plastik diskin elastik olması səbəbiylə floppy adı verilir, floppi disk və ya disket kimi ifadə olunur.
Adətən kiçik ölçülərdəki faylların saxlanması və bir kompüterdən digərinə köçürülməsi üçün kompüterlərin oxucu qurğusuna (diskovod) yerləşdirilərək istifadə edilən val formasında maqnetik xüsusiyyətli bir vasitədir. Disketlərdən, kompüterin sistem bloku üzərində olan disket sürücü ilə informasiya mübadiləsi aparılır. Məlumatlar silinərək disket çindəki maqnetik yaddaş sahəsi təkrar-təkrar istifadə edilə bilər.
USB Driverlar çıxdıqdan sonra artıq Disket kompüterlərdə bir əhəmiyyəti qalmamışdır.
İlk disket, 1960-cı illərin sonunda ixtira edilib. İlk vaxtlar bir adı yoxidi. İlk disketin diametri 8 düym (200 mm) olmuşdur. 1960-ci illərin sonunda ixtira edilsə də disket ancaq 1971-ci ildə ticari olaraq istifadə edilməyə başlayıb. İlk kommersiya disketini IBM firması istehsal edib. Daha sonralar Memorex, Shugart Associates və Burroughs Corporation kimi şirkətlər disket istehsalçısı kimi tanınmağa başlayıb. Disket termini 1970-ci ildə istifadə edilməyə başlandı. 1980-ci illərdə disketlərə bir sıra yeniliklər gətirilib. Bir disket ən çox 5 düym ölçüyə malik idi.O vaxta qədər orijinal disketlər 8 düym diametrə malik idi və çox böyük idilər. 1990-cı illərə gəldikdə isə artıq disketlər 2 düym kiçilib 3 düym olmuşdular. Və disketlər ilk dəfə o zamanlar plastik materiallardan istehsal edilməyə başlandı.

Şəkil 7.5. 5,25-lik disketlər

Disketlər, fərqli ölçü və həcmlərə malikdirlər. Bir disketin fiziki ölşüsü bir kənarının düym olaraq uzunluğu ilə hesablanır. Son illərədək istifadəsi ən geniş yayılmış olan disket növü 3,5 düyümlük (3.5″) disketlər olmuşdur. Keçmişdə 5,25 düyümlük və 8 düyümlük olanları da istifadə edilmişdir.
Disketlər informasiya saxlama tutumuna görə də siniflərə bölünür. Disket tutumu sağ üst küncündə yazılan DD və HD hərflərindən istifadə edilərək fərqləndirilir. DD (Double Density) disketlər 720 KB, HD (Hight Density) disketlər 1,44 MB-lıq informasiya saxlama tutumuna malikdir.
Fərdi kompüterlərdə istifadə edilməkdə olan disket növləri aşağıdakı cədvəldə verilmişdir. Bunlardan başqa Amiga Kompüterləri DD Disketlərə 880 KB, HD Disketlərə də 1.76 MB informasiya yaz bilirlər.

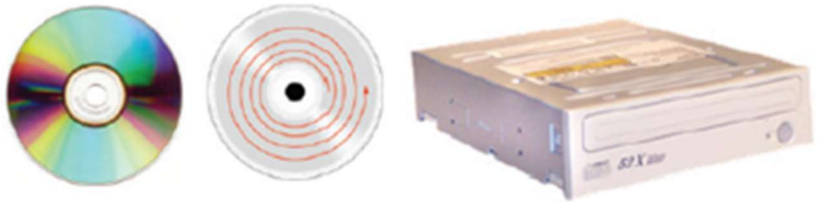
Disketlər, sabit disklərə oxşar olaraq cığır və sektorlardan ibarət olan materiallardır. Quruluşlarında səs və video kasetlərin də istifadə edilən lentə bənzəyən dairəvi bir lent istifadə edilir. Ancaq cığır və sektorlardan meydana gəlmələri səbəbindən göstəricilər səs və video kasetlərin də olduğu kimi zamanlı yazılmaz. Məsələn, faylın bir hissəsi 1 saylı sektorda yer alır və ikinci hissəsi 15 nömrəli sektorda yer alırsa, yazma/okuma başı 1den 15-ci sektora gedə bilər.

Şəkil 7.7. Diskovod

Disketlər üzərində oxuma və yazma əməliyyatı həyata keçirən qurğulara Floppy Disk yəni Disket Sürücü deyilir. İngiliscəsi Floppy Disk Drive olan bu Disket sürücülər günümüzdə çox istifadə olunmayan sürücülər olaraq qalmışdır.

CD-ROM

Bu tip yaddaşlarda informasiya daşıyıcısı CD (Compact Disk) və ya DVD-dir (Digital Versatile Disk). CD-ROM diametri 12 sm və qalınlığı 1,2 mm olan bir tərəfinə şəffaf lak qatı ilə zədələnmələrdən mühafizə edilən, işığı əks etdirən alüminium qatı tozlandırılmış şəffaf polimer diskdir. Tozlanmanın qalınlığı bir millimetrin bir neçə on mində bir hissəsini təşkil edir.



Şəkil 7.8. CD disk və CD ROM

Diskdəki informasiya diskin oxu yaxınlığındakı sahədən çıxan spiral trekdə yerləşən çuxurların (diskdəki dərinliklərin) və çıxıntıların (onların səviyyəsi diskin səthinə uyğun gəlir) ardıcıllığı şəklində təsvir edilir. Diskin radiusu üzrə hər bir düymdə (2,54 sm) spiral trekin 16 min sarğısı yerləşir. Müqayisə üçün sərt diskin səthində radius üzrə bir düymdə yalnız bir neçə yüz trek yerləşir. CD-nin tutumu 700 Mbayta çatır. İnformasiya diskə onun hazırlanması zamanı yazılır və dəyişdirilə bilməz.

CD-ROM yüksək xüsusi informasiya tutumuna malikdir ki. İnformasiya tutumuna görə bir CD təxminən 500 disketə bərabərdir. CD-ROM-dan informasiyanın oxunması kifayət qədər yüksək ancaq sərt diskdə olan yaddaş qurğularının iş sürətindən hiss olunacaq dərəcədə az sürətlə baş verir. CD- ROM-lar sadə və işdə rahatdırlar, verilənlərin saxlanmasının aşağı xüsusi xərcinə malikdirlər, praktiki olaraq aşınmırlar, viruslarla zədələnə bilməzlər, onlardan təsadüfən informasiyanı pozmaq mümkün deyil.

Maqnit disklərindən fərqli olaraq, kompakt-disk çoxlu dairəvi treklərə deyil, bir spiral trekə malikdir. Bununla əlaqədar olaraq, diskin bucaq fırlanma sürəti sabit deyil. Oxuyan lazer başlığın diskin kənarına irəliləməsi prosesində bucaq fırlanma sürəti xətti azalır.

CD-ROM-la işləmək üçün kompyuterə CD-ROM-un sət- hindəki dərinliklərin və çıxıntıların ardıcıllığını ikilik siqnallar ardıcıllığına çevirən CD-ROM yaddaş qurğusunu qoşmaq lazımdır. Bunun üçün mikrolazerli və işıq diodlu oxuyan başlıqdan istifadə edilir. Diskin səthində çuxurların dərinliyi lazer işıq dalğasının uzunluğunun dörddə birinə bərabərdir. Əgər informasiyanın oxunmasının iki ardığıl taktında lazer başlığının işıq şüası çıxıntıdan çuxurun dibinə və ya əksinə keçirsə, bu taktlarda işıq yollarının uzunluqları fərqi yarımdalğa qədər dəyişir ki, bu da işıq dioduna birgə düşən düz və diskdən əks olunan işığın güclənməsi və ya zəifləməsinə səbəb olur.

Əgər ardıcıl oxuma faktlarında işıq yolunun uzunluğu dəyişmirsə, onda işıq diodunun vəziyyəti də dəyişmir. Nəticədə işıq diodundan axan cərəyan trekdəki çuxurların və çıxıntıların kombinasiyasına uyğun olan ikilik elektrik siqnallarının ardıcıllığını əmələ gətirir.

İnformasiyanın iki ardıcıl oxuma taktında işıq şüasının optik yolunun müxtəlif uzunluğu ikilik vahidlərə uyğun gəlir. Eyni uzunluq ikilik sıfırlara uyğun gəlir.

Bu gün demək olar ki, bütün fərdi kompyuterlər CD-ROM yaddaş qurğusuna malikdir. Lakin bir çox multimedia interaktiv proqramları bir CD-yə yerləşmək üçün həddən artıq böyükdür. Bu halda DVD disklər tətbiq edilir. Bu disklər adi CD-lər kimi ölçüyə malikdirlər, lakin 4,7-e-17 Qbayta qədər verilənləri saxlayırlar, yəni həcminə görə 20 standart CD-ROM diskini əvəz edirlər. Belə disklərdə multimedia oyunlarını və videofilmləri saxlamaq mümkündür.

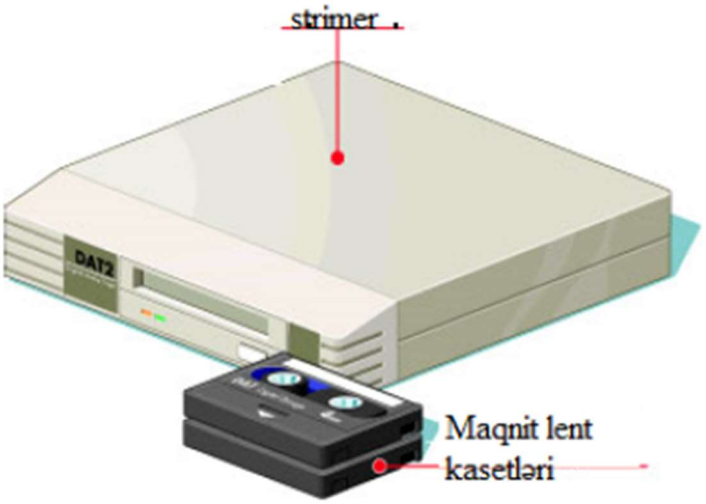
Yazan CD-R yaddaş qurğusu (Compact Disk Recordable) adi kompakt-diskləri oxumaqla yanaşı 700 Mbayt tutumlu optik disklərə informasiyanı yaza bilir. CD-R disklərində əks etdirici qat qızıl təbəqədən hazırlanmışdır. Bu qatla polikarbonat əsas arasında qızdırıldıqda qaralan üzvi materialdan olan qeyd edici qat yerləşir. Yazılma zamanı lazer şüası qatın seçilmiş nöqtələrini qızdırır. Bu nöqtələr qaralır və çuxurlara analoji olan sahələri əmələ gətirərək əks etdirici qata işıq buraxmağı dayandırır.

CD-RW maqnito-optik kompakt disklərində olan yaddaş qurğuları (şək. 2.10). CD- RW disklərindən dəfələrlə yazma üçün istifadə etmək olar. Tutumu 128 Mbaytdan 2,6 Qbayta qədərdir. DVD-RW yazan yaddaş qurğusu CD və DVD disklərini oxumaqla yanaşı onlara informasiyanı yaza da bilir. DVD-RW disklərindən dəfələrlə onlara informasiya yazmaq üçün istifadə etmək olar. Onların tutumu 4,7 Qbaytdan 17 Qbayta qədər dəyişir.

Fləş yaddaş(flash memory). Kompyuterlərdə və rəqəmsal qurğularda informasiya mübadiləsinin sürəti və verilənlərin saxlanılmasının böyük tutumu yaddaşın ən vacib xarakteristikalarıdır.

Fləş-yaddaş (USB Flash Drive) kompyuterin sərt disklərindən, disketlərdən, optik disklərdən prinsipial fərqlənir.
Sadalanan yaddaş qurğuların bir-neçə çatışmayan nöqsanı var. Bu ya zəif yazma/oxuma sürəti, ya da yaddaşın az tutumudur. Fləş-yaddaşdan oxunma və yazma sürəti əməli yaddaşla müqayisə oluna bilər, lakin əməli yaddaşdan fərqli olaraq o, kompyuterin sönülü vəziyyətində də məlumatları özündə saxlaya bilir.

Fləş-yaddaşın əsas parametrləri aşağıdakilardır:
yaddaşın tutumu (bir-neçə qiqabaytlarla ölçülür);
Verilənlərin oxuma sürəti. Bütün fləş-qurğular kompyuterə və ya digər rəqəmsal qurğulara USB port vasitəsi ilə birləşdirilir. Adətən, yazma sürəti 10 meqabayt/san, oxuma surəti isə 15 meqabayt/san təşkil edir.
Fləş-yaddaşın yeni bir növü U3-dür. Bu cür qurğular kompyuter tərəfindən 2 disk kimi tanınır. Birində verilənlər saxlanılır, digər diskdən isə proqram təminatını yükləmək olar, məsələn əməliyyat sistemini. U3 qurğunun üstünlüyü ondan ibarətdir ki, istənilən kompyuterdə bu qurğu vasitəsilə işləmək olar, və bu işdən sonra həmin kompyuterdə sizin işiniz haqqında heç bir əsər-əlamət qalmayacaq.
Fləş-yaddaş elektrik silinən və proqramlaşdırılan daimi yaddaş qurğusunun bir növüdür. Bu yaddaş elə təşkil olunub ki, hətta bir baytın yazılması üçün oxuma-silmə- yazma siklini həyata keçirmək lazım gəlir. Fləş-yaddaşın çatışmamazlığı ondan ibarətdir ki, yaddaş səhifələrin yenidən yazma sikllərin sayı təxminən 10000-dir. Yeni modellərdə bu rəqəmi bir milliona çatdırıblar.
Fləş-yaddaş qurğuların əksəriyyəti NAND ventillər əsasında təşkil olunur.
Maqnit lentlər .Strimer (stream – uzun lent) informasiyanı maqnit lentinə yazan xüsusi imkanlı maqnitafondur. Ondan sərt maqnit diskində olan informasiyanın ehtiyatda saxlanılması üçün istifadə edirlər. Əgər həddindən artıq vacib olan informasiya sərt maqnit diskindədirsə, onu strimmerdə saxlamaq məsləhət görülür. Strimerin kassetləri böyük tutuma (120 Mbaytdan 5 Hbayta qədər) malikdir.
Strimer (ingiliscə -tape, streamer) böyük həcmdə informasiyanın ehtiyat köçürülməsi üçün qurğudur. Daşıyıcı kimi burada 1¸2 Qbayt və daha çox tutumlu maqnit lentli kasetlər istifadə olunur.
Strimerlər maqnit lentli kiçik kasetə çox böyük miqdarda informasiya yazmağa imkan verir. Strimerin daxilində qurulmuş aparatla sıxma vasitələri yazılmadan əvvəl informasiyanı avtomatik sıxlaşdırmağa və oxunmadan sonra bərpa etməyə imkan verirlər ki, bu da saxlanılan informasiyanın həcmini artırır.



Şəkil 7.9. Strimmer və lent yaddaş qurğusu

Müasir strimerlərdə lent seqmentlərə bölünür. Seqmentlər nömrələnir. Seqmentlər bir-birinə paralel olan treklərdən ibarətdir. Hər bir trekə müraciət etmək mümkündür.
Strimerlərin çatışmazlığı onların informasiyanı nisbətən aşağı yazma, axtarma və oxuma sürətidir. Böyük tutumluq, etibarlılıq və iqtisadi səmərəlilik bu qurğunun istifadəsini çox faydalı edir.

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РОБОТОТЕХНИКАНЫҢ АВТОМАТТАНДЫРЫЛҒАН ӨНДІРІСТЕГІ ИНТЕГРАЦИЯСЫ

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Кіріспе

Робототехника — автоматтандыру, механика, электроника, және бағдарламалық қамтамасыз етуді қамтитын, машиналардың және автоматтандырылған жүйелердің жұмысын жобалау мен басқаруға арналған ғылым мен техника саласы. Оның негізгі мақсаты — адамдардың қол еңбегін алмастыра отырып, өндірістік процестерді тиімді және қауіпсіз жүргізу.

Бүгінгі күні робототехника өндірісте, медицинада, қызмет көрсету салаларында және күнделікті өмірде кеңінен қолданылады, бұл оның заманауи қоғамдағы маңыздылығын көрсетеді.

Автоматтандырылған өндіріс жүйелері — бұл өндірістік процестердің жоспарлау, басқару, бақылау және орындау этаптарын автоматтандыруды көздейтін кешенді жүйелер. Олар деректерді жинау, өңдеу және анализ жасау, сонымен қатар машиналардың және роботтардың қызметін үйлестіру арқылы жұмыс істейді. Автоматтандырылған өндірістің қажеттілігі өндірістің тиімділігін арттыру, өнім сапасын жоғарылату, шығындарды азайту және бәсекелестік қабілеттілікті қамтамасыз ету үшін туындады.

Робототехниканың автоматтандырылған өндірістегі интеграциясы жаңа технологияларды енгізудің негізінде тиімді және экологиялық таза өндіріс моделдерін қалыптастыруға мүмкіндік береді. Бұл өз кезегінде кәсіпорындардың өнімділігін арттырып, еңбек өнімділігін жоғарылатуға жағдай туғызады.

Робототехника түрлі салаларда қолданылатын әртүрлі робот түрлерін қамтиды. Олардың негізгі категориялары төмендегідей:

Индустриалды роботтар — өндірістік процестерді автоматтандыру үшін арнайы жасалған механикалық құрылғылар. Олар жинау, дәнекерлеу, бояу, пішіндеу, паллеттеу және басқа да операцияларды орындауға арналған. Индустриалды роботтар өндіріс процесінің жылдамдығын, дәлдігін және қауіпсіздігін арттыруға көмектеседі. Олардың басты артықшылықтары:

- Жоғары өнімділік: Индустриалды роботтар 24/7 режимінде жұмыс істей алады, бұл өндіріс қуатын арттырады.

- Дәлдік: Олар жоғары дәлдікпен және қайталанбалы операцияларды орындай алады, бұл өнімнің сапасын жақсартады.

- Адам қауіпсіздігін қамтамасыз ету: Қауіпті және физикалық ауыр жұмыстарды орындау үшін роботтарды пайдалану адамдардың жарақат алу қаупін азайтады.

Қызмет көрсету роботтары адам қызметін толықтыру немесе алмастыру мақсатында қолданылатын құрылғылар. Олар әр түрлі қызмет салаларында, мысалы, медицинада, білім беруде, логистикада, үй шаруашылығында және т.б. қолданылады. Қызмет көрсету роботтарының басты ерекшеліктері:

- Адаммен интерактивті байланыс: Олар адамдармен тікелей қарым-қатынас жасай алады, бұл клиенттермен қызмет көрсету сапасын арттырады.

- Көп функциялы: Қызмет көрсету роботтары әртүрлі міндеттерді орындауға бейімделген, мысалы, науқастарды күту, ақпарат беру, үй шаруашылығындағы жұмыстарды орындау.

Сериялық және параллельді роботтар — механикалық конструкциялардың жұмыс принципі мен конфигурациясына байланысты классификацияланған роботтар.

- Сериялық роботтар: Сериялық роботтардағы манипуляторлар бірнеше буындардан тұрады, олар тізбектеліп байланысқан. Бұл құрылғылар кең қозғалыс диапазонына ие, бірақ кейде динамикалық ауыртпалықты көтеру қабілеті төмен болуы мүмкін. Олардың қолданылу саласы — дәнекерлеу, бояу, жинау және т.б.

- Параллельді роботтар: Параллельді роботтар механикалық конструкциясы бойынша көптеген буындар мен қосылыстар арқылы параллельді түрде байланысқан. Бұл роботтар жоғары жүктемеге, динамикаға және дәлдікке ие. Олардың қолданысы — медициналық хирургия, авиация, автомобиль өндірісі және т.б.

Робототехниканың әртүрлі түрлері өндірісте, қызмет көрсету саласында және көптеген басқа салаларда тиімділікті арттыруға және адамдардың жұмысын жеңілдетуге мүмкіндік береді. Роботтардың интеграциясы болашақ өндіріс пен қызмет көрсету модельдерінің негізін қалайды, сонымен қатар қоғамның дамуына ықпал етеді. Робототехниканың автоматтандырылған өндірістегі интеграциясы қазіргі заманғы өндіріс жүйелерінің маңызды құрамдас бөлігіне айналды. Индустриалды роботтар, қызмет көрсету роботтары, сериялық және параллельді роботтар сияқты түрлі робот түрлерінің болуы өндіріс процестерін тиімдірек, жылдам әрі қауіпсіз жүргізуге мүмкіндік береді. Автоматтандырылған өндірісте робототехниканы қолдану адам еңбегін алмастыра отырып, өнімділікті арттырып, шығындарды азайтуға ықпал етеді. Бұл технологиялар өндірістің икемділігін жоғарылатады, сапаны қамтамасыз етеді, әрі нарықтың талаптарына жедел жауап беруге жағдай жасайды.

Сонымен қатар, робототехниканың дамуымен өндіріс процесі жетілдіріліп, жаңа мүмкіндіктер мен инновациялар туындайды. Болашақта робототехниканың интеграциясы адам мен машина арасындағы ынтымақтастықты нығайтып, қоғамды индустриализацияның жаңа деңгейіне көтеретіні сөзсіз. Сондықтан робототехниканың автоматтандырылған өндірістегі рөлін бағалағанда, оның тек өндіріс тиімділігін арттыру ғана емес, сонымен қатар еңбек нарығында жаңа жұмыс орындарын қалыптастыру, қауіпсіздік пен экологиялық таза өндірісті қамтамасыз ету сияқты аспектілерін де ескеру қажет.

Робототехниканың автоматтандырылған өндірістегі рөлі өте маңызды, себебі ол өндірістің барлық аспектілерін жақсартуға мүмкіндік береді. Оның негізгі бағыттары:

Робототехника өндіріс процестерін жоғары өнімділікпен жүзеге асыруға мүмкіндік береді. Индустриалды роботтар үздіксіз жұмыс істей алады, бұл өндіріс циклдарын жеделдетеді. Олардың жұмысының дәлдігі мен қайталанбалығы арқасында өнімнің сапасы артып, ақау деңгейі төмендейді. Роботтар өндіріс көлемін арттыруға және тапсырыстарды

уақытында орындауға мүмкіндік беріп, кәсіпорындардың бәсекелестік қабілетін жоғарылатады.

Робототехника автоматтандырылған өндірісте дәстүрлі өндірістік процестерді автоматтандыруға арналған. Бұл технологиялар өндірістік желілерде жұмыстың қауіпсіздігі мен жылдамдығын арттыруға, сондай-ақ адам ресурстарын тиімді пайдалануға мүмкіндік береді. Автоматтандыру өндіріс процесін бақылау және басқаруды жеңілдетеді, бұл деректерді жинау және анализ жасау арқылы өндірісті оңтайландыруға жол ашады. Сонымен қатар, автоматтандыру қателіктердің санын азайтып, еңбек жағдайларын жақсартуға ықпал етеді.

Робототехниканың басты артықшылықтарының бірі — адам еңбегін алмастыру. Роботтар физикалық ауыр жұмыстарды, монотонды тапсырмаларды, және қауіпті операцияларды орындауға қабілетті, бұл адамдардың денсаулығына қауіп төндірмейді. Адамдар шығармашылық және аналитикалық ойлауды талап ететін міндеттерге көбірек көңіл бөлетін болады. Бұл, өз кезегінде, еңбек өнімділігін арттырып, қызметкерлердің жұмыс сапасын жақсартады. Робототехниканың автоматтандырылған өндірісте рөлі өндіріс тиімділігін арттыру, процестерді автоматтандыру, және адам еңбегін алмастыру арқылы көрініс табады. Бұл технологиялардың интеграциясы заманауи кәсіпорындардың бәсекеге қабілеттілігін қамтамасыз етеді, өндіріс процестерінің жылдамдығы мен сапасын арттырады, сондай-ақ еңбек жағдайларын жақсартады. Робототехниканың дамуы мен кеңінен қолданылуы өндірістің болашағына үлкен әсер етеді.

Робототехниканың автоматтандырылған өндірістегі рөлі бүгінгі күні өндіріс саласының дамуында айрықша маңызға ие. Өндіріс тиімділігін арттыру, процестерді автоматтандыру, және адам еңбегін алмастыру — робототехниканың негізгі артықшылықтары. Бұл технологиялар кәсіпорындарға жоғары өнімділік пен сапаға қол жеткізуге, өндірістік циклдарды жеделдетуге, сондай-ақ еңбек қауіпсіздігін қамтамасыз етуге мүмкіндік береді.

Роботтар өндіріс процесінде адам еңбегін алмастыру арқылы адам ресурстарын тиімді пайдалануға жағдай жасап, адамдардың креативті тапсырмаларға көбірек көңіл бөлуіне мүмкіндік береді. Нәтижесінде, өндірісте жаңа жұмыс орындары пайда болып, еңбек өнімділігі мен тиімділігі артады. Сондай-ақ, автоматтандыру өндіріс жүйелерін басқаруды оңайлатып, деректерді жинау мен талдаудың тиімділігі арқылы өндірістің икемділігін арттырады. Осылайша, робототехниканың интеграциясы тек өндіріс процестерін жетілдіріп қана қоймай, сонымен қатар экономиканың тұрақты дамуына да үлес қосады. Келешекте робототехниканың дамуымен өндіріс саласында жаңа технологиялар мен инновациялар пайда болатыны сөзсіз. Бұл өз кезегінде кәсіпорындардың бәсекелестік қабілетін арттырып, әлемдік нарықта алдыңғы қатарлы орын алуына мүмкіндік береді.

Интеграция кезеңдері. Робототехниканы автоматтандырылған өндіріс жүйесіне интеграциялау бірнеше кезеңнен тұрады, олардың әрқайсысы жүйенің тиімді әрі қауіпсіз жұмыс істеуіне арналған. Бұл кезеңдер төмендегідей:

Интеграция процесінің алғашқы кезеңі — жоспарлау және дизайн. Бұл кезеңде өндірістік процестерді талдау жүргізіліп, қажетті роботтар мен автоматтандырылған жүйелердің талаптары анықталады.

- Талаптарды анықтау: Автоматтандыру қажеттілігі мен робототехниканың рөлін айқындау, сонымен қатар өндіріс мақсаттары мен стратегияларын белгілеу.

- Дизайн жасау: Жобалау кезеңінде жүйенің архитектурасы мен роботтардың конфигурациясы анықталады. Бұл кезеңде роботтардың жұмыс аймағы, құрал-жабдықтар, және процестің жалпы алгоритмі жобаланады.

- Кәсіпорынның ерекшеліктерін ескеру: Интеграция жоспарлары кәсіпорынның нақты жағдайларына, оның өндірістік ерекшеліктеріне және жұмыс күшіне негізделуі тиіс.

Екінші кезеңде роботтарды жұмысқа дайындау үшін оқыту мен программалау жүзеге асырылады.

- Роботтардың программалануы: Роботтардың жұмыс істейтін программалық қамтамасыз етуі мен алгоритмдері әзірленеді. Бұл кезеңде программалау тілдері мен платформалары таңдалып, роботтардың басқару жүйелері конфигурацияланады.

- Оқыту: Операторлар мен қызметкерлер роботтардың жұмыс істеу принциптерімен таныстырылады. Оқыту барысында олар роботтарды қалай басқару, техникалық қызмет көрсету, және мәселелерді шешу әдістерін үйренеді.

- Симуляциялар: Оқыту барысында симуляциялық бағдарламалар қолданылып, роботтардың жұмысын қауіпсіз жағдайда тексеру жүргізілед

Интеграцияның соңғы кезеңі — тестілеу және енгізу.

- Тестілеу: Жүйе жұмыс істей бастағаннан кейін, роботтардың жұмысы мен автоматтандырылған процестерді тестілеу жүргізіледі. Бұл кезеңде роботтардың функционалдығы, қауіпсіздігі және тиімділігі тексеріледі.

- Проблемаларды шешу: Тестілеу кезінде анықталған мәселелер мен ақаулар жойылады, қажетті түзетулер енгізіледі.

- Енгізу: Барлық тексерулер сәтті өткеннен кейін, роботтар мен автоматтандырылған жүйелер өндірістік процестерге енгізіледі. Бұл кезеңде жаңа жүйенің тиімділігі мен өнімділігі мониторингтеледі, қажетті коррекциялар мен оңтайландырулар жүзеге асырылады.

Робототехниканы автоматтандырылған өндіріс жүйесіне интеграциялау процесі жоспарлау және дизайн, оқыту мен программалау, тестілеу мен енгізу кезеңдерінен тұрады. Әрбір кезең өндірістің тиімділігін арттыруға, қауіпсіздігін қамтамасыз етуге және роботтардың жұмыс істеуін оңтайландыруға бағытталған. Интеграцияның сәтті жүзеге асырылуы кәсіпорынның өндірістік әлеуетін жоғарылатып, бәсекеге қабілеттілігін арттыруға септігін тигізеді.

Робототехниканы автоматтандырылған өндіріс жүйесіне интеграциялау — бұл кешенді және жүйелі процесс, үш негізгі кезеңнен: жоспарлау және дизайн, оқыту мен программалау, тестілеу мен енгізу тұрады. Әр кезеңнің өз ерекшеліктері мен маңызды міндеттері бар, оларды тиімді жүзеге асыру кәсіпорынның өнімділігі мен бәсекеге қабілеттілігін арттыруға мүмкіндік береді.

Жоспарлау кезеңінде өндірістік процестердің талаптары анықталып, робототехниканың дизайн концепциясы жасалады. Оқыту және программалау кезеңінде операторлар мен қызметкерлерге қажетті білім мен дағдылар беріліп, роботтардың бағдарламалық қамтамасыз етуі әзірленеді. Соңғы кезеңде тестілеу мен енгізу жүргізіліп, жаңа жүйенің тиімділігі мен қауіпсіздігі тексеріледі. Интеграцияның сәтті жүзеге асырылуы өндірістің барлық аспектілерін оңтайландырып, жұмыс күшінің қауіпсіздігін қамтамасыз етеді. Сонымен қатар, робототехника өндіріс процесін автоматтандыру арқылы еңбек өнімділігін арттырып, бизнес-стратегиялардың тиімділігін жоғарылатады.

Келешекте робототехниканың автоматтандырылған өндірісте рөлі одан әрі арта түседі, себебі заманауи өндіріс жүйелері инновацияларға, икемділікке және сапаға негізделеді. Интеграцияланған робототехникалық жүйелер кәсіпорындардың бәсекелестік қабілетін қамтамасыз етіп, тұрақты даму мен тиімділікке жол ашады.

Робототехниканың автоматтандырылған өндірістегі тиімділігі мен өнімділігін арттыру үшін қолданылатын түрлі технологиялық шешімдер мен әдістер бар. Олардың ішінде смарт фабрикалар, киберфизикалық жүйелер, және деректерді жинау мен талдау негізгі рөл атқарады. Смарт фабрикалар — бұл өндірістік процестердің автоматтандырылған, желілік

және интеграцияланған моделін білдіреді. Олар заманауи технологияларды, атап айтқанда, IoT (Интернет заттары), үлкен деректер, және жасанды интеллектті пайдаланады.

- Интеллектуалды жүйелер: Смарт фабрикаларда машиналар мен жабдықтар өзара байланысып, автоматты түрде шешімдер қабылдай алады. Бұл өнімділікті жоғарылатады және адам факторын минимизациялайды.

- Процестердің мониторингі: Жүйелер өндірістік процестердің жағдайын real-time режимінде бақылап, деректерді жинайды. Бұл оңтайландыруға және ресурстарды тиімді пайдалануға мүмкіндік береді.

- Икемділік: Смарт фабрикалар нарықтағы өзгерістерге жылдам жауап бере алады, бұл тапсырыстар мен өндіріс көлемін тез өзгертуге мүмкіндік тудырады.

Киберфизикалық жүйелер (КФЖ) — физикалық және кибернетикалық әлемдердің интеграциясын қамтамасыз ететін технологиялар. Олар сенсорлар, актюаторлар және деректерді өңдеу жүйелерінен тұрады.

- Деректерді өңдеу: КФЖ өндіріс процесінің физикалық компоненттерін қадағалап, олардан алынған деректерді өңдейді. Бұл ақпарат өндіріс жағдайын бақылауға және басқаруға мүмкіндік береді.

- Жоғары тиімділік: Киберфизикалық жүйелер өндірістегі тиімділікті арттыруға, ақауларды алдын ала болжауға және ресурстарды үнемдеуге жағдай жасайды.

- Интерактивтілік: Бұл жүйелер адам мен машина арасындағы өзара әрекеттестікті күшейтеді, адамдар мен роботтар арасында тиімді коммуникация орнатуға мүмкіндік береді.

Деректерді жинау және талдау — өндірістік процестердің тиімділігін арттыру үшін маңызды әдіс. Заманауи технологиялар деректерді нақты уақыт режимінде жинап, оларды талдауға мүмкіндік береді.

- Аналитикалық құралдар: Деректерді жинау үшін қолданылатын сенсорлар мен құрылғылар автоматты түрде ақпарат жинап, аналитикалық платформаларға жібереді. Бұл өндірістік процестерді басқару және талдау үшін негіз болып табылады.

- Шешім қабылдау: Деректерді талдау өндірістегі ақауларды, проблемаларды, және мүмкіндіктерді анықтауға көмектеседі. Осының арқасында, компаниялар өндірістік стратегияларын оңтайландыра алады.

- Болжау: Үлкен деректерді өңдеу мен талдау болашақтағы жағдайларды болжауға мүмкіндік береді, бұл ресурстарды тиімді пайдалануға және өндіріс көлемін жоспарлауға көмектеседі.

Смарт фабрикалар, киберфизикалық жүйелер, және деректерді жинау мен талдау автоматтандырылған өндірістегі негізгі технологиялық шешімдер болып табылады. Бұл шешімдер өндіріс тиімділігін арттырып, инновациялық әдістерді енгізуге мүмкіндік береді. Жаңа технологияларды қолдану кәсіпорындардың бәсекеге қабілеттілігін қамтамасыз етіп, тұрақты даму мен тиімділікті арттыруға бағытталған. Болашақта осы технологиялардың интеграциясы өндірістің тиімділігін одан әрі жоғарылатады.

Автоматтандырылған өндірістегі технологиялық шешімдер мен әдістер, атап айтқанда смарт фабрикалар, киберфизикалық жүйелер, және деректерді жинау мен талдау, өндіріс тиімділігін арттыру мен инновациялық мүмкіндіктерді ашуда маңызды рөл атқарады.

Смарт фабрикалар заманауи технологияларды интеграциялай отырып, өндіріс процестерінің автоматтандырылуын, икемділігін, және тиімділігін қамтамасыз етеді. Киберфизикалық жүйелер физикалық және кибернетикалық әлемдердің бірлесуін нығайтып, өндірістегі бақылау мен басқаруды жақсартады. Деректерді жинау мен талдау өндірістегі ақпараттың маңыздылығын арттырып, шешім қабылдаудағы дәлдік пен тиімділікті қамтамасыз етеді. Осы технологияларды интеграциялау автоматтандырылған өндіріс жүйесінің өнімділігін жоғарылатумен қатар, нарық талаптарына жедел жауап беруге,

ресурстарды тиімді пайдалануға және өндіріс жағдайларын оңтайландыруға мүмкіндік береді.

Келешекте робототехника мен автоматтандырудың дамуымен өндіріс саласы одан әрі жаңарып, кәсіпорындардың бәсекеге қабілеттілігі мен тұрақты дамуына үлкен ықпал ететін болады. Бұл, өз кезегінде, жаңа жұмыс орындарын құрып, экономикаға оң әсер ететін инновациялық шешімдердің пайда болуына ықпал етеді.

Робототехниканың болашағы заманауи технологиялардың қарқынды дамуына байланысты. Жасанды интеллектпен интеграция, нарықтағы трендтер, және еңбек нарығына әсері — осы саладағы маңызды аспектілер болып табылады. Робототехниканың болашағы жасанды интеллект (ЖИ) технологиясымен тығыз байланысты. ЖИ роботтарға деректерді өңдеу, үйрену және шешім қабылдау қабілетін береді.

- ✓ Адаптивтілік: ЖИ арқасында роботтар ортаға бейімделіп, жаңа жағдайларға жылдам жауап бере алады. Олар өткен тәжірибені пайдаланып, өз жұмысын жетілдіре алады
- ✓ Автономия: Жасанды интеллект роботтарға толық автономды режимде жұмыс істеуге мүмкіндік береді. Бұл өндірісте, логистикада және қызмет көрсету саласында тиімділікті арттырады
- ✓ Интеллектуалды шешімдер: ЖИ интеграциясы арқасында роботтар күрделі тапсырмаларды орындап, деректерді талдай алады, бұл өндірістің тиімділігін арттыруға мүмкіндік береді.

Робототехниканың дамуында бірнеше маңызды трендтер байқалады:

- ✓ Автоматизация: Кәсіпорындар автоматтандыруға көбірек назар аудара отырып, өндіріс процестерін тиімдірек жүзеге асыруға ұмтылады. Бұл тренд заманауи технологияларды қабылдауға және өнімділікті арттыруға мүмкіндік береді
- ✓ Сервистік роботтар: Қызмет көрсету саласында роботтардың қолданылуы өсуде. Роботтар клиенттермен өзара әрекеттесуге, көмек көрсетуге және қызметтерді автоматтандыруға арналған
- ✓ Киберфизикалық жүйелер: Нарықта киберфизикалық жүйелердің өсіп келе жатқан рөлі өндірістің цифрландыруын, мониторингін және басқаруын қамтамасыз етеді. Олар өндірістегі өнімділікті арттыруда маңызды рөл атқарады.

Робототехниканың дамуымен еңбек нарығында бірнеше өзгерістер байқалады:

- Жұмыс орындарының трансформациясы: Роботтардың пайда болуы кейбір дәстүрлі жұмыстарды автоматтандырады, бұл кейбір жұмыс орындарының жойылуына алып келеді. Дегенмен, жаңа технологиялар жаңа жұмыс орындарын да құрады.

- Дағдылардың өзгеруі: Еңбек нарығы жаңа дағдыларды талап етеді, атап айтқанда, робототехниканы басқару, бағдарламалау, және техникалық қызмет көрсету. Жұмысшылардың біліктілігін арттыру қажеттілігі туындайды.

- Қауіпсіздік: Робототехника өндірісте жұмыс істейтін қызметкерлердің қауіпсіздігін арттырып, қауіпті жұмыстарды автоматтандырады. Бұл жұмысшылардың денсаулығын сақтауға көмектеседі.

Робототехниканың болашағы жасанды интеллектпен интеграция, нарықтағы трендтер, және еңбек нарығына әсерімен тығыз байланысты. Бұл саладағы дамулар өндіріс тиімділігін арттырып, жаңа технологияларды енгізу арқылы экономиканың тұрақты дамуына ықпал етеді. Болашақта робототехниканың дамуы адам мен машинаның арасындағы қарым-қатынасты өзгертіп, жаңа мүмкіндіктер мен инновацияларды туындататыны сөзсіз.

Робототехниканың автоматтандырылған өндірістегі маңызы қазіргі заманғы өндіріс жүйелерінің тиімділігі мен икемділігін арттыруда ерекше рөл атқарады. Робототехника өндірістік процестерді автоматтандырып, адам еңбегін алмастыру арқылы өнімділікті жоғарылатуға, өндіріс уақытын қысқартуға, және қателіктерді азайтуға мүмкіндік береді.

Интеграцияланған жүйелер мен смарт фабрикалар өндіріс жағдайларын бақылап, ресурстарды тиімді пайдалануға, сондай-ақ, өнімнің сапасын арттыруға жағдай жасайды.

Робототехниканың болашақтағы даму бағыттары әртүрлі инновациялық технологиялармен, оның ішінде жасанды интеллект, машиналық оқыту, және киберфизикалық жүйелермен тығыз байланысты. Жасанды интеллекттің енгізілуі роботтардың автономды жұмыс істеу қабілетін күшейтіп, оларды күрделі тапсырмаларды орындауға мүмкіндік береді. Сонымен қатар, өндірістегі автоматизация деңгейінің артуы және сервистік роботтардың танымалдылығы еңбек нарығында жаңа дағдылар мен мамандықтарды талап етеді.

Болашақта робототехниканың дамуы өндірістік процестерді оңтайландыруға, өнімділікті арттыруға, және жаңа технологияларды енгізуге бағытталады. Бұл өз кезегінде кәсіпорындардың бәсекеге қабілеттілігін қамтамасыз етіп, экономиканың тұрақты дамуына үлес қосады. Инновациялардың дамуымен бірге, робототехниканың әртүрлі салаларда кеңінен қолданылуы өндіріс пен қызмет көрсету салаларын өзгертеді, жаңа мүмкіндіктер ашады.

Робототехниканың автоматтандырылған өндірістегі маңызы бүгінгі күні ерекше назарға алынуда. Бұл технологиялар өндіріс процестерін автоматтандыру арқылы тиімділікті, өнімділікті, және өнім сапасын арттыруға мүмкіндік береді. Роботтар еңбек күшінің жүктемесін жеңілдетіп, өндірістегі қауіпсіздікті қамтамасыз етеді. Сонымен қатар, олар өндіріс уақытын қысқартуға және адам факторынан туындайтын қателіктерді азайтуға септігін тигізеді.

Болашақтағы даму бағыттары робототехниканың интеграциялануымен, әсіресе жасанды интеллектпен және машиналық оқытумен тығыз байланысты. Бұл даму кезеңі роботтардың автономды жұмыс істеу қабілетін арттырып, олардың күрделі тапсырмаларды орындауына мүмкіндік береді. Сондай-ақ, автоматизация мен цифрландыру өндірістегі процестерді жеделдетуге, ресурстарды тиімді пайдалануға, және бизнестің икемділігін арттыруға мүмкіндік береді.

Келешекте робототехниканың дамуы өндіріс, қызмет көрсету, және логистика сияқты түрлі салаларда жаңа мүмкіндіктер ашады. Жаңа технологиялардың енгізілуі кәсіпорындардың бәсекеге қабілеттілігін қамтамасыз етіп, экономика мен қоғамдағы тұрақты дамуды қолдайды. Осылайша, робототехниканың болашағы жарқын болып, адамның және машинаның арасындағы қарым-қатынасты қайта қарауға мүмкіндік береді.

Робототехниканың автоматтандырылған өндірістегі маңызы қазіргі заманғы экономика мен технологиялық даму контекстінде өте зор. Роботтардың өндіріс процесіне енгізілуі өнімділікті арттырып, сапаны қамтамасыз етеді, сонымен қатар жұмысшылардың еңбек қауіпсіздігін күшейтеді. Автоматтандыру кәсіпорындарға нарықтағы өзгерістерге тез жауап беруге мүмкіндік беріп, ресурстарды тиімді пайдалануға жағдай жасайды.

Болашақта робототехниканың дамуы жасанды интеллект, машиналық оқыту, және киберфизикалық жүйелер сияқты инновациялық технологиялармен тығыз байланысты болады. Бұл интеграция роботтардың интеллектуалды функцияларын кеңейтіп, олардың автономды жұмыс істеу қабілетін арттырады. Сонымен қатар, жаңа технологиялардың енгізілуі еңбек нарығында жаңа дағдылар мен мамандықтарды талап етеді, бұл жұмыс күшінің біліктілігін арттыруға әкеледі.

Робототехниканың болашағы тек өндіріс саласында ғана емес, сондай-ақ, қызмет көрсету, логистика, және басқа да көптеген салаларда жаңа мүмкіндіктер туғызады. Осының нәтижесінде, бизнес пен қоғамның тиімділігі мен тұрақты дамуы артады. Жалпы, робототехниканың автоматтандырылған өндірістегі рөлі мен оның болашағы біздің өмірімізді оңтайландырып, технологиялық прогресті қамтамасыз етеді.

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КИБЕРФИЗИКАЛЫҚ ЖҮЙЕЛЕРДЕГІ ӨНДІРІС ПРОЦЕСТЕРІН БАСҚАРУ ӘДІСТЕРІ

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Кіріспе

Киберфизикалық жүйелер (КФЖ) — физикалық және кибернетикалық компоненттердің интеграциясынан тұратын заманауи технологиялық жүйелер. Олар ақпараттық технологияларды, датчиктер мен орындаушыларды, сондай-ақ коммуникациялық желілерді біріктіру арқылы нақты әлемдегі физикалық объектілер мен процестерді бақылап, басқаруға мүмкіндік береді. КФЖ-нің ерекшелігі — олардың деректерді жинау, талдау және автоматтандыру арқылы шешім қабылдау қабілеті. Бұл жүйелер өндірістен бастап, транспорт, медицина, энергетика және т.б. түрлі салаларда қолданылып, өндіріс процестерін тиімді басқаруға зор ықпал етеді.

Киберфизикалық жүйелердің өндіріске енгізілуі «Industry 4.0» концепциясымен тығыз байланысты, бұл концепция өндірісті автоматтандыру, цифрландыру және интеллектуалды шешімдер қабылдауға бағытталған. КФЖ өндіріс процесіндегі бақылау мен басқаруды жетілдіріп, ресурстарды тиімді пайдалану, шығындарды азайту, өнімділікті арттыру сияқты бірқатар артықшылықтар береді. Сонымен қатар, бұл жүйелер, деректерді реальды уақытта жинау мен талдау арқылы, өндірістегі проблемаларды алдын ала анықтап, тиімді шешімдер қабылдауға мүмкіндік жасайды.

Дегенмен, киберфизикалық жүйелердің енгізілуі бірқатар қиындықтар мен қауіптерді де туындатады. Мәселен, киберқауіпсіздік мәселелері, технологиялық тәуелділік, жүйелердің интеграциясындағы қиындықтар өндіріс процесінің тұрақтылығына әсер етуі мүмкін. Сондықтан, киберфизикалық жүйелердің тиімділігін арттыру үшін олардың басқару әдістерін зерделеу, проблемаларды анықтау және оларды шешу жолдарын қарастыру аса маңызды.

Осы баяндаманың мақсаты — киберфизикалық жүйелердегі өндіріс процестерін басқару әдістерін жан-жақты зерттеу. Бұл зерттеу барысында киберфизикалық жүйелердің құрылымына, олардың өндірістегі рөліне, қолданылатын басқару әдістеріне, сондай-ақ заманауи тенденциялар мен практикалық мысалдарға назар аударылады. Нәтижесінде, киберфизикалық жүйелердің өндіріс процесіндегі орны мен маңызын анықтап, болашақтағы даму перспективасын қарастыру көзделеді.

Киберфизикалық жүйелер (КФЖ) — физикалық және кибернетикалық компоненттердің тығыз интеграциясына негізделген, нақты уақыт режимінде деректерді жинап, өңдеп, физикалық процестерді бақылауға және басқаруға мүмкіндік беретін

технологиялық жүйелер. Олар компьютерлік жүйелер мен физикалық объектілердің бірігуінен туындайтын кешенді құрылымдар болып табылады, яғни кибернетикалық (ақпараттық) және физикалық (реалды) әлемнің арасындағы өзара әрекеттестікті қамтамасыз етеді.

КФЖ-нің негізгі ерекшеліктері мыналар:

- ✓ Интеграция: КФЖ физикалық компоненттер (датчиктер, орындаушылар, машиналар) мен ақпараттық компоненттер (деректер өңдеу, алгоритмдер, бағдарламалық қамтамасыз ету) арасында тығыз байланыс орнатады. Бұл жүйе шынайы уақытта ақпарат жинауға, өңдеуге және әрекет жасауға мүмкіндік береді.
- ✓ Автоматтандыру: КФЖ автоматты түрде шешімдер қабылдап, физикалық процестерді басқаруға қабілетті. Бұл, әсіресе, өндірісте, транспортта және басқа да салаларда тиімділікті арттыруға септігін тигізеді
- ✓ Деректердің реальды уақыты: КФЖ нақты уақытта деректер жинап, өңдей алады, бұл жүйелерге жағдайды үнемі бақылауға және өзгерістерге жедел жауап беруге мүмкіндік береді.
- ✓ Коммуникация: Киберфизикалық жүйелер желілік технологияларды қолдана отырып, компоненттер арасында ақпарат алмасу мүмкіндігін қамтамасыз етеді. Бұл компоненттердің бір-бірімен байланысын нығайтып, интеграцияланған басқару шешімдерін жүзеге асыруға мүмкіндік береді.
- ✓ Динамикалық адаптация: КФЖ физикалық орта мен жүйенің қажеттіліктеріне сәйкес динамикалық түрде бейімделе алады. Бұл жүйелердің тиімділігі мен тұрақтылығын арттырады.

Киберфизикалық жүйелер қазіргі заманғы өндіріс, логистика, энергия, денсаулық сақтау және тағы басқа көптеген салаларда қолданылып, өндіріс процесінің тиімділігін, қауіпсіздігін және сенімділігін арттыруға ықпал етеді.

Киберфизикалық жүйелер (КФЖ) қазіргі заманғы өндіріс саласының негізгі қозғаушы күшіне айналды. Олардың өндіріс процесіндегі рөлі автоматтандыру, тиімділікті арттыру, деректерді нақты уақыт режимінде жинау және өңдеу арқылы көрінеді. КФЖ өндірістік операциялардың интеграцияланған басқарылуын қамтамасыз етіп, ресурстарды тиімді пайдалануға, шығындарды азайтуға және өнімділікті арттыруға мүмкіндік береді.

Киберфизикалық жүйелердің енгізілуі өндірістегі инновацияларды ынталандырады, гибридтік өндірістік модельдерді қалыптастыруға мүмкіндік береді, сондай-ақ өнімнің сапасын бақылау және қауіпсіздікті қамтамасыз етуге ықпал етеді. Сонымен қатар, КФЖ-нің пайдалануымен өндірістік процестердегі киберқауіпсіздік мәселелерін шешу, операциялардың үздіксіздігін қамтамасыз ету және нарықтағы бәсекеге қабілеттілікті арттыру мүмкіндігі жоғарылайды.

Бүгінгі таңда киберфизикалық жүйелер тек өндіріс саласында ғана емес, сонымен қатар логистика, энергетика, денсаулық сақтау және тағы басқа салаларда да кеңінен қолданылып, кәсіпорындардың операциялық тиімділігін арттыруда маңызды рөл атқаруда. Сондықтан, киберфизикалық жүйелердің потенциалын толық іске асыру және олардың даму трендтерін бақылау, заманауи экономикада табысты болудың кілті болып табылады.

Осылайша, киберфизикалық жүйелерді енгізу мен дамыту өндіріс процесін тиімді басқарудың, ресурстарды оңтайлы пайдаланудың және нарықтық сұранысқа жауап берудің маңызды құралдары болып табылады. КФЖ-нің дамуы мен жетілдірілуі болашақта өнеркәсіптік революцияның жаңа кезеңдерін қалыптастыруға, әлемдік экономиканың тұрақты дамуына және инновациялық шешімдердің енгізілуіне ықпал етеді.

Киберфизикалық жүйелер (КФЖ) қазіргі заманғы өндірістің дамуы мен трансформациясында маңызды рөл атқарады. Олар өндіріс процесін автоматтандыру, оңтайландыру және тиімді басқаруға арналған шешімдер ұсынып, кәсіпорындардың

бәсекеге қабілеттілігін арттыруға мүмкіндік береді. КФЖ-нің өндірістегі рөлі бірнеше негізгі аспектілерде көрінеді:

Автоматтандыру және оңтайландыру:

- ✓ Киберфизикалық жүйелер өндіріс процестерін автоматтандыруға мүмкіндік береді. Датчиктер мен орындаушылардың интеграциясы арқасында, өнімділік пен сапаны бақылау, өндіріс желілерін басқару автоматты түрде жүзеге асырылады
- ✓ КФЖ процестерді оңтайландыруды қамтамасыз етіп, ресурстарды тиімді пайдалануға, жұмыс уақытын қысқартуға және шығындарды азайтуға ықпал етеді.

Нақты уақыттағы бақылау:

- ✓ КФЖ нақты уақытта деректерді жинап, өңдейді, бұл өндірістегі өзгерістерді жедел бақылауға және басқаруға мүмкіндік береді. Мысалы, өндіріс желісіндегі ақауларды немесе жетіспеушіліктерді жылдам анықтау және шешу, процесс барысында тиімділікті арттыру үшін өте маңызды.

Деректер аналитикасы:

- ✓ Киберфизикалық жүйелер өндіріс процесінде үлкен деректерді жинап, оларды аналитикалық құралдармен өңдеуге мүмкіндік береді. Бұл, өз кезегінде, трендтерді болжау, өнімділікті арттыру, сапаны қамтамасыз ету және нарықтық сұранысқа жауап беру сияқты шешімдер қабылдауға негіз болады.

Интеграцияланған басқару: КФЖ өндірістік процестерді интеграцияланған басқаруға мүмкіндік береді. Бұл жүйелер әртүрлі өндірістік бөлімшелер мен компоненттердің бірлесіп жұмыс істеуін қамтамасыз етіп, кәсіпорынның жалпы тиімділігін арттырады.

Гибридтік модельдер: Киберфизикалық жүйелер физикалық және виртуалды әлемдерді біріктіріп, гибридтік өндірістік модельдерді құруға мүмкіндік береді. Бұл модельдер өндірісті цифрландыру, смарт фабрикалар мен өнеркәсіптік интернеттің (IIoT) негізінде жұмыс істейді.

Тиімді логистика және тасымалдау: КФЖ-нің логистикадағы қолданылуы материалдардың қозғалысын оңтайландырып, тасымалдау және сақтау процестерін автоматтандыруға ықпал етеді. Бұл, өз кезегінде, жеткізу мерзімдерін қысқартып, шығындарды азайтады.

Қауіпсіздік және сенімділік: Киберфизикалық жүйелер өндіріс процестерінің қауіпсіздігін қамтамасыз ету үшін заманауи киберқауіпсіздік технологияларын қолданады. Бұл кәсіпорындарды сыртқы қауіптерден қорғауға және өндірістің үздіксіз жұмысын қамтамасыз етуге мүмкіндік береді.

Инновацияларды енгізу:

- КФЖ инновациялық технологияларды енгізу үшін платформалар ұсынады, бұл кәсіпорындардың жаңа өнімдер мен қызметтерді дамытуына, нарықтағы бәсекеге қабілеттілігін арттыруына септігін тигізеді.

Киберфизикалық жүйелер өндіріс процесінде автоматтандыру, деректерді нақты уақыт режимінде өңдеу, интеграцияланған басқару, гибридтік модельдерді құру, қауіпсіздік пен сенімділік сияқты көптеген маңызды аспектілерде рөл атқарады. Бұл технологиялар өндірістің тиімділігін арттырып, кәсіпорындардың бәсекеге қабілеттілігін және нарықтағы орнының нығаюын қамтамасыз етеді.

Киберфизикалық жүйелер (КФЖ) физикалық және кибернетикалық компоненттердің интеграциясынан тұратын кешенді жүйелер. Олардың құрылымы бірнеше негізгі элементтерден тұрады, әрқайсысы жүйенің тиімді және сенімді жұмыс істеуіне ықпал етеді. КФЖ-нің құрылымы мыналарды қамтиды:

Физикалық компоненттер:

- Датчиктер: Физикалық ортадан (температура, қысым, жылдамдық, т.б.) ақпарат жинайтын құрылғылар. Датчиктер жүйенің "сезім мүшелері" ретінде әрекет етіп, нақты уақыт режимінде деректерді қамтамасыз етеді.

- Орындаушылар: Деректерді өңдеу нәтижесінде алынған командаларды жүзеге асыратын механизмдер. Олар физикалық объектілерді басқару (мәселен, моторлар, клапандар) үшін қолданылады.

- Құрылғылар мен машиналар: Өндіріс процестерінде пайдаланылатын құрал-жабдықтар, мысалы, роботтар, автоматтандырылған өндірістік желілер және т.б.

Кибернетикалық Компоненттер:

- Контроллерлер: Деректерді жинап, өңдейтін және басқару алгоритмдерін жүзеге асыратын процессорлар. Контроллерлер киберфизикалық жүйенің "миы" ретінде жұмыс істейді, олар датчиктерден келген деректерді талдайды және орындаушыларға командалар жібереді.

- Бағдарламалық қамтамасыз ету: Жүйенің жұмысын басқаруға, деректерді өңдеуге және әрекеттерді автоматтандыруға арналған бағдарламалар. Бағдарламалық қамтамасыз ету аналитикалық құралдар, алгоритмдер мен интерфейстерден тұрады.

Ақпараттық жүйелер:

- Деректер базасы: Жүйедегі жинақталған ақпараттарды сақтау және өңдеу үшін пайдаланылатын құрылым. Деректер базасы өндіріс процесінің барлық аспектілерін (сапа, өнім, жабдық) бақылауға мүмкіндік береді.

- Комуникациялық желілер: Датчиктер, контроллерлер мен орындаушылар арасында ақпарат алмасуды қамтамасыз ететін байланыс арналары. Бұл желілер Wi-Fi, Ethernet, Zigbee, Bluetooth және т.б. технологияларды пайдаланады.

Интерфейстер:

- Пайдаланушы интерфейсі: Жүйенің пайдаланушымен (операторлар, инженерлер) байланысын қамтамасыз ететін визуалды немесе командалық интерфейс. Пайдаланушы интерфейсі ақпаратты көрсету, басқару командаларын енгізу және жүйенің күйін бақылау үшін қолданылады.

- API (Application Programming Interface): Жүйе компоненттері арасындағы байланыс пен өзара әрекеттестікті қамтамасыз ететін интерфейстер. API арқылы бағдарламалық қамтамасыз ету мен аппараттық құралдар арасында ақпарат алмасу жүзеге асырылады.

Деректерді анализдеу және басқару:

- Аналитикалық құралдар: Жинақталған деректерді талдау, модельдеу және болжам жасау үшін пайдаланылатын бағдарламалар. Бұл құралдар деректерді визуализациялауға, тенденцияларды анықтауға және өндіріс процесін оңтайландыруға көмектеседі.

- Басқару алгоритмдері: Физикалық жүйелердің динамикасын, өнімнің сапасын және ресурс тұтынуды бақылау үшін қолданылатын математикалық модельдер мен алгоритмдер.

Киберфизикалық жүйелердің құрылымы олардың жұмыс істеуінің негізі болып табылады. Физикалық компоненттер мен кибернетикалық компоненттердің интеграциясы, ақпараттық жүйелер мен интерфейстердің үйлесімі киберфизикалық жүйелерді тиімді, сенімді және автоматтандырылған басқаруға мүмкіндік береді. Бұл құрылым өндірістің тиімділігін, өнімнің сапасын және ресурстарды пайдалануды оңтайландыру үшін маңызды.

Киберфизикалық жүйелердің құрылымы олардың күрделі және үйлестірілген жұмысын қамтамасыз етеді. Физикалық компоненттер (датчиктер, орындаушылар, құрылғылар) мен кибернетикалық элементтердің (контроллерлер, бағдарламалық қамтамасыз ету) үйлесуі жүйенің нақты уақыт режимінде тиімді жұмыс істеуіне мүмкіндік береді. Ақпараттық жүйелер деректерді жинақтап, талдауға көмектессе, коммуникациялық желілер мен интерфейстер компоненттер арасындағы үздіксіз ақпарат алмасуды қамтамасыз етеді.

КФЖ-нің құрылымын дұрыс ұйымдастыру өндірістегі процестерді автоматтандыруға, сапаны бақылауды жетілдіруге, ресурстарды үнемдеуге және шығындарды азайтуға мүмкіндік береді. Бұл жүйелер өндіріс процесінің барлық сатыларын бақылап, басқаруға, сондай-ақ қажетті шешімдерді жедел қабылдауға ықпал етеді. Осылайша, киберфизикалық жүйелер қазіргі заманғы өндіріс пен технологиялық процестерді жақсартуда маңызды рөл атқарады және болашақтағы технологиялық дамудың негізін қалайды.

Өндіріс процестерін тиімді басқару ұйымның жалпы тиімділігін, өнімділігін және бәсекеге қабілеттілігін арттырады. Негізгі басқару әдістері өнімділік пен ресурстарды пайдалануды оңтайландырып, сапаны бақылауға және уақытты үнемдеуге көмектеседі. Төменде өндіріс процестерін басқарудың кең таралған және тиімді әдістері қарастырылады.

Lean Production әдісі өндірістік процестерден барлық артық элементтерді жойып, тек қажетті элементтерді қалдыруға бағытталған. Бұл әдіс төмендегі қағидаларға негізделеді:

- ✓ Артық шығындарды жою: Қорларды тиімді пайдаланбайтын артық шығындарды жою
- ✓ Тұрақты жақсарту (Kaizen): Өндіріс процесін үздіксіз жақсарту үшін қызметкерлерден ұсыныстар алу
- ✓ Құндылық ағындарын талдау: Өндіріс процесіндегі әр кезеңді құндылыққа қосқан үлесі бойынша бағалау.

Өндіріс процестерін басқарудың әртүрлі әдістері өндірістік кәсіпорындарға әртүрлі мақсаттар мен жағдайларға байланысты қолданылады. Lean Production, Six Sigma, TQM, JIT, TOC және APCS секілді әдістер ресурстарды тиімді пайдаланып, сапаны жақсартуға, шығындарды азайтуға және тұтынушылардың қажеттіліктерін қанағаттандыруға көмектеседі. Кәсіпорынның қажеттілігіне сәйкес осы әдістерді дұрыс таңдап, оларды енгізу кәсіпорынның тиімділігі мен бәсекеге қабілеттілігін арттыруда маңызды рөл атқарады.

Деректерді жинау және өңдеу кез келген саланың тиімді жұмыс істеуі мен дұрыс шешім қабылдауы үшін маңызды рөл атқарады. Бұл процестер нақты уақыттағы ақпаратты талдап, қажетті өзгерістерді жылдам енгізуге мүмкіндік береді. Бүгінгі таңда өндірістен бастап денсаулық сақтау мен қаржы секторына дейін деректерге негізделген шешім қабылдау кеңінен таралған. Деректерді жинау — қажетті ақпаратты көздерден алуға бағытталған процесс. Бұл ақпарат неғұрлым сапалы әрі дәл болса, оны пайдалану арқылы жасалатын шешім де соғұрлым дұрыс болады. Деректерді жинау келесі тәсілдер арқылы жүзеге асады:

- ✓ Өнеркәсіпте, көлікте, құрылыс пен денсаулық сақтау салаларында кеңінен қолданылады. Мысалы, өндірістік жабдықтардың жағдайын бақылау үшін температура, қысым, ылғалдылық сияқты параметрлерді өлшейтін датчиктер орнатылады.
- ✓ Тұтынушылардың, қызметкерлердің немесе клиенттердің қажеттіліктерін, қалауларын және көзқарастарын білу үшін қолданылады. Әсіресе маркетинг және әлеуметтік зерттеулерде жиі пайдаланылады.
- ✓ Ұйым ішіндегі бұрынғы құжаттар, есептер және басқа жазбаларды саралау арқылы ақпарат алу мүмкіндігі бар.
- ✓ Интернет, әлеуметтік желілер мен жаңалықтар веб-сайттары, сондай-ақ ашық дереккөздерден алынатын ақпарат, әсіресе нарық трендтері мен бәсекелестердің жағдайын талдау үшін маңызды.
- ✓ Кәсіпорындарда ERP (кәсіпорын ресурстарын басқару жүйесі), CRM (клиенттермен қарым-қатынас басқару жүйесі) және өндірісті басқару жүйелері арқылы деректер жинақталады. Бұл жүйелер деректерді нақты уақытта жинап, өндіріс процестерінің тиімділігін арттыруға мүмкіндік береді.

Деректерді өңдеу — жинақталған ақпаратты талдау және шешім қабылдау үшін қажетті пішінге келтіру процесі. Деректерді тиімді өңдеу жүйені оңтайландыруға, сапалы өнім шығаруға және ұйымның жұмысын жақсартуға мүмкіндік береді. Деректерді өңдеу келесі

сатылардан тұрады. Деректерді талдаудан алынған ақпарат негізінде стратегиялық және тактикалық шешімдер қабылданады. Мысалы, өндірісте өндіріс көлемін өзгерту, ресурстарды бөлу немесе жабдықтарды жаңарту туралы шешімдер қабылдануы мүмкін.

Деректерді жинау және өңдеу ұйымның стратегиялық шешімдер қабылдауы мен тиімділігін арттыруда маңызды рөл атқарады. Деректерді дәл және жүйелі жинау, оларды өңдеу, талдау және визуализациялау процестерінің нәтижесінде ұйым өз жұмысын оңтайландыра алады, нарықтағы өзгерістерге жылдам бейімделіп, бәсекеге қабілеттілігін арттырады.

Прогноздық аналитика мен машиналық оқыту — қазіргі заманғы технологиялар арқылы деректерді талдау мен болжауды жақсарту саласында үлкен рөл атқаратын құралдар. Бұл әдістер шешім қабылдаудағы тиімділікті арттырып, ұйымдардың нарықтық өзгерістерге жылдам бейімделуіне және үрдістерді алдын ала болжауға мүмкіндік береді. Прогноздық аналитика — өткен деректер мен ағымдағы үрдістер негізінде болашақтағы оқиғаларды немесе нәтижелерді болжауға бағытталған әдіс. Бұл аналитика түрі математикалық модельдер, статистикалық талдау және машиналық оқыту алгоритмдері негізінде жүзеге асады.

Машиналық оқыту (Machine Learning) — компьютерлерге адам араласуынсыз өз бетімен үйренуге мүмкіндік беретін жасанды интеллект бағыты. Машиналық оқыту әдістері деректерге негізделген алгоритмдерді қолдана отырып, бұрынғы ақпаратты талдап, жаңа ақпаратты өңдеуде шешім қабылдай алады.

Прогноздық аналитика мен машиналық оқыту қазіргі заманғы бизнесте бәсекелестік артықшылыққа ие болуға мүмкіндік береді. Бұл технологиялар арқылы ұйымдар деректерге негізделген нақты шешімдер қабылдап, өз тиімділігін арттыра алады. Алдағы уақытта бұл әдістердің мүмкіндіктері артып, жаңа салаларда қолдану аясы кеңейе береді. Прогноздық аналитика және машиналық оқыту қазіргі заманғы ұйымдардың тиімді шешім қабылдауы, тәуекелдерді азайтуы және ұзақ мерзімді стратегияларды құруы үшін аса маңызды құралдар болып табылады. Бұл технологиялар үлкен көлемдегі деректерді талдауға және болашақтағы тенденцияларды дәл болжауға мүмкіндік береді. Нәтижесінде, өндірістік, қаржылық, медициналық және басқа да көптеген салаларда компаниялар өз ресурстарын тиімді пайдаланып, нарықтағы бәсекелестерінен алда болуға мүмкіндік алады. Машиналық оқыту әдістері арқылы ұйымдар мәліметтерді дәлірек талдай алады, ал прогноздық аналитика ұйымдарға ұзақ мерзімді болжау мүмкіндігін береді. Бұл құралдар бірігіп, ұйымдарға нақты және уақытылы шешім қабылдауға, тұтынушылардың талаптарын жылдам түсінуге және өзгерістерге икемді бейімделуге жағдай жасайды.

Болашақта бұл технологиялар деректерді талдау әдістерін жетілдіріп қана қоймай, жасанды интеллект дамуы арқылы экономиканың әртүрлі салаларында қолдану аясын кеңейтуге мүмкіндік береді. Осылайша, прогноздық аналитика мен машиналық оқыту технологиялары ұйымдардың нарықтық бәсекелестікке дайын болуын қамтамасыз ететін стратегиялық құралдар қатарынан өз орнын алады.

Блокчейн — деректердің қауіпсіздігі мен айқындылығын қамтамасыз ететін заманауи технология, ол әрбір транзакцияны ретті тізбек ретінде сақтауға мүмкіндік береді. Бұл технология деректердің өзгертусіз сақталуына, үшінші тараптың араласуынсыз қауіпсіз транзакциялар жасауға жағдай жасайды. Қолдану аясы қаржы саласынан бастап денсаулық сақтау, логистика, мемлекеттік басқару және білім беру салаларына дейін кеңейіп келеді. Блокчейн бастапқыда криптовалюта жүйелері үшін жасалынғанымен, бүгінгі таңда қаржы секторында көптеген қызметтерді жақсарту үшін қолданылады:

- ✓ Төлем жүйелері: Банк және төлем қызметтері блокчейн арқылы арада делдалсыз, тез және арзан төлемдер жүргізеді

- ✓ Кредит беру: Смарт-келісімшарттар арқылы блокчейнде кепілдендірілген несие беру және төлем кепілдіктерін орнату мүмкіндігі бар
- ✓ Қаржылық қауіпсіздік: Транзакциялар мен деректерді өзгертуге болмайтындықтан, алаяқтықтың алдын алуға көмектеседі.

Логистика және жабдықтау саласында блокчейн арқылы тауардың бастапқы көзінен соңғы тұтынушыға дейінгі қозғалысын бақылауға болады:

- ✓ Тауардың шығу тегі мен сапасын бақылау: Блокчейн арқылы тауардың қай жерден шыққанын, қандай аралықтарды өткенін білуге болады.
- ✓ Транспаренттілік: Әрбір транзакция ашық әрі сенімді болғандықтан, тауардың сапасына кепілдік беру оңайырақ.

Денсаулық сақтау жүйесінде науқастардың деректерін қауіпсіз сақтау, басқару және оны қажетті мамандарға ұсыну мүмкіндігін жақсартады:

- ✓ Медициналық деректердің қауіпсіздігі**: Блокчейн арқылы әрбір науқастың медициналық тарихын бірегей және өзгермейтін түрде сақтауға болады
- ✓ Дәрі-дәрмек қадағалау: Контрафакт дәрілердің таралуының алдын алып, дәрі-дәрмектің шынайы шығу тегін анықтауға көмектеседі.

Блокчейн арқылы білім беру саласында студенттердің жетістіктерін, сертификаттарын және оқу үлгерімін сақтау мүмкіндігі артады:

- ✓ Сертификаттардың өзгермейтіндігі: Студенттердің дипломдары мен сертификаттарын блокчейнде сақтай отырып, олардың өзгеріссіз қалуына және жұмыс берушілердің тексере алуына мүмкіндік береді
- ✓ Академиялық жетістіктерді бақылау: Блокчейн арқылы әрбір студенттің академиялық үлгерімін тіркеу және бақылау оңай.

Блокчейн технологиясы әртүрлі салаларда ақпарат қауіпсіздігін қамтамасыз етіп, процестерді автоматтандыруға мүмкіндік береді. Бұл технологияның болашағы зор, өйткені ол қолдану салаларына қарай кеңейіп, цифрлық экономиканы дамытуға жаңа мүмкіндіктер береді.

Киберфизикалық жүйелер (КФЖ) өндіріс процестерін басқарудағы жаңа кезең болып табылады. КФЖ арқылы өндіріс процестері цифрлық және физикалық әлемдер арасындағы нақты уақыттағы байланысты қамтамасыз етеді, бұл жүйелердің тиімділігін арттырып, шығындарды азайтуға және өнім сапасын жақсартуға мүмкіндік береді. Өндірісті басқаруда КФЖ қолдану келесі артықшылықтарды береді:

1.Процестердің нақты уақыттағы мониторингі: КФЖ сенсорлар, датчиктер және цифрлық платформалар арқылы жабдықтардың жағдайын, жұмыс қарқынын бақылауға мүмкіндік береді, бұл өндірістік ақаулардың алдын алуға жағдай жасайды.

2. Автоматтандыру және роботтандыру: Өндіріс процесінде КФЖ-ді қолдану адам еңбегін азайтып, автоматтандырылған шешімдер қабылдауға мүмкіндік береді, бұл өз кезегінде тиімділікті арттырып, жұмыс өнімділігін көбейтеді.

3. Деректер негізінде шешім қабылдау: КФЖ өндірістен жиналған үлкен көлемдегі деректерді өңдеуге және сол негізде шешім қабылдауға мүмкіндік береді. Бұл өндірістік процестің барлық кезеңдерінде дәлдік пен тиімділікті қамтамасыз етеді.

4. Жабдықтардың қызмет көрсету уақытының ұзақтығын арттыру: КФЖ арқылы жабдықтардың техникалық қызмет көрсетілуін алдын ала жоспарлап, оларды тоқтаусыз пайдалану мүмкіндігі артады.

Қорытындылай келе, киберфизикалық жүйелерді қолдану өндірістік процестердің тиімділігін арттырып қана қоймай, өндірістік компанияларға нарықтағы бәсекелестік қабілеттерін жоғарылатуға және цифрлық экономикаға бейімделуге көмектеседі. Алдағы

уақытта КФЖ дамуы инновациялық өндіріс модельдерінің дамуына ықпал ететіні анық, сондықтан бұл технологияны енгізу маңызды стратегиялық бағыт болып қала бермек.

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ТЕХНОЛОГИЯ ПОВЫШЕНИЯ УСТОЙЧИВОСТИ КРОВЛИ КАМЕР В РУДНИКАХ

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Аннотация: Данная статья рассматривает инновационные технологии, направленные на повышение устойчивости кровли камер в условиях горнодобывающих рудников. Особое внимание уделяется методам обеспечения безопасности и повышения эффективности работы в рудниках. Представлены результаты исследований, а также практические аспекты внедрения предложенной технологии. В статье рассмотрено развитие экологически устойчивых материалов и методов строительства кровельных систем, которое поможет снизить отрицательное воздействие на природную среду. Приведены факты для улучшения работ, автоматизация горнодобывающих операций, включая укрепление и ремонт кровельных систем, с использованием роботов и дронов. Показана важность интеграции современных разработок для обеспечения безопасности, эффективности и устойчивости в условиях горной деятельности.

Ключевые слова: Технология, горнодобывающие предприятия, устойчивость кровли камер, безопасность, эффективность, инновации, рудники.

Введение

В условиях горнодобывающих предприятий, вопросы безопасности и эффективности являются первостепенными. Одним из ключевых аспектов обеспечения безопасности в рудниках является повышение устойчивости кровли камер. Эта статья посвящена рассмотрению современных технологий, направленных на улучшение структуры и устойчивости кровельных систем в рудниках.

Горнодобывающие работы связаны с множеством рисков, включая обрушения и подземные аварии. Устойчивость кровли камер играет важную роль в предотвращении данных происшествий. Инновационные технологии, разработанные для повышения устойчивости, не только способствуют безопасности труда горняков, но и повышают эффективность добычи полезных ископаемых. Использование специальных материалов с

уникальными физическими и механическими свойствами становится ключевым аспектом в повышении устойчивости кровельных конструкций. Прочные и легкие композитные материалы, устойчивые к воздействию влаги и химических веществ, позволяют создавать кровли с долгим сроком службы и минимальными рисками обрушений. Технологии 3D-моделирования позволяют проводить детальные анализы структуры кровли камер, предвосхищая возможные проблемы и оптимизируя ее конструкцию. Это помогает выявить слабые места и предпринимать меры по укреплению до начала добычи. Установка датчиков и систем мониторинга позволяет в режиме реального времени отслеживать состояние кровли камер. [1,78с] Это не только обеспечивает своевременное обнаружение потенциальных проблем, но также предоставляет данные для анализа и последующего улучшения технологий. Применение искусственного интеллекта для анализа данных и прогнозирования возможных угроз становится все более актуальным. Алгоритмы машинного обучения могут обрабатывать большие объемы информации, предоставляя ценные рекомендации для оптимизации устойчивости кровельных систем. Применение вышеупомянутых технологий в реальных условиях рудников продемонстрировало значительное улучшение в обеспечении безопасности труда и повышении эффективности. Проактивное использование 3D-моделирования и анализа данных от датчиков позволяет предупреждать возможные проблемы и реагировать до возникновения критических ситуаций. С постоянным развитием технологий можно ожидать появление новых методов и решений для повышения устойчивости кровель камер в рудниках. Исследования в области наноматериалов, дальнейшее совершенствование систем мониторинга и внедрение более сложных алгоритмов искусственного интеллекта откроют новые горизонты для безопасной и эффективной горной деятельности. [2,205с]

Методика исследования

Современные технологии, направленные на повышение устойчивости кровельных систем в рудниках, не только улучшают безопасность и эффективность, но также создают основу для будущего развития горнодобывающей промышленности. С учетом непрерывного технологического прогресса можно выделить несколько перспективных направлений: Внедрение технологий, сфокусированных на минимизации экологического воздействия горнодобывающих операций, становится приоритетом. Развитие экологически устойчивых материалов и методов строительства кровельных систем поможет снизить отрицательное воздействие на природную среду. Автоматизация горнодобывающих операций, включая укрепление и ремонт кровельных систем, с использованием роботов и дронов обещает увеличить безопасность и эффективность работ в труднодоступных зонах. Это также сократит риск для человека при выполнении подобных задач. Внедрение сетей "Интернета вещей" для мониторинга и управления состоянием кровельных систем позволит осуществлять удаленный контроль и оперативно реагировать на потенциальные угрозы. [3,23с] Это сделает процессы обслуживания более эффективными и даст возможность предотвращать проблемы на ранних этапах. Применение искусственного интеллекта для анализа данных об эксплуатации кровельных систем позволит создавать более точные модели предсказания, адаптированные к уникальным условиям каждого рудника. Это снизит вероятность человеческого фактора и повысит эффективность профилактических мероприятий.

Моделирование устойчивости пролета камер. Обоснование допустимого пролета камер расчетами, должен быть обусловлена выбором физической модели физического процесса обрушения кровли, которая соответствует горно-геологическим условиям рудника Жомарт. Основанием для этого служат наблюдаемые на практике закономерности обрушений кровли: – при раскоске камер и оформлении первых МКЦ кровля, закрепленная

анкерами, отслаивается от вышележащих пород и зависает на анкерах. Появляется множество разрывных трещин. Возникает необходимость в их принудительном обрушении. Часто наблюдаются отслоения пород между анкерами мощностью 0,1÷0,3 м. На участках кровли, не закрепленных торкретбетоном, видны разрывные трещины длиной до 1,5÷2,0 м с шириной раскрытия до 0,5 см; – в большинстве камер в призабойной зоне после отбойки руды в первые часы после своего обнажения происходит разрушение нижнего слоя пород кровли и оголение анкеров до 0,5 м; – в центрах сопряжения очистных камер в местах максимального прогиба кровли, нередко наблюдаются разрывные трещины, смятие и обрыв опорных плит анкерной крепи; наблюдения, проведенные с помощью видеозонда ТАИС, показали раскрытие трещин по межпластовым горизонтальным контактам на глубине от 1,9 м до 2,4 м от контура кровли. – после оформления 2÷3 рядов МКЦ состояние кровли, как правило, улучшается: уменьшается количество оголившихся анкеров и объем перекрепления. Однако, как и при нарезных работах, появляются консоли (отслоения) на анкерах. Наблюдаются, но в меньшей степени, разрывные трещины, проходящие в основном по оси камер; – после обрушений кровли мощностью больше длины анкеров контур зоны обрушения приобретает характерный вид трапеции с плоским верхним основанием (рисунок 1).

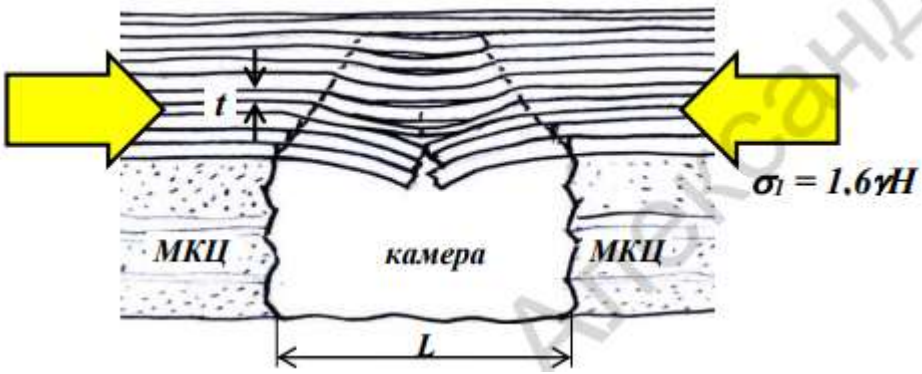

Рисунок 1 – Характерная форма обрушений кровли очистных камер

Если представить кровлю очистных камер в виде пакета тонких слоев перемежающихся пород мощностью 0,1÷0,3 м, сжатых тектоническими напряжениями, тогда данные закономерности обрушений (отслоений) кровли камер соответствуют потери устойчивости от продольного сжатия горизонтальными напряжениями по Л. Эйлеру. Именно по данной схеме необходимо вести расчет допустимых пролетов кровли камер. Чтобы подтвердить выбор расчетной схемы, проведено численное моделирование поведения тонкоплитчатой кровли. На основании результатов исследований механических свойств руды и пород, природного напряженного состояния массива, структуры и трещиноватости массива, а также анализа составлена расчетная схема для численного моделирования устойчивости тонкослоистой кровли очистных камер, закрепленной анкерами длиной 2,4 метра по сетке 1×1 м, при наличии в массиве тектонических напряжений. Моделирование проведено с помощью программы «RS2» (RocScience, Canada). По блочной модели частота трещин (Fracture Frequency - FF) в кровле залежи 4-1 изменяется в пределах FF = 2÷10. В большой части поля рудника Жомарт 2 частота трещин составляет FF = 4÷5. Это соответствует расстоянию между трещинами (толщине слоев) t = 1/FF = 0,20÷0,25 м. Более высокая частота трещин ожидается только в зонах тектонических разломов. Для дальнейших расчетов примем, что распределение расстояний между трещинами (Spacing) подчиняется обратному экспоненциальному закону со средним значением 0,2 м и диапазоном изменения от 0,1 м до 0,3 м. Это соответствует толщине t моделируемых слоев пород в кровле. Исходные данные для компьютерного моделирования показано на таблице 1.

Название материала	Вес единицы	Соотношение Пуассона	Модуль Янга	Критерий неудачи	Пик угла трения	Пик сплоченности
Горные породы	0.027	0.2	4700	Мор кулон	35	8.7

Таблица 1 – Исходные данные для численного моделирования

Моделирование проводилось для глубины разработки 430 метров. Природное напряженное состояние массива принято гравитационным (вертикальные напряжения равны γH) с коэффициентом бокового давления λ = 1,6. Упругие свойства массива тонкоплитчатой кровли заданы модулем деформации Ем = 4,7 ГПа и коэффициентом Пуассона ν = 0,2; прочностные свойства – сцеплением в массиве См = 8,7 МПа и углом внутреннего трения ϕ = 35°. На рисунке 13 показана зона неупругих деформации (ЗНД) вокруг камеры шириной 9,0 метров. По результатам численного анализа видно, что ЗНД по кровле достигает 2,36-2,55 м.

На рисунке 2 показан результаты моделирования по определению общего смещения тонкослоистой кровли камеры шириной 9 м, которая составляет около 10 см в середине пролета.

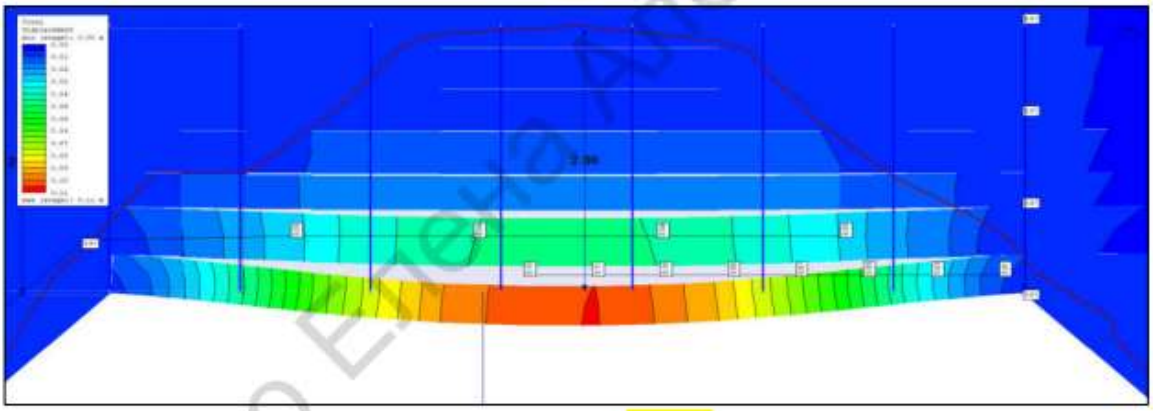

Рисунок 2 – Прогиб тонкослоистой кровли камеры шириной 9 м, закрепленной анкерами с шагом 1×1 м на глубину 2,4 м.

Расчетный прогиб кровли камер в середине пролета достигает 10 см. Это по порядку величины соответствует результатам натурных наблюдений Аманжолова Э.А. с помощью датчиков смещений. Также моделирование показывает расслоение кровли за счет разницы в смещениях разных слоев. Расслоения кровли также были зафиксированы в скважинах, пробуренных в кровлю, с помощью видеозонда ТАИС. Данные факты свидетельствуют о сходимости результатов расчета с проявлениями горного давления, наблюдаемыми на практике. Это говорит о достоверности расчетной модели.

На рисунке 3 показано распределение максимальных напряжении (Sigma1) вокруг камеры. Видно, что при 1,6γH отработке камер зона концентрации напряжения в кровле выработки и могут достигать до 34 Мпа, тогда как в зоне разгрузки напряжения (борта камеры) Sigma 1 около 10 Мпа.

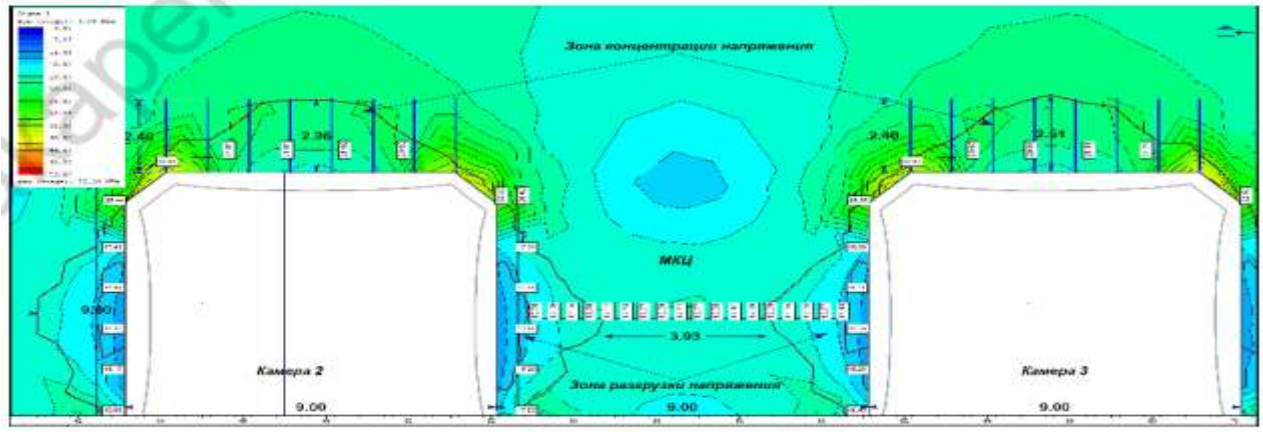

Рисунок 3 - Зона концентрации Sigma 1 при ширине камеры 9 м.

Далее был выполнен численный анализ с изменением. Чтобы оценить влияние пролета камер на устойчивость кровли, проведено численное моделирование с шириной камер 8,0 м и 7,0 м. На рисунок 4 показано распределение запаса прочности в кровле камеры шириной 8 м. Уменьшение пролета камеры на 1 м (с 9 м до 8 м) снижает прогиб кровли в 2 раза (до 5 см). Также значительно снижается глубина разрушений в кровле – до 1,75 м. Анкерная крепь длиной 2,4 м все же не способна удержать тонкослоистую кровлю на таком пролете. Однако, нагрузка на МКЦ уменьшилась, то есть, при ширине камеры 8,0 метров МКЦ не разрушается.

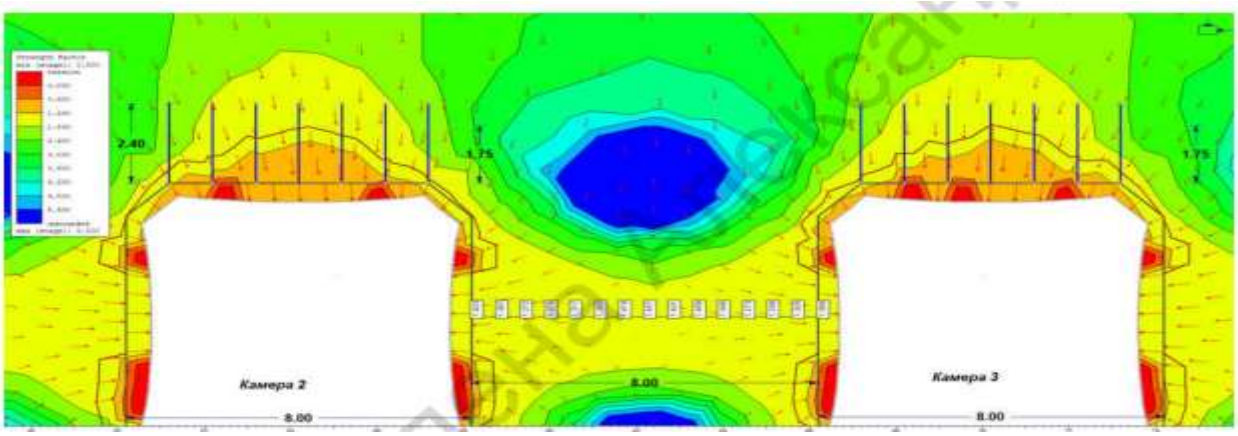

Рисунок 4 – Разрушение (оранжевым цветом) тонкослоистой кровли камеры шириной 8 м, закрепленной анкерами с шагом 1×1 м на глубину 2,4 м.

Уменьшение пролета камеры еще на 1 м (с 8 м до 7 м) снижает прогиб кровли до 2 см. Также значительно снижается глубина разрушений в кровле – до 1,33 м. В данном случае анкерная крепь длиной 2,4 м способна удержать тонкослоистую кровлю на таком пролете, в среднем запас прочности (Strength Factor) МКЦ равен 1,35, что обеспечивает сохранность целика. Таким образом можно сделать вывод о том что, обеспечения устойчивости кровли камер достигается только снижением его пролетов.

Результаты

В Швеции активно внедряются технологии 3D-моделирования для анализа и оптимизации структуры кровельных систем в горнодобывающих рудниках. Исследования направлены на создание интеллектуальных моделей, способных предсказывать потенциальные проблемы и предоставлять рекомендации по укреплению. В Австралии акцент делается на использовании робототехники для ремонта и обслуживания кровельных систем в рудниках. Дроны и автоматизированные роботы позволяют проводить работы в

труднодоступных местах, снижая риск для работников. Китай активно инвестирует в исследования наноматериалов для создания более прочных и легких составных материалов, используемых в кровельных системах. Также страна внедряет системы мониторинга на базе "Интернета вещей" для удаленного контроля и оперативного реагирования. В Канаде находят применение технологии искусственного интеллекта для анализа данных о работе кровельных систем. Алгоритмы машинного обучения позволяют создавать предсказательные модели, учитывающие уникальные условия канадских рудников. В Южной Африке активно развиваются технологии в области экологической устойчивости. Использование экологически чистых материалов и методов строительства кровельных систем становится важным аспектом, учитывая влияние горнодобывающей деятельности на природную среду. В Норвегии уделяется внимание использованию интеллектуальных систем мониторинга, которые в реальном времени анализируют данные о состоянии кровельных систем. Это позволяет оперативно реагировать на любые отклонения и снижает риск возникновения аварийных ситуаций. Бразилия активно применяет технологии наноматериалов для усиления кровельных конструкций. Исследования в этой области направлены на создание материалов, обеспечивающих оптимальное сочетание прочности и легкости для устойчивости в условиях горнодобывающих операций. В США внимание уделяется развитию экологически устойчивых технологий для горнодобывающих предприятий. Это включает в себя использование солнечных и ветровых источников энергии для снижения воздействия на окружающую среду в процессе производства материалов и строительства. Россия внедряет технологии искусственного интеллекта для создания адаптивных систем управления кровельными системами. Это позволяет реагировать на изменения в окружающей среде и условиях работы рудника, обеспечивая надежность и безопасность. Общей тенденцией является стремление стран к комплексному подходу, интегрируя технологии для оптимизации структуры кровельных систем в горнодобывающих рудниках. Это свидетельствует о глобальной ориентации на современные решения в области безопасности труда, эффективности производства и соблюдения экологических стандартов. [4,112с]

В Казахстане стремление к современным технологиям в горнодобывающей отрасли подчеркивает стратегический подход к обеспечению безопасности и эффективности. Интеграция инновационных решений в повышении устойчивости кровли камер в рудниках становится неотъемлемой частью стратегии развития горнодобывающего сектора Казахстана. Казахстан активно внедряет технологии искусственного интеллекта для оптимизации управления кровельными системами. Алгоритмы машинного обучения анализируют данные о состоянии конструкций, что позволяет предсказывать потенциальные проблемы и предпринимать проактивные меры. В Казахстане также акцент делается на использовании экологически устойчивых материалов в горнодобывающей отрасли. Развитие технологий, направленных на снижение воздействия на окружающую среду, становится важным аспектом стратегии устойчивого развития. Казахстан активно развивает сотрудничество с мировыми инновационными компаниями, чтобы обеспечить доступ к передовым технологиям в горнодобывающей отрасли. Это включает в себя внедрение передовых систем мониторинга, разработку интеллектуальных материалов и применение современных методов анализа данных. Создание центров исследований и инноваций в Казахстане направлено на разработку собственных технологических решений, специализированных под условия местных рудников. Это способствует адаптации мировых инноваций к уникальным особенностям горнодобывающего сектора Казахстана. Казахстан уделяет внимание подготовке квалифицированных кадров, способных эффективно внедрять и использовать новые технологии. Обучение персонала по современным стандартам и инновационным методам становится важным элементом успешной интеграции технологий

в горнодобывающей отрасли. Интеграция современных технологий в горнодобывающую промышленность Казахстана подчеркивает стремление страны к лидерству в области инноваций в сфере добычи полезных ископаемых. С постоянным развитием технологических решений и поддержкой со стороны государства, Казахстан открывает новые перспективы для устойчивого, безопасного и эффективного горнодобывающего сектора, способного справляться с вызовами будущего. [5.257с]

Выводы

Подводя итог, технологии повышения устойчивости кровли камер в рудниках становятся неотъемлемой частью горнодобывающей промышленности по всему миру. Примеры из разных стран подчеркивают важность интеграции современных разработок для обеспечения безопасности, эффективности и устойчивости в условиях горной деятельности. Глобальные усилия в этой области способствуют формированию будущего, где горнодобывающая промышленность станет более устойчивой, продуктивной и безопасной.

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TEXNOLOJİ BACARIQLARIN RƏQƏMSAL TƏHSİL FORMATININ İNKİŞAFINA TƏSİRİ

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Qloballaşan dünyada digər sahələr kimi təhsil sahəsinə inteqrasiya etmiş dijital texnologiyalardan istifadə zərurəti təhsilverənlərdən yenilənmiş texnoloji bacarıqlara yiyələnmək vərdişləri tələb edir. Son illər təhsil sisteminin keyfiyyətinin yaxşılaşdırılması üçün: fənn kurrikulumlarının yenilənməsi, müəllim fəaliyyətinin modernləşdirilməsi, dərs prosesinin və məktəb infrastrukturunun yaxşılaşdırılmasına yönəlmiş bir sıra təhsil islahatları həyata keçirilir. Bu islahatlar nəticəsində, beynəlxalq səviyyədə təhsil sahəsində də nailiyyətlər qazanılmışdır.

THE IMPACT OF TECHNOLOGICAL SKILLS ON THE DEVELOPMENT OF DIGITAL EDUCATION FORMAT

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Summary

In the globalized world, the need to use digital technologies integrated into the field of education, like other fields, requires educators to acquire updated technological skills. In recent years, a number of educational reforms have been implemented aimed at improving the quality of the education system: updating subject curricula, modernizing teacher activity, improving the teaching process and school infrastructure. As a result of these reforms, achievements have been made in the field of education at the international level.

Açar sözlər: rəqəmsal cəmiyyət, riyazi təhsil, tədris prosesi
Keywords: digital society, mathematical education, educational process

Giriş

Qarşıya qoyulmuş təhsil islahatları həm ölkəmizdə, həm də inkişaf etmiş digər ölkələrdə ən yaxşı göstəricilərə malik təhsilverən və təhsilalanların yetişməsi ilə nəticələnmişdir. Lakin bəzi məktəb sistemlərində mövcud olan yüksək akademik və sosial-iqtisadi strategiyalarda mövcud vəziyyətin yenilənməsinə ehtiyac vardır. Bütün sahələrdə olduğu bu sahədə müzakirələr həm işin xeyrinə, həm də qarışıq və ziddiyyətli fikirlərə səbəb olur. Çünki bəzi hallarda rəqəmsal texnologiyalara əlçatanlıq ilə malik olduşumuz imkanlar arasında ziddiyyətlər yaranır. Bəzən isə müsbət və ya aşırı istifadəyə rast gəlinir. Tədqiqatlar göstərir ki, uşaqların və gənclərin internetdən, texnologiyalardan, virtual oyunlardan həddən artıq istifadəsi çox vaxt sosial narahatlıqla əlaqəli bir sıra risklərlə əlaqəli olur. Bunlara misal olaraq, kiber zorakılıq, təhlükəli cinsi davranışlar və psixoloji patologiyaları göstərmək olar. Bütün bunların uşaqların akademik performanslarına təsiri müxtəlif faktlarla təsdiqlənmişdir. Bunun üçün ailə və məktəb işbirliyinə, mənəvi dəyərlərin öyrədilməsində önəm verilməlidir. Bu yolda müxtəlif təlim metodlarından, kreativ öyrənmə və öyrətmə üsullarından da faydalanmaq olar. İstənilən yaşda Montessori metodunun, STEAM təhsil formatının prinsiplərindən istifadə edərək təhsilalanlarda sərbəst kəşf etmə, özünə inam, müstəqillik, yaradıcılıq, xəyal qurmaq bacarığı və intizam inkişaf etdirilə bilər. Montessori təhsilinin

diqqət mərkəzində uşaqdır. Montessori təhsili uşaqlara öz tempi və üslubunda öyrənməyə imkan verir. Fikrimizcə, bu metodun əsas ana prinsipindən yuxarı siniflərdə və ali təhsildə də bir strategiya kimi istifadə olunması təhsilin səviyyəsini yüksəldəcəkdir. Bununla yanaşı, texnologiyaların hərtərəfli istifadəsi sosial inteqrasiyaya, həm də boş vaxtdan məhsuldar istifadəyə, sərbəst öyrənmə və özünüinkişaf üçün də faydalıdır.

Təcrübələr göstərir ki, bəzən uşaq və gənclər üçün rəqəmsal texnologiyalardan istifadə və onlara məruz qalma və onlardan faydalanma onların məqsədindən və yanaşma tərzindən asılıdır. Tədqiqatlar göstərir ki, uşaqların internetdən istifadəsinin faydaları çoxdur: onlarda ünsiyyətin gücləndirilməsi, sosial əlaqələrin genişləndirilməsi, texniki bacarıqlara yiyələnmə, özünə hörmətin yüksəlməsi, sosial kapitalın, sosial dəstək, təhlükəsiz şəxsi təcrübə və imkanların artırılmasının müşahidə edilməsi və s. Məlumdur ki, rəqəmsal texnologiyalardan innovativ istifadə təhsil sahəsində və məişətdə, sosial-iqtisadi ehtiyacların ödənilməsi üçün də faydalıdır.

İlkin strategiya məktəblərin İKT infrastrukturu ilə təchiz edilməsindən və bu məqsəd üçün xüsusi olaraq nəzərdə tutulmuş məkan üçün qoşulmadan ibarət idi. Bu yer kompüter laboratoriyası idi, sonralar danışıq dilində "Sala Enlaces" (ingilis dilində "Enlaces Classroom") kimi də tanındı. Daha sonra proqram tədris-təlim prosesini dəstəkləmək üçün İKT-nin istifadəsi üçün şəraitin gücləndirilməsinə daha çox əhəmiyyət verdi, çünki müqayisəli sübutlar aşkar etdikdən sonra məktəb sistemində texnologiyanın sadəcə mövcud olması məktəb agentləri tərəfindən ondan səmərəli istifadəni təmin etmir. Zaman keçdikcə İKT-nin məktəb sisteminə daxil edilməsinin təsirlərinin ölçülməsi ehtiyacını ödəmək üçün onun dinamikasını və əhatə dairəsini şərh etmək üçün çərçivəyə malik olmaq zəruri hala gəlmişdir. Beləliklə, məktəb mühitində təhsil məqsədləri üçün İKT-nin istifadə edilməsi, mövcudluğu, tezliyi və səmərəli istifadəsi kimi başa düşülən nüfuz dərəcəsi getdikcə artmaqdadır. Araşdırmalar göstərir ki, şagirdlərin subyektiv rifahı onların oxuduqları məktəbdəki sosial rifah və məktəb iqlimi ilə sıx bağlıdır, lakin məktəbin rəqəmsal inkişafının və pedaqoji heyətin rəqəmsal bacarıqlarının bu sahədəki inkişafı da əsas şərtlərdən biridir. Elektron hökümət, elektron məktəb, elektron universitet, elektron jurnal və s. terminlərinin təkcə yazıda yox, əməli fəaliyyətdə də normal işləməsi üçün texnoloji bacarıqların rəqəmsal təhsil formatının inkişafına təsirini artırmalıyıq.

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MS TEAMS PLATFORMASINDA TƏLƏBƏNİN QİYMƏTLƏNDİRİLMƏSİ

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Məqalənin əsas məzmunu qiymətləndirmə fəaliyyətinin qanuniliyini təmin edən prinsiplərin müəyyənləşdirilməsinə, bu fəaliyyətin aparıcı istiqamətlərinin təyin edilməsinə, qiymətləndirmə tədbirlərini həyata keçirən qurumların sosial statusunun gücləndirilməsinə, qiymətləndirmədən təlim və tədrisin ehtiyaclarını ödəmək üçün istifadə edilməsinə yönəldilmişdir.

"Microsoft Teams" proqramında qiymətləndirmənin təyin edilməsi test və tapşırıqların hazırlanması zamanı təyin edilir. Tapşırıqların hazırlanması zamanı mütləq həmin tapşırığa verilən bal müvafiq sahədə qeyd edilir. Bu tapşırıq üçün nəzərdə tutulmuş bal sahəsində qeyd edilir. Eyni qaydada testlər üçün də hər bir suala verilən bal testin hazırlanması zamanı pəncərədə yerləşən sahəsində qeyd edilir.

STUDENT ASSESSMENT ON THE MS TEAMS PLATFORM

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Summary

The main content of the article is focused on determining the principles that ensure the legality of evaluation activity, determining the leading directions of this activity, strengthening the social status of institutions that implement evaluation measures, and using evaluation to meet the needs of training and education.

Assessment in Microsoft Teams is determined during the preparation of tests and assignments. During the preparation of tasks, the score assigned to that task must be recorded in the appropriate field. This is recorded in the score field provided for the task. In the same way, for tests, the score given to each question is recorded in the field located in the window during the preparation of the test.

Açar sözlər: MS Teams, dərs, test, qiymətləndırmə, qeyri - səlis məntiq
Key words: MS Teams, lesson, test, assessment, grading system, fuzzy logic

Giriş

Informasiya texnologiyalarının inkişafı bir sıra aktual problemlərin həllinə imkan verir. Belə problemlərdən biri təhsilin keyfiyyətinin artırılması, tələbələrin ixtisas hazırlığının obyektiv qiymətləndirilməsidir. Qiymətləndirmə sistemi tələbələr üçün şəffaf və daha ədalətli olmalıdır.

Tələbələr ənənəvi qiymətləndirmə sistemindəki qeyrimüəyyənlikdən istifadə edərək onlara lazım olan bilikləri əldə etməyə deyil, arzu etdikləri qiymətləri almağa can atırlar. Ənənəvi qiymətləndirmə sistemində olan qeyri-müəyyənliyi minimuma endirməklə onların obyektiv qiymətləndirilməsinə nail olmaq olar.

Adətən tələbələri qiymətləndirərkən cavabın doğruluğu və dəqiqliyi nəzərə alınır və onlara nəzərən orta qiymət çıxarılır. Daha dəqiq və ədalətli qiymətləndirmə aparmaq üçün cavabların doğruluğundan başqa sualların da çətinlik dərəcəsi nəzərə alınmalıdır. Elə sistem hazırlanmalıdır ki, cavabların dəqiqliyindən, doğruluğundan başqa sualın mürəkkəblik, çətinlik və önəmlilik

səviyyəsi də nəzərə alınsın. Belə verilənlər üçün dəqiq meyar yoxdur, yəni onlarla işləmək üçün yeni nəzəriyyədən, qeyri - səlis məntiq nəzəriyyəsindən istifadə etmək olar. Azərbaycan əsilli amerika riyaziyyatçısı Lütfi Zadənin 1965-ci ildə əsasını qoyduğu qeyri-səlis məntiq nəzəriyyəsi müvəffəqiyyətlə bu günə qədər məişət texnikasının idarəedilməsindən tutmuş qeyri-müəyyənlik şəraitində qərar qəbul etmə, layihələndirmə problemlərinə qədər bütün sahələrdə tətbiq olunur. Niyə də tələbələrin attestasiyasına, onların professional hazırlığının qiymətləndirilməsinə tətbiq olunmasın.

MS Microsoft Teams platformasında test hazırlayarkən qiymətləndirmə sistemi üçün qeyri-səlis məntiq nəzəriyyəsindən istifadə edərək, suala cavabın doğruluğundan başqa iki meyar seçmək olar: sualın çətinliyi və cavabın nəzərdə tutulan vaxtda verilməsi. Yetirilmiş test və tapşırıqların qiymətlərini görmək üçün uyğun komandanın ümumi pəncərəsində (Qiymətləndirmə) sahəsini seçmək lazımdır. Cədvəldə sütunlarda tələbələrə verilmiş tapşırıq və testlər, sətrlərdə isə tapşırıq və testlərin yönləndirildiyi tələblər əks olunur. Xanalarda isə tələblərin testi yerinə yetirmə vəziyyəti ilə bağlı məlumatlar əks olunur: Ədədlər – tələbənin tapşırıq və ya testi yerinə yetirməsi nəticəsində əldə edilən balı göstərir. Edilib – tələbənin tapşırıq və ya testi yerinə yetirdiyini göstərir. Bu məlumat xanaya adətən tapşırıq və ya testə əvvəlcədən bal təyin olunmadıqda çıxır. Baxılıb – tələbənin tapşırıq və ya testə baxdığını, ancaq onu yerinə yetirmədiyini göstərir.On test hazırlayaq, ənənəvi qiymətləndirməyə görə hər doğru cavabın çəkisini 1 bal götürək. Sonra sualların çətinlik dərəcəsi olaraq çətin, orta, asan meyarlarını seçərək sualların çəkisini hesablayaq. Asan testin çəkisini x, orta test çəkisini 2x, çətin test çəkisini 4x qebul edək. İki çətin, dörd orta, dörd asan test hazırlansa, maksimum bal 10 bal olduğundan bir asan sualın çəkisini x=0,5 olar. Nəticədə bir cətin sualı 2 balla, orta səviyyəli sualı 1 balla, asan sualı isə 0,5 balla qiymətləndirmək olar. Teams platformasında testləri hazırlayıb hər bir testin səviyyəsinə görə balları təyin edək. Gecikdirmə meyarına görə balı proqram özü tənzimləyir, cavabı gecikdirmiş tələbənin ümumi balından bir bal çıxılır. Bir qrup tələbə üçün bu sistemi tətbiq edərək aşağıdakı nəticələri aldıq:

Göründüyü kimi ənənəvi qiymətləndirmənin nəticəsinə nisbətən qeyri - səlis məntiq nəzəriyyəsinin elementlərindən istifadə olunaraq qurulan qiymətləndirmə sistemı daha dəqiq nəticələr verir. Aydındır ki, qiymətləndirmə kriteriyalarının sayı artırıldıqca qiymətlərin dəqiqliyı dahada artar.

Beləliklə, sualın mürəkkəbliyini və tapşırıqların vaxtında yerinə yetirilməsi kriteriyalarını nəzərə alaraq balları korrektə edən qeyri-səlis sistemi nəzərdən keçirdik və gördük ki, bu sistem tələbəni daha obyektiv qiymətləndirməyə imkan verir. Ənənəvi və qeyri-səlis qiymətləndirmənin müqayisəsi ikincinin daha dəqiq olduğunu göstərir. Bu mexanizmin ardıcıl tətbiqi tədrisin keyfiyyətini artırmağa, keçilən materialın mənimsənilməsi dinamikasına nəzarət etməyə imkan verir, aralıq və yekun attestasiyanın keçirilməsində istifadə oluna bilər. Bu üsula kompüter texnologiyalarının tətbiqi onu daha da effektiv edir. Belə bir sistemin köməyilə yalnız fənn tədrisinin qiymətlərini deyil, həm də ali məktəbi bitirən tələbənin professional hazırlığını da yoxlamaq olar. Təhsilin nəticələrinə qoyulan yeni tələblər onların professional hazırlığının keyfiyyətinin qiymətləndirilməsi metodunun təkmilləşdirilməsini tələb edir. Bal- reytinq sistemi alı məktəb tələbəsinin professional hazırlığını yoxlamaq üçün nəzərdə tutulan ən obyektiv üsuldur. Tələbənin hər hansı fənni öyrənməyə başlayandan sona qədər tələbənin reytinqini formalaşdırır. Tədris kursu bir neçə məntiqi bütöv modullara bölünür və hər modulun tədrisindən qiymətləndirmə aparılır. Tələbənin dərsə davamiyyəti, dərsdə aktivliyi, əldə etdiyi nıəticələr qiymətləndirilir. Bu sistem tələbədə tədris proqramını öyrənməyə motivasiyanı artırır, sistematik, sərbəst işləmə və tədqiqatçılıq bacarığı stimullaşdırır.

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Связь STEM-образования и машинного обучения

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Аннотация

В этой статье рассматривается связь между образованием STEM (наука, технология, инженерия и математика) и машинным обучением. STEM - образование предполагает обучение учащихся науке, технологиям и техническим навыкам, а также развитие у них математического и алгоритмического мышления. А машинное обучение-это область, направленная на повышение способности компьютеров выполнять конкретные задачи самостоятельно, работая с большими данными. В статье анализируется, как внедрение машинного обучения в предметы STEM способствует развитию у учащихся навыков логического мышления, вычислений, анализа данных и моделирования. Кроме того, подчеркивается необходимость и преимущества подготовки учащихся к будущим технологическим специальностям посредством слияния STEM и машинного обучения. Сочетание STEM-образования и машинного обучения позволяет новому поколению эффективно функционировать в цифровом обществе и приобретать профессиональные навыки в области искусственного интеллекта и науки о данных.

Ключевые слова:

STEM образование, машинное обучение, искусственный интеллект, алгоритмическое мышление, программирование, технические навыки, цифровое общество, математическое моделирование, проекты STEM.

Связь STEM-образования и машинного обучения

В настоящее время развитие науки и техники в цифровом обществе делает особенно важным взаимосвязь образования и машинного обучения STEM (наука, технологии, инженерия и математика). Искусственный интеллект и технологии, основанные на данных, ітакже глубоко интегрированы в систему образования, требуя, чтобы учащиеся приобретали новые навыки и компетенции. В этой статье рассматривается сущность STEM-образования, его отношение к машинному обучению, а также преимущества их интеграции.

STEM-образование-это интегрированная система обучения науке, технологиям, инженерии и математике. Его цель-способствовать развитию у учащихся навыков научного мышления, технических навыков и интереса к инженерии и математике. Эта образовательная модель является единственным способом подготовиться к будущим специальностям, поскольку дисциплины STEM составляют основу технологического развития и инноваций.

В модели обучения STEM особое внимание уделяется практике, а не теории. Учащиеся работают над конкретными проектами и развивают навыки творческого и логического мышления при решении задач. Этот подход позволяет специализировать учащихся в областях, которые будут актуальны в будущем, включая области машинного обучения, науки о данных и искусственного интеллекта.

Подходы к машинному обучению в STEM-образовании

При внедрении машинного обучения в дисциплины STEM используются различные методы и инструменты:

- Проектное обучение: учащиеся работают над проектами, которые решают конкретные проблемы, используя модели машинного обучения. Такой подход помогает им развивать аналитическое и логическое мышление.
- Лабораторные занятия: в лабораториях STEM учащиеся работают с алгоритмами машинного обучения, чтобы научиться анализировать данные и создавать модели.
- Интерактивные учебные платформы: такие платформы, как Coursera, Khan Academy, Udacity, предлагают онлайн-курсы, подходящие для обучения машинному обучению по предметам STEM.
- Обучение языкам программирования: такие языки, как Python, R, MATLAB, идеально подходят для выполнения задач на основе машинного обучения. Изучение этих языков в предметах STEM развивает технические навыки учащихся.

Машинное обучение-это способность компьютеров выполнять определенные задачи самостоятельно, обрабатывая большие объемы данных. Многие навыки, связанные с машинным обучением, можно приобрести в дисциплинах STEM. Например, математическое моделирование, статистика и алгоритмы являются основными компонентами машинного обучения.

Ключевые аспекты взаимосвязи STEM и машинного обучения:

1. Математика и Статистика:
   Машинное обучение основано на математических расчетах и статистическом анализе. STEM-образование предоставляет учащимся глубокие знания математики и статистики, облегчая им понимание основных принципов машинного обучения. Здесь важное место занимают линейная алгебра, теория вероятностей и статистический анализ данных.
2. Навыки программирования:
   Машинное обучение требует знания языков программирования, поскольку обработка данных и построение моделей выполняются с помощью алгоритмов. Предметы STEM позволяют учащимся изучать языки программирования, особенно Python, R или Java. Развитие навыков программирования обучает учащихся умению создавать модели машинного обучения и совершенствовать их.

   3. Практические работы и проекты
   STEM-образование уделяет особое внимание проектному обучению, позволяя учащимся изучать машинное обучение с помощью конкретных прикладных проектов. В проектах STEM выполняются такие задачи, как сбор данных, их анализ и использование моделей машинного обучения. Такой подход развивает у учащихся навыки решения проблем и повышает их логическое мышление.
3. Алгоритмическое Мышление
   STEM-образование развивает логическое и алгоритмическое мышление, что особенно важно в машинном обучении. Учащиеся учатся решать задачи, разбивая их на алгоритмы, работать с данными и принимать решения. Эти навыки помогают им эффективно использовать системы машинного обучения.

Сочетание STEM и машинного обучения помогает учащимся овладеть компетенциями, отвечающими потребностям современного цифрового общества. Эта образовательная модель дает учащимся несколько преимуществ:

- STEM-образование и машинное обучение адаптируют учащихся к текущим и будущим технологическим достижениям. Сочетание этих двух направлений не только повышает интерес учащихся к науке и технике, но и ведет их к профессиональному направлению.

- STEM-образование и машинное обучение учат учащихся систематически решать проблемы. Овладение наукой о данных и навыками машинного обучения вооружает учащихся навыками комплексного анализа данных, извлечения из них необходимой информации и поиска эффективных решений.
- STEM-образование усиливает подготовку к новым специальностям в области искусственного интеллекта и науки о данных. С помощью предметов STEM учащиеся могут быть подготовлены к новым специальностям, таким как ученые-данные, инженеры машинного обучения или специалисты по искусственному интеллекту

Связь между STEM-образованием и машинным обучением.

В настоящее время развитие науки и техники в цифровом обществе делает особенно важным взаимосвязь образования и машинного обучения STEM (наука, технологии, инженерия и математика). Искусственный интеллект и технологии, основанные на данных, также глубоко интегрированы в систему образования, требуя, чтобы учащиеся приобретали новые навыки и компетенции. В этой статье рассматривается сущность STEM-образования, его отношение к машинному обучению, а также преимущества их интеграции.

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В настоящее время внедрение машинного обучения в систему образования STEM является распространенной тенденцией. Многие школы и университеты рассматривают курсы искусственного интеллекта, науки о данных и машинного обучения как неотъемлемую часть программ STEM. Учащиеся, обучающиеся по направлениям STEM, будут готовы идти в ногу с будущим быстрым развитием технологических инноваций и искусственного интеллекта.

Интеграция STEM и машинного обучения позволяет развивать как профессиональные, так и научные компетенции учащихся, а также готовит их к специальностям в высокотехнологичных областях. По мере развития системы образования в этом направлении внедряются новые инновационные подходы, углубляются связи между STEM и машинным обучением.

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Development of a system for notification of dangerous sounds using machine learning methods

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Abstract

The rapid urbanization of cities has resulted in increased noise pollution and the prevalence of sounds that can signify dangerous situations, such as gunshots, screams, and alarms. Traditional methods of sound detection often fall short in accuracy and efficiency, leading to delays in emergency responses and increased risks to public safety. This paper presents the development of a machine learning-based system designed to identify and notify authorities about dangerous sounds in real-time. Through data collection, feature extraction, model training, and the implementation of a notification system, we aim to create a reliable solution that enhances public safety. This study also addresses ethical considerations related to privacy and algorithmic bias, ensuring that the proposed system is both effective and responsible.

1. Introduction

1.1 Background

Urbanization has transformed cities into dynamic and densely populated environments, characterized by a rich tapestry of sounds. This complex acoustic landscape is both a hallmark of modern life and a challenge for public safety. While many sounds signify the vibrancy of urban life—such as traffic, conversations, and entertainment—others can indicate emergencies or dangerous situations, requiring immediate attention[1]. Sounds like gunshots, screams, and alarm systems signal critical incidents that can have serious implications for safety and security. As cities continue to grow, the ability to detect and respond to these dangerous sounds quickly and accurately has become increasingly vital.

The urban soundscape comprises a wide array of auditory stimuli, each contributing to the environment's overall character. Everyday sounds—car horns, construction noise, chatter—form a continuous background[2]. However, the presence of dangerous sounds within this cacophony poses unique challenges. For example, the sound of gunfire may be indistinguishable from the noise of fireworks or construction equipment, especially in a bustling metropolitan area. Similarly, screams or distress signals can be easily drowned out by the din of urban life.

This complexity makes the timely identification of dangerous sounds a significant challenge[3]. Traditional sound detection systems often struggle to discern critical audio cues amidst the ambient noise, leading to potential delays in emergency response and heightened risks to public safety. Furthermore, reliance on human monitoring can introduce delays and human error, particularly in high-stress situations where operators may overlook important signals.

Timely and accurate sound detection can greatly influence the outcomes of emergencies. Rapid recognition of dangerous sounds allows for quicker responses from law enforcement and emergency services, potentially preventing harm and saving lives[4]. For instance, in a scenario involving gunfire, immediate alerts to law enforcement can facilitate rapid intervention, while delayed recognition can result in catastrophic consequences. The effectiveness of emergency response systems hinges on their ability to accurately detect and classify sounds in real-time.

Unfortunately, many traditional systems fall short in this regard. They often generate high rates of false positives, where benign sounds are misidentified as threats. This not only strains emergency resources but can also create panic within the community, leading to a loss of trust in the systems designed to protect them. As a result, there is a growing need for more advanced and reliable sound detection solutions[5].

Recent advancements in machine learning and artificial intelligence offer promising solutions to the challenges of sound detection. Machine learning algorithms are capable of analyzing large volumes of data, learning to identify complex patterns and characteristics within audio signals. By training models on extensive datasets that encompass both dangerous and non-dangerous sounds, these systems can be designed to recognize subtle distinctions, enhancing their accuracy and reliability.

Deep learning techniques, particularly the use of Convolutional Neural Networks (CNNs), have shown exceptional performance in audio classification tasks. CNNs excel at identifying intricate features within data, making them particularly effective for sound recognition applications[6]. By leveraging these advanced techniques, it is possible to create systems that not only detect dangerous sounds with high precision but also adapt to evolving urban soundscapes over time.

The implementation of machine learning-based sound detection systems has the potential to revolutionize public safety in urban environments. Such systems can continuously monitor audio streams in real-time, automatically identifying and notifying authorities of dangerous sounds[7]. For example, a system that accurately detects gunshots can trigger alerts to law enforcement, enabling them to respond immediately to potential threats.

In addition to enhancing emergency response capabilities, these systems can also improve community awareness. By providing notifications through mobile applications or public alert systems, residents can be informed of nearby dangers, empowering them to take appropriate actions to protect themselves.

While the benefits of a machine learning-based sound detection system are evident, it is crucial to address the ethical implications of its implementation. Continuous monitoring of public spaces raises significant privacy concerns, as individuals may feel uneasy knowing their auditory environment is being surveilled[8]. Establishing clear guidelines and regulations governing the use of such technologies is essential to ensure compliance with privacy laws and to protect citizens' rights. Moreover, the risk of algorithmic bias must be taken into account. Machine learning models rely on the quality and diversity of their training data. If the datasets used to train these models lack representation or contain biased examples, the resulting system may inadvertently perpetuate inequalities, leading to unfair treatment of specific communities. Ensuring that the training datasets are diverse and inclusive will be critical in developing a fair and equitable sound detection system. Given the complexities associated with urban environments and the challenges of traditional sound detection methods, there is an urgent need for an integrated approach that combines technology, policy, and community engagement. Such an approach should prioritize the development of sound detection systems that are not only technologically advanced but also socially responsible. Collaboration among stakeholders—including city planners, law enforcement, technology developers, and community organizations—will be vital in designing systems that meet the needs of the public while ensuring accountability and transparency[9].

2. Literature Review

The exploration of sound detection technologies has gained momentum over the past few decades, particularly with the advent of machine learning and artificial intelligence. This literature review outlines the current state of research related to sound detection systems, focusing on the

application of machine learning methods, the challenges faced in urban environments, and ethical considerations that arise from the use of such technologies[10].

2.1 Sound Detection Technologies

Sound detection has evolved significantly from traditional acoustic monitoring systems to advanced machine learning algorithms[11]. Early systems primarily relied on human operators to monitor audio feeds or basic algorithms that lacked the sophistication required for accurate classification. Such methods often struggle with high false positive rates, misclassifying benign sounds as threats. Recent developments have introduced automated systems that utilize various machine learning techniques to improve sound classification accuracy. A study by Dufour et al. (2020) highlights the use of feature extraction methods, such as Mel-frequency cepstral coefficients (MFCCs) and spectrogram analysis, to convert audio signals into a form suitable for machine learning algorithms. These techniques allow for the effective representation of sound data, enabling models to learn distinguishing features between different types of sounds[12].

2.2 Machine Learning in Sound Classification

Machine learning has emerged as a powerful tool for sound classification, particularly through the use of supervised and unsupervised learning techniques. Research indicates that deep learning methods, particularly Convolutional Neural Networks (CNNs), have shown superior performance in audio classification tasks compared to traditional methods (Hinton et al., 2012). CNNs are designed to identify complex patterns within data, making them ideal for recognizing the nuanced characteristics of sound[13]. A study by Piczak (2015) illustrates the effectiveness of CNNs in classifying environmental sounds, achieving high accuracy rates in distinguishing between different categories of audio signals. Similarly, Wang et al. (2019) demonstrated the potential of recurrent neural networks (RNNs) for recognizing temporal patterns in sound, which is particularly beneficial for detecting sounds that evolve over time, such as screams or alarms[14].

2.3 Applications in Urban Environments

The application of machine learning-based sound detection systems in urban environments has significant implications for public safety[15]. Research by Aditya et al. (2021) emphasizes the potential of these systems to monitor urban soundscapes in real time, enabling rapid response to incidents like gunshots or distress calls. The integration of audio monitoring with emergency response systems can enhance situational awareness for law enforcement and emergency services, potentially reducing response times and improving outcomes in critical situations[16]. Moreover, machine learning models can be designed to adapt to the specific acoustic characteristics of different urban environments. A study by Aizawa et al. (2020) highlights the importance of contextualizing sound detection algorithms based on local sound profiles, suggesting that a one-size-fits-all approach may not be effective. By tailoring models to the unique soundscapes of various neighborhoods, researchers can improve detection accuracy and reduce false alarms.

2.4 Challenges and Limitations

Despite the advances in sound detection technologies, several challenges persist. One major issue is the high variability of sounds in urban environments[17]. Background noise can significantly obscure critical signals, complicating the detection process (Davis et al., 2019). Furthermore, many existing systems require large labeled datasets for training, which can be difficult to obtain, especially for rare or context-specific sounds.

Another challenge is the need for real-time processing capabilities. Most traditional systems struggle to analyze audio data quickly enough to provide timely alerts. Studies like those

by Zhang et al. (2021) highlight the importance of optimizing machine learning models for real-time performance, necessitating the use of efficient algorithms and hardware.

2.5 Ethical Considerations

The deployment of machine learning-based sound detection systems raises important ethical concerns[18]. Privacy issues are paramount; continuous audio monitoring in public spaces can infringe on individuals' rights and lead to potential misuse of data (Lyon, 2018). Establishing clear guidelines for the ethical use of sound detection technologies is essential to ensure that citizens feel safe and protected rather than surveilled. Additionally, the risk of algorithmic bias must be addressed[19]. If the training data used to develop sound detection models is not representative of diverse populations, the resulting systems may disproportionately affect certain communities (Buolamwini & Gebru, 2018). Ensuring that datasets are inclusive and that models are regularly evaluated for fairness is critical to prevent exacerbating existing social inequalities.

3. Methodology

The development of a machine learning-based system for the notification of dangerous sounds involves several critical steps, including data collection, preprocessing, model selection, training, evaluation, and system implementation[20]. This section outlines the comprehensive methodology employed to create a reliable and effective sound detection system capable of identifying hazardous auditory signals in urban environments.

3.1 Sound Sampling

The first step in developing a sound detection system is to create a comprehensive dataset that includes a wide variety of audio samples representing both dangerous and non-dangerous sounds[21]. The dataset is crucial for training machine learning models effectively.Identification of Sound Categories: We categorize sounds into two primary classes: dangerous sounds (e.g., gunshots, screams, alarms) and non-dangerous sounds (e.g., traffic noise, background chatter). This classification aids in the creation of a balanced dataset. Recording Environments: Sounds are recorded in various urban settings to capture the diversity of auditory environments. Locations include busy streets, parks, residential neighborhoods, and public transport areas. This ensures that the model can generalize across different contexts. Use of Diverse Microphones: To account for variations in audio quality, we utilize multiple recording devices, including handheld recorders, smartphone microphones, and fixed audio sensors[22]. This variety helps simulate real-world conditions and improves the robustness of the dataset. Dataset Size and Structure: Aiming for a dataset of several thousand audio clips, we ensure a balanced representation of each sound category. Each clip is approximately 5-10 seconds long, providing enough context for the models to learn distinguishing features.

3.2 Annotation and Labeling

Once the sound samples are collected, they need to be accurately labeled:

Manual Annotation: Trained annotators label each audio clip according to its sound category. This step is crucial for supervised learning, as it provides the ground truth against which model predictions will be evaluated[23].

Quality Assurance: A quality assurance process involves cross-verifying annotations by a second set of annotators to minimize errors and ensure consistency in labeling.

3.3 Preprocessing

Audio data must undergo several preprocessing steps to enhance the quality of the input for machine learning models: filtering: we apply noise reduction techniques, such as bandpass

filtering, to minimize background noise that could interfere with sound classification, silence removal: segments of audio that contain silence or irrelevant sounds are trimmed to focus on the meaningful portions of the recordings[24].

3.4 Feature Extraction

Transforming audio signals into a format suitable for machine learning involves feature extraction: mel-frequency Cepstral Coefficients (MFCCs): MFCCs are widely used in speech and sound recognition tasks. They provide a representation of the power spectrum of sound, allowing the model to capture the essential characteristics of each sound class. Spectrogram Analysis: spectrograms visually represent the frequency spectrum of sound over time, providing additional context for classification. By analyzing spectrograms, the model can learn to recognize patterns associated with different sound types.

3.5 Model Selection

Supervised Learning Models: We evaluate several supervised learning algorithms, including: Support Vector Machines (SVM): Effective for high-dimensional data and capable of handling non-linear relationships. Random Forests: An ensemble method that can provide robustness and accuracy through multiple decision trees. Deep Learning Models: Convolutional Neural Networks (CNNs). Particularly effective for image and sound data due to their ability to learn spatial hierarchies. Recurrent Neural Networks (RNNs): Useful for temporal data, allowing the model to learn from sequences of audio frames. Cross-validation: A k-fold cross-validation approach is employed to evaluate model performance reliably, ensuring that the models generalize well to unseen data.

4. Model Evaluation

After training, each model is rigorously evaluated to assess its effectiveness:

4.1 Performance Metrics

Accuracy: The proportion of correct predictions to total predictions. Precision and Recall: These metrics are particularly important in emergency detection scenarios, as they measure the system's ability to correctly identify dangerous sounds (precision) and its ability to identify all relevant instances (recall). F1-Score: The harmonic mean of precision and recall, providing a balanced measure of model performance, especially in imbalanced datasets. Confusion Matrix: A confusion matrix is utilized to visualize model performance, highlighting false positives and false negatives across different classes[25].

5. Real-Time Implementation

The final model is integrated into a real-time sound monitoring system:

5.1 System Architecture

Audio Input: The system continuously captures audio through strategically placed microphones in urban environments. Real-Time Processing: Using efficient algorithms, the system processes audio streams in real-time, extracting features and classifying sounds as they occur. Alert Mechanism: Upon detecting a dangerous sound, the system triggers an alert to relevant authorities via automated notifications, ensuring a rapid response.

5.2 Feedback Loop

Continuous Learning: The system incorporates a feedback mechanism that allows it to learn from new audio data. This helps in adapting to changes in the urban soundscape and

improving detection accuracy over time. User Feedback: Input from emergency responders and community members is collected to refine the system further and address any emerging challenges.

6. Results

6.1 Dataset Overview

A detailed analysis of the collected dataset will be presented, highlighting the diversity and balance of sound samples used for training and testing. The dataset's composition will play a crucial role in the performance of the machine learning models.

6.2 Model Performance

The results of the model evaluations will be summarized, comparing the effectiveness of different algorithms. Key performance metrics will indicate which model best identifies dangerous sounds in real-time.

6.3 Case Studies

Illustrative case studies will demonstrate the system's performance in various real-world scenarios, showcasing its practical applications and effectiveness in enhancing public safety.

Conclusion

The development of a machine learning-based notification system for dangerous sounds represents a significant advancement in urban safety technology. By leveraging advanced sound classification techniques, this system can enhance the responsiveness and accuracy of emergency services. Ongoing research will focus on improving model accuracy, expanding the dataset, and addressing ethical challenges to ensure responsible implementation. Future research will explore the integration of additional sensors and data sources, such as video surveillance and social media feeds, to enhance the system's situational awareness. Further studies will also aim to refine the machine learning algorithms to adapt to different urban environments and to better handle the challenges posed by varying noise levels.

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НЕЛИНЕЙНЫЕ ДИФФЕРЕНЦИАЛЬНЫЕ УРАВНЕНИЯ В ГЕОТЕХНИКЕ: АНАЛИЗ И МОДЕЛИРОВАНИЕ НЕЛИНЕЙНЫХ СВОЙСТВ ГРУНТА В СТРОИТЕЛЬНОЙ ИНЖЕНЕРИИ

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В данном исследовании исследуем применение нелинейных дифференциальных уравнений в геотехническом моделировании в области строительной инженерии. На примерах практического применения Matlab рассматриваются современные тенденции в создании более реалистичных и эффективных инженерных моделей. Это исследование выделяет важность программного подхода, предоставляя перспективы для улучшения процессов анализа и проектирования в геотехнической сфере.

In this study, we investigate the application of nonlinear differential equations in geotechnical modeling in the field of civil engineering. Using examples of practical application of Matlab, modern trends in creating more realistic and efficient engineering models are considered. This study highlights the importance of a programmatic approach, providing prospects for improving the analysis and design processes in the geotechnical field.

В области строительной инженерии нелинейные дифференциальные уравнения (НДУ) играют существенную роль, предоставляя возможность более точного моделирования и анализа различных инженерных систем. Примеры применения НДУ представлены на рисунке 1.

Рисунок 1. Развитие инженерной математики в контексте строительного проектирования: роль нелинейных дифференциальных уравнений

Использование нелинейных дифференциальных уравнений позволяет инженерам более точно прогнозировать поведение материалов и конструкций в экстремальных условиях, оптимизировать проектирование и обеспечить безопасность строительных объектов.

В данном исследовании более детально рассмотрим геотехнические задачи (рис.2).

Рисунок 2. Использование НДУ при моделировании

В области геотехнического инжиниринга нелинейные дифференциальные уравнения становятся определяющим фактором, обеспечивая прецизионное моделирование фундаментов в грунте. Эти уравнения играют критическую роль в учете гетерогенности грунта и сложных условий стройплощадки, обеспечивая инженерам способность

прогнозировать деформации и распределение нагрузок. Применение нелинейных моделей в геотехнике, особенно при анализе устойчивости склонов и моделировании грунтовых фундаментов, содействует более точным исследованиям, способствуя повышению устойчивости и долговечности инженерных сооружений.

Рассмотрим задачу геотехнического инжиниринга, связанную с устойчивостью склона. Предположим, у нас есть наклонный грунтовой склон, и мы хотим оценить его устойчивость под воздействием различных нагрузок.

Допустим, мы моделируем грунт как нелинейный материал с учетом его пластичности. Уравнение устойчивости склона опишем в виде:

$$\frac{dh}{d\sigma_v} = \frac{\gamma si \quad (\beta)}{c \cdot \cos(\beta)},$$

где $\frac{dh}{d\sigma_v}$ - производная глубины по вертикальному напряжению; γ – весовая плотность грунта; β – угол наклона склона; c – когезионная прочность грунта.

Для решения воспользуемся методами численного интегрирования, реализованными в интерактивной среде MATLAB (рис.4).

```
% Уравнение устойчивости склона
dh_dsigma = @(sigma_v) gamma * sind(beta) / (c * cosd(beta));

% Решение дифференциального уравнения
sigma_v_range = linspace(0, 1000, 1000); % диапазон значений вертикального напряжения
h_values = zeros(size(sigma_v_range));

h_values(1) = 0; % начальная глубина

for i = 2:length(sigma_v_range)
    h_values(i) = h_values(i - 1) + dh_dsigma(sigma_v_range(i - 1)) * (sigma_v_range(i) - sigma_v_range(i - 1));
end
```

Рисунок 3. Фрагмент кода, реализованного для решения поставленной задачи

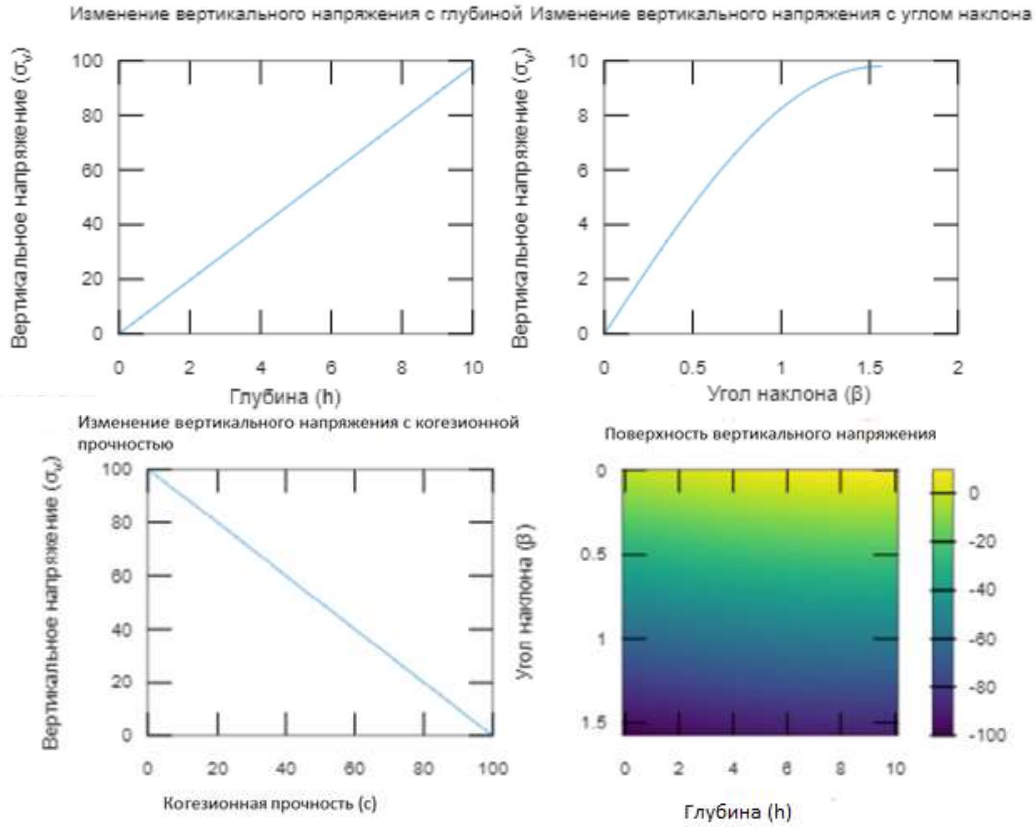

Рисунок 4. Изменения вертикального напряжения в зависимости от весовой плотности грунта, угла наклона и когезионной прочности.

Анализ результатов моделирования вертикального напряжения (рис.4) в грунте на основе изменения параметров (γ, β, c) позволяет выделить следующие научные выводы:

1. Увеличение весовой плотности грунта оказывает пропорциональное влияние на увеличение вертикального напряжения. Наблюдается увеличение градиента вертикального напряжения с глубиной, что свидетельствует о более интенсивном воздействии груза на грунт.

2. Увеличение угла наклона требует более высокого вертикального напряжения для поддержания устойчивости, что подчеркивает важность инженерного анализа склоновых конструкций.

3. Повышение когезионной прочности грунта сопровождается уменьшением вертикального напряжения. Более прочный грунт требует менее интенсивного вертикального нагружения, что может иметь существенное значение при проектировании геотехнических конструкций.

4. Написанный код позволяет, экспериментируя с различными значениями параметров, наблюдать, как эти изменения влияют на результаты моделирования и поддерживают или уменьшают устойчивость склона.

Таким образом проведенное исследование учитывает изменения параметров на инженерные характеристики грунта, а код предоставляет инженерам основу для дополнительных детализированных исследований.

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The syncretic project management model in BANI environment

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Abstract. The syncretic project management model offers a novel approach to navigating the complexities of contemporary project environments, particularly those characterized by BANI (Brittle, Anxious, Nonlinear, Incomprehensible) conditions. By integrating interdisciplinary collaboration, agile methodologies, and artificial intelligence, this model seeks to enhance project resilience, adaptability, and innovation. This research explores the theoretical underpinnings of syncretic project management, examining its core components and the mechanisms through which it addresses the challenges posed by BANI environments. The study contributes to the evolving body of knowledge on project management by providing a comprehensive framework that can be applied across various industries and project contexts. This paper proposes a mathematical framework using category theory to maintain consistency between various system engineering models, improving the relevance of analyses in critical systems. In recent decades, there has been a significant increase in systems' complexity, leading to a rise in the need for more and more models. Models created with different intents are written using different formalisms and give diverse system representations.

Keywords: Syncretic, Project management, Mathematical model, BANI environment.

Introduction

Project management involves orchestrating various elements, aligning resources, and making strategic decisions to achieve specific objectives within a defined timeframe. To enhance the understanding and effectiveness of project management, the concept of a syncretic project management mathematical model is introduced. This model seeks to amalgamate diverse factors that influence project success into a comprehensive framework, fostering a holistic approach to project planning and execution. Traditional project management models often focus on specific methodologies, tools, or processes, emphasizing linear and sequential approaches. However, real-world projects are inherently complex and dynamic, influenced by multifaceted factors such as organizational culture, stakeholder dynamics, and external environmental changes. The syncretic project management model acknowledges this complexity and aims to integrate various dimensions, providing a more adaptive and inclusive perspective. Syncretism refers to the amalgamation or reconciliation of different beliefs, practices, or ideas. In the context of project management, syncretism involves blending diverse project management methodologies, incorporating interdisciplinary knowledge, and harmonizing varying stakeholder perspectives. This

approach recognizes that a one-size-fits-all methodology may not be sufficient for the diverse and evolving nature of projects.

1 Literature review

This paper proposes a mathematical framework using category theory to maintain consistency between various system engineering models, improving the relevance of analyses in critical systems. In recent decades, there has been a significant increase in systems' complexity, leading to a rise in the need for more and more models. Models created with different intents are written using different formalisms and give diverse system representations. This work focuses on the system engineering domain and its models. It is crucial to assert a critical system's compliance with its requirements. Thus, multiple models dedicated to these assertions are designed, such as safety or multi-physics models. As those models are independent of the architecture model, we need to provide means to assert and maintain consistency between them if we want the analyses to be relevant. The model synchronization methodologies give means to work on the consistency between the models through steps of abstraction to a common formalism, comparison, and concretization of the comparison results in the original models. This paper proposes a mathematical framework that allows for a formal definition of such a consistency relation and a mathematical description of the models. We use the context of category theory, as this is a mathematical theory providing great tools for taking into account different abstraction levels and composition of relations. Finally, we show how this mathematical frame-work can be applied to a specific synchronization methodology with a realistic study case [1].

This computational model helps project managers understand tradeoffs between cost, time, and quality in communication plans, aiding in the development of effective communication strategies [2]. Project management is used to coordinate effort during tasks, such as new product design, software engineering, and supply chain improvement. An essential component of project management is the communication plan that directs team members in their use of communication channels for information sharing during the project. Yet, few decision-making tools exist that can help project managers understand the tradeoffs of different communication plans. Herein we connect theory and practice to advance a computational model that provides objective-based assessments of communication plans and helps managers weigh tradeoffs of cost, time, and quality in the use of communication channels across the project. We draw on adaptive structuration theory to understand the impetus to utilize technology in group settings and media richness to explain the capabilities of channels that offer rich synchronous platforms (for e.g., phone, face-to-face, and web conference) and asynchronous lean approaches (for e.g., email, message board, and archive). We describe the tool based on a multiple-criteria decision making model. This model contributes a theoretically based decision support tool for project communication plans.

The developed mathematical model and software for project systems optimize resource allocation and development strategy, reducing dimension problems and enabling parallel calculations. There has been considered the management of project systems taking into account the life cycle of the product. A mathematical model and software for project systems has been developed. The software has modules to adjust the parameters of the mathematical model, enter data and analyze the results of the simulation. The main interpretation of the mathematical model is the complex of production, retail, logistics of components and final products and recycling systems. Technology systems can be in the states of design, construction, and production, modification of technologies and products of production. The purpose of the article is to develop mathematical models: individual production projects, taking into account demand, competition, technology renewal and production of products. Development of project system models with time management in mind. The conceptual theoretical basis of development has been chosen: resource

approach, methodology of optimal aggregation and solution of variation problems of optimal allocation of resources in the processes of operation and development of objects. An integrated mathematical model of "monoproject" has been developed, performing optimal aggregation and optimization of the development strategy. The result of calculations of the module is "monoproject"-matrix structures, similar to the records in databases - solving the problems of optimal operational and strategic management. The variation is solved for a one-dimensional optimal equivalent object followed by "disaggregation" - the distribution of the optimal strategy across all subsystems [3].

This study proposes a BIM-based file synchronization and permission management system that simplifies architectural design collaboration by synchronizing data from different computers and providing a web-based viewer for BIM models [4].

A proactive approach effectively manages complex IT projects, addressing external environmental turbulence and ensuring successful project completion. A conceptual model was built, which facilitated research of the effect of the turbulent environment of the project on all elements of the model. The key branches of knowledge of this effect are identified. We developed the structural model of components in distributed information systems using cloud technologies and design approach, which takes into account the response to dynamic changes and turbulence of the external environment. The mathematical model of the process of creating a complex IT product is constructed, taking into account the influence of the turbulent external environment of the project, the main characteristics and parameters are determined. We performed the modeling of objective functions of the mathematical model of the process of creating a complex IT product [5].

A mathematical model proposed in this study can effectively manage project staff scheduling, achieving both project owner and staff goals within a complex situation. The goal of traditional project management is to complete the project at the earliest possible time in accordance with the available resources without violating priority relations of the activities involved. Unlike traditional project management, this study deals with the possibility of a coalition among the staff available to accomplish tasks of the project. The tasks can be fulfilled by more than one staff members. Staff’s coalition shortens the completion time of the tasks. A natural problem that arises in this case is how to share the income generated. The other side of the problem is concerned with the project owner who wants the project to be completed as early as possible. In this study, a mathematical model proposal is dealt with in order to realize the goals of both the project owner and the staffs as much as possible within the complex structure of the situation [6].

2 Conceptual model of Syncretic Project Management in BANI Environment

Components of the Conceptual Syncretic Project Management Model presented on fig. 1.

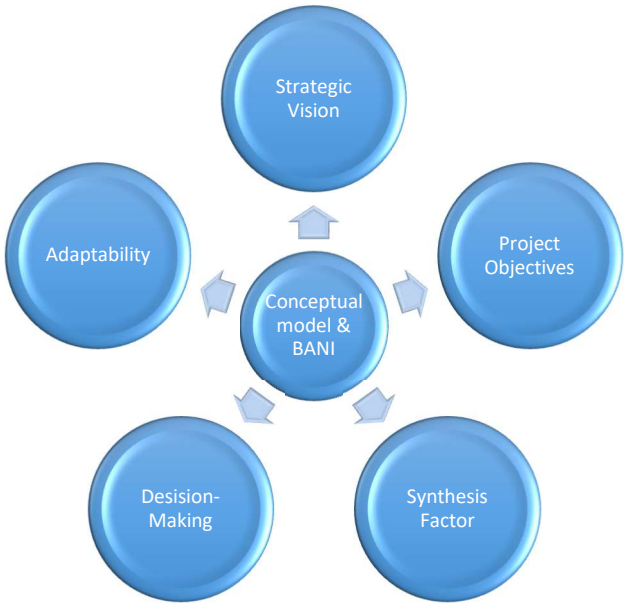

Fig. 1. Conceptual Syncretic Project Management Model

The proposed model integrates key components that collectively contribute to project success. Strategic Vision (V) acknowledging the importance of aligning projects with the overarching strategic vision of the organization. Overall Project Objectives (O) emphasizing the need for clear, measurable, and aligned project objectives to guide planning and execution. Synthesis Factor (S) recognizing the importance of synthesizing information, fostering collaboration, and adapting to dynamic project environments. Decision-Making (D) incorporating effective decision-making processes that consider strategic context, stakeholder input, and project constraints. Adaptability (A) highlighting the necessity of adaptability in responding to unforeseen challenges and changes in the project landscape [7,8].

3 Creating a Syncretic Project Management mathematical model

The syncretic project management model can be represented mathematically as:

$$Project\ Success = f(V,O,S,D,A)$$

This equation signifies that project success is a function of the interplay between strategic vision, project objectives, synthesis capability, decision-making processes, adaptability, and continuous improvement.

Project Definition and Objectives. Define project goals, scope, and objectives using a combination of techniques from traditional and agile methodologies.

Stakeholder Analysis. Use stakeholder analysis techniques to identify and prioritize key stake-holders. Consider both traditional hierarchical stakeholders and agile iterative engagement. Syncretic Project Management mathematical model involves integrating various project management methodologies and techniques into a unified framework. This model aims to leverage the strengths of different approaches while addressing their limitations. The basic outline for a Syncretic Project Management mathematical model is presented on the table 1.

N	Parameter	Equation
1	Work Breakdown Structure (WBS). Combine the hierarchical decomposition of tasks from traditional project management with agile product backlog concepts for iterative development.	*WBS=TraditionalTasks∪AgileBacklog*
2	Time Management. Integrate Critical Path Method (CPM) from traditional project management with iterative scheduling approaches (e.g., Scrum sprints) to create a dynamic project timeline.	*ProjectTimeline=CPM+ AgileIterations*
3	Resource Management. Utilize resource allocation methods from traditional project management with agile team dynamics to ensure optimal resource utilization and flexibility.	*ResourceAllocation=TraditionalMethods+ AgileTeamDynamics*
4	Risk Management. Combine risk identification and assessment from traditional methods with agile risk management strategies, including frequent reassessment and adaptation.	*RiskManagment=TraditionalRiskAssessment+AgileAdaptation*
5	Communication and Collaboration. Integrate communication plans and tools from traditional project management with agile collaborative practices to enhance team communication and coordination.	*Communication=TraditionalPlans+ AgileCollaboration*
6	Quality Management. Merge quality assurance processes from traditional approaches with continuous integration and testing practices from agile methodologies.	*QualityManagement=TraditionalQA+ AgileContinuousIntegration*
7	Monitoring and Control. Combine traditional project monitoring and control mechanisms with agile metrics and feedback loops for real-time visibility and adaptability.	*MonitoringandControl=TraditionalMechanisms+AgileMetrics*
8	Closure and Evaluation. Integrate project closure processes from traditional methodologies with agile retrospective techniques for continuous improvement	*Closure=TraditionalClosureProcesses+ AgileRetrospectives*

9	Governance. Establish a governance framework that balances the need for control and structure with the flexibility and adaptability required in agile environments.	*Governance=BalanceofControl+ Flexibility*
10	Continuous Improvement. Incorporate continuous improvement principles from agile methodologies into the project management process to enhance overall project performance.	*ContinuousImprovement=AgilePrinciples+LessonsLearned*
11	Flexibility Index. Create a flexibility index that measures the project's adaptability to changes, considering both traditional and agile elements.	*FlexibilityIndex=TraditionalAdaptability+ AgileFlexibility*
12	Decision-Making Framework. Develop a decision-making framework that considers both traditional project governance structures and agile empowered teams.	*Decision−Making=TraditionalGovernance+ AgileEmpowerment*

The development of a Syncretic Project Management mathematical model represents a paradigm shift in how we conceptualize and approach project management. By embracing the principles of syncretism, this model recognizes the multifaceted nature of projects and the need for a flexible, adaptive framework that goes beyond rigid methodologies. The integration of various components, including Strategic Vision (V), Overall Project Objectives (O), Synthesis Factor (S), Decision-Making (D), Adaptability (A), and Continuous Improvement (CI), into a unified mathematical equation reflects the intricate web of factors influencing project success. The model emphasizes the importance of aligning projects with the broader strategic vision of the organization, setting clear and measurable objectives, fostering collaboration and synthesis of information, making informed decisions, adapting to dynamic project environments, and continuously improving processes over time. As organizations navigate an increasingly complex and unpredictable business landscape, the Syncretic Project Management model offers a holistic approach that encourages resilience, creativity, and efficiency. It recognizes that successful project management is not a static process but rather an ongoing, dynamic interaction of interconnected elements.

This syncretic model aims to strike a balance between the structured approach of traditional project management and the flexibility of agile methodologies, providing a comprehensive framework for managing complex projects. The specific equations and parameters will need to be tailored based on the unique characteristics and requirements of each project.

Developing a mathematical model for the BANI environment in Syncretic Project Management is a complex task that requires careful consideration of various factors. By combining dynamic systems theory, complexity theory, uncertainty modeling, and agent-based modeling, it is possible to create a valuable tool for understanding and managing projects in such environments.

A mathematical model for the BANI environment in Syncretic Project Management could incorporate the following elements:

Dynamic Systems Theory. To capture the ever-changing nature of the environment, we can use dynamic systems theory, which models systems that evolve over time.

Complexity Theory. To account for the nonlinear and interconnected relationships between variables, complexity theory can be applied.

Uncertainty Modeling. Techniques like fuzzy logic, probability theory, or possibility theory can be used to represent uncertainty and ambiguity.

Agent-Based Modeling. To simulate the interactions between various stakeholders and their impact on the project, agent-based modeling can be employed.

Mathematical Formulation of the simplified mathematical representation could be:

$$X(t+1) = f(X(t), U(t), W(t))$$

where:

f is a complex, nonlinear function that describes the system's dynamics;

$X(t)$ is the state of the system at time t;

$U(t)$ is the control input (e.g., project decisions) at time t;

$W(t)$ is a random disturbance term representing external factors.

4 Case Study: Syncretic Project Management in a BANI Environment

A multinational Education project is developing a new AI-powered platform to assist in implementing Education program 'Artificial intelligence. Cognitive technology' in Kyiv National University of Construction and Architecture. The project is complex, involving multiple teams from different departments, and operates in a rapidly changing and uncertain environment (BANI).

Let's look on the *challenges* of the project.

Rapid Technological Advancements. The field of AI is evolving rapidly, making it difficult to keep up with the latest developments and ensure the platform remains competitive.

Interdisciplinary Collaboration. The project involves teams with diverse expertise, from software development to medical research, making coordination and communication challenging.

Uncertain Market Demand. The market for AI-powered educational project solutions is still emerging, with uncertain demand and potential competition.

Application of the Syncretic Project Management Model.

Interdisciplinary Collaboration. The project team is composed of representatives from various departments, including software engineers, data scientists, medical experts, and regulatory affairs specialists. This fosters a collaborative and interdisciplinary approach to problem-solving.

Agile Methodology. An agile methodology, such as Scrum or Kanban, is used to facilitate flexibility and adaptability in response to changing requirements and market conditions.

AI-Powered Tools. AI tools are used throughout the project lifecycle, from requirements gathering to testing and deployment. These tools help automate tasks, improve decision-making, and identify potential risks.

Risk Management. A robust risk management framework is implemented to identify and mitigate potential risks, such as regulatory changes, technological challenges, and market uncertainties.

Continuous Learning and Adaptation. The project team is committed to continuous learning and adaptation to stay abreast of the latest developments in AI and education.

Results.

Successful Launch. The AI-powered educational program platform is successfully launched, meeting the initial project objectives.

Improved Efficiency. The use of AI tools and agile methodologies has led to increased efficiency and reduced time-to-market.

Enhanced Collaboration. Interdisciplinary collaboration has fostered a culture of innovation and problem-solving.

Mitigated Risks. The risk management framework has helped the project team to identify and address potential challenges proactively.

The importance of flexibility and adaptability. In a BANI environment, it is essential to be prepared to adapt to changing circumstances.

The value of interdisciplinary collaboration. Bringing together experts from different fields can lead to innovative solutions.

The power of AI. AI tools can be used to enhance project management and decision-making.

The syncretic project management model has proven to be effective in managing complex projects in a BANI environment. By combining interdisciplinary collaboration, agile methodologies, and AI-powered tools, organizations can improve project efficiency, mitigate risks, and achieve successful outcomes.

Conclusion

The syncretic project management model offers a dynamic and adaptable framework to navigate the complexities of project management. By acknowledging the interconnectedness of diverse factors, this model provides a more holistic approach, fostering resilience, innovation, and success in an ever-changing project landscape. As we delve deeper into each component and its interactions, the syncretic model aims to enhance our understanding and application of effective project management principles.

Implementing this syncretic model requires a cultural shift within organizations, promoting a mindset of collaboration, adaptability, and a commitment to continuous learning. By doing so, organizations can enhance their project management practices, increase the likelihood of successful project outcomes, and position themselves to thrive in an ever-evolving BANI business environment. In essence, the Syncretic Project Management model provides a versatile and comprehensive toolset that empowers project managers and teams to navigate the complexities of modern projects. By acknowledging the diversity of influences on project success and fostering a holistic understanding, this model sets the stage for a new era of effective, adaptive, and sustainable project management practices.

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Competitiveness of IT companies in Kazakhstan: experience of project managers and strategies using temporary competitive advantage model

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Abstract. This study examines the competitive strategies of IT companies in Kazakhstan, with a focus on the experiences of project managers and the role of effective project management methodologies in achieving market adaptability and fostering innovation. As the technical environment continues to quickly advance, Kazakhstani information technology enterprises are confronted with the combined problem of keeping up with the changes in worldwide markets while also satisfying the expectations of the local market for technological innovation. The purpose of this study is to investigate the ways in which structured project management methodologies, such as Agile, Scrum, and the Temporary Competitive Advantage Model, contribute to the maintenance of competitiveness and the fulfillment of the particular issues that are present in the Kazakhstani market. The research highlights essential practices in team management, ongoing skill development, and proactive risk management. This is accomplished through a mix of a literature analysis and interviews with project managers from major information technology companies. IT organizations are able to accomplish both short-term responsiveness and long-term resilience by combining the Temporary Competitive Advantage Model with Agile frameworks, as demonstrated by the findings. Both of these capabilities are critical for maintaining a competitive position in a market that is always evolving. Despite this, difficulties continue to exist, notably in the areas of innovation management and the distribution of resources for projects that are always going through changes. This study highlights the value of projects management methods that are both adaptive and continuous for Kazakhstani information technology enterprises. These practices enable these organizations to efficiently traverse changes in the sector while simultaneously strengthening their competitive edge.

Keywords: Information technology, IT competitiveness, project management, Agile, Temporary Competitive Advantage Model, Kazakhstan, innovation.

Introduction.

With growing investments in digital infrastructure and a growing number of foreign and local firms setting up business in the region, Kazakhstan's IT sector has become a major catalyst for economic growth. IT companies looking to gain a competitive edge in the global market have faced both opportunities and difficulties as a result of the fast expansion. In today's fast-evolving technological landscape, the competitive advantage of organizations is increasingly defined by their capacity for innovation, skillful project management, and ability to promptly adapt to shifting market dynamics. Project managers play a pivotal role in driving these efforts, ensuring that strategies are executed smoothly, projects are completed on schedule and within budget, and outcomes align with business objectives. This critical function is especially relevant as ICT development and its influence on economic growth have escalated swiftly in both developed and emerging countries, including Kazakhstan [1]. With a 39th-place ranking among 139 countries in global Information and Communication Technology rankings, Kazakhstan demonstrates its

commitment to expanding its IT industry and enhancing its economic impact on the international stage [2]. The nation's leadership has actively enabled this digital transformation. In 2012, President N.A. Nazarbayev, during his speech to the population of Kazakhstan, encouraged a stronger integration of information technology across every part of life. His call to action provided the foundation for increased focus on digital initiatives, which have since become essential components of Kazakhstan's modernization efforts.[3] The significance of information and communication technology to economic growth is substantial, as digital transformation serves as an essential stimulus for enhancing productivity, efficiency, and competitiveness in both public and private sectors. Given the transformative impact ICT has across industries, its role becomes even more pronounced in the 21st century, often referred to as the era of information technology and the knowledge economy [4], where ICT is fundamental in fostering national growth. This economic model underscores the significance of research, education, and sophisticated technical industries. Consequently, IT companies in Kazakhstan must perpetually innovate, enhance operational efficiency, and utilize the expertise of proficient project managers to maintain competitiveness in both domestic and international markets. Consequently, IT companies in Kazakhstan must continually innovate, enhance operational efficiency, and utilize the expertise of proficient project managers to maintain competitiveness in both domestic and international markets.

Project management is crucial for ensuring that IT initiatives connect with broader economic goals, especially in high-tech sectors and human services, therefore contributing to the knowledge-based economy. In this context, project managers not only drive innovation and guarantee operational efficiency but also align project results with strategic objectives, connecting technical execution with overarching economic imperatives. By employing approaches like Agile and Scrum, they support organizations in maintaining adaptability to market fluctuations and technological progress. However, the success of IT initiatives is not solely dependent on effective project management. Competent professionals in IT, especially programmers and technical experts, are essential in implementing the strategies established by project managers. The complementary relationship between strong leadership and technical expertise is critical to a company's ability to maintain its competitiveness in both domestic and international markets, as well as to deliver superior goods to its customers.

Literature review

The impact of ICT infrastructure on economic growth in Kazakhstan

The advancement of Information and Communication Technology (ICT) in Kazakhstan has played a pivotal role in molding the country's social and economic environment. Numerous studies conducted over the past three decades have demonstrated a clear correlation between GDP, productivity, and employment development and the expansion of ICT services and infrastructure [5]. These results demonstrate the importance of ICT as an engine for economic growth, enhancing Kazakhstan's aspirations to fortify its digital economy and increase its prominence internationally. Recognizing that effective communication networks are essential for the successful implementation of digital transformation, the government has pledged to improve ICT accessibility throughout the nation. This commitment is particularly crucial for reducing regional disparities since a strong infrastructure makes it possible for everyone to benefit equally from ICT, which supports economic growth in both rural and urban areas. Enhancing the accessibility of high-speed internet and communication services has been a major priority in order to assist Kazakhstan's industries' productivity and efficiency [1].

Workforce development and adaptability in the age of technological advancement in Kazakhstan

With the growth of technology, much attention is paid to human resources, which are becoming increasingly important for industry and economic growth. Kazakhstan strives to pay

great attention to the development of qualified specialists to support its ICT sector along with the development of infrastructure. Educational institutions, both higher and secondary, are aimed at cultivating future specialists in various fields, including ICT, which is in line with modern educational trends, predicting a significant shift in the required number of professional staff. According to the results of a study by the World Economic Forum, humanity is currently in the midst of the fourth industrial revolution, which has already led to the emergence of technologies such as artificial intelligence, advanced robotics and biotechnology [6]. These technologies are not only changing the perception of the industry, but also redefining the very concept of work, since with the growth of technological breakthroughs, some jobs may become unnecessary, and those that do not yet exist will become commonplace, especially in the field of information technology. This shift therefore requires special attention from government and private companies, prioritising a workforce that can be flexible, adaptable and continually develop new competencies, as in some sectors employees are expected to acquire new skills every two to three years, or even every six months [7].

The concept of competitiveness of IT companies

This emphasis on flexibility directly supports the competitiveness of Kazakhstani companies, where it is necessary not only to keep up with the times, but also to stay ahead of technological changes. Companies that invest in the continuous development of their employees' skills are better prepared for these changes, using modern technologies, effectively responding to changing market demands. Such attention to workforce readiness enables Kazakhstani IT companies to increase resilience and maintain a competitive advantage. Corporate competitiveness is an integral part of success for companies, especially in those sectors where technology and innovation stimulate rapid development and intensify competition. The set of advantageous qualities that allow firms to stay ahead of their competitors is referred to as corporate competitiveness. It is directly related to the company's ability to generate profits and maintain its position in the market [8]. The creation and application of knowledge are key components of competitiveness, creating not only new ideas, but also innovative ways for companies to effectively apply them. The process of competition itself is also supported by knowledge generation, as entrepreneurs continually seek new ways to apply ideas to improve products, services, and profitability. A company that controls the arena of business competition has an advantage that allows the company to capture and maintain a leading position in the market [9]. The competitiveness of ICT companies in Kazakhstan depends on their ability to adopt a model of temporary competitive advantage that embraces flexibility, innovation, and the application of knowledge. By prioritizing adaptability and seizing emerging opportunities, Kazakhstani ICT companies can secure short-term wins while laying the foundation for sustainable growth. This approach not only fits the changing nature of today’s global economy, but also enables local companies to compete internationally, stimulating both regional development and broader economic progress.

Temporary competitive advantage model as a method.

To achieve sustainable competitive advantage, many companies use traditional strategy frameworks such as the BCG matrix, Hamel and Prahalad’s core competency model, and Porter’s five forces model. These methods focus on things like resource allocation, market power, and unique capabilities [10]. On the other hand, more and more people believe that these models are designed for a more stable environment. This is because in today’s business world, where constant change is inevitable, these models do not correspond to reality. In response, companies are faced with the need to develop strategies that will take fluidity into account, allowing them to respond more quickly to market changes and emerging trends [11]. A newer approach to competitiveness

is the concept of temporary competitive advantage, which is particularly well-suited to dynamic and unpredictable environments. This model emphasizes flexibility and adaptability, encouraging companies to actively pursue new opportunities as they emerge, maximize their potential, and then swiftly shift focus to the next advantage before competitors catch up [12].
In the information technology sector, this strategy is particularly important. Companies that cannot maintain this level of flexibility risk losing ground to more responsive competitors, especially as the pace of innovation continues to accelerate [13]. Competition is essential to sustain dynamic market processes in which knowledge generation and use play a critical role [14]. As shown in figure 1, Salgado's model for managing short-term competitive advantages is based on five main components: resource allocation, continuous reconfiguration, mindset, innovative competence, and leadership. These elements are also important in project management. By implementing TCAM principles into project management practices, companies can achieve current goals and lay the foundation for long-term growth.

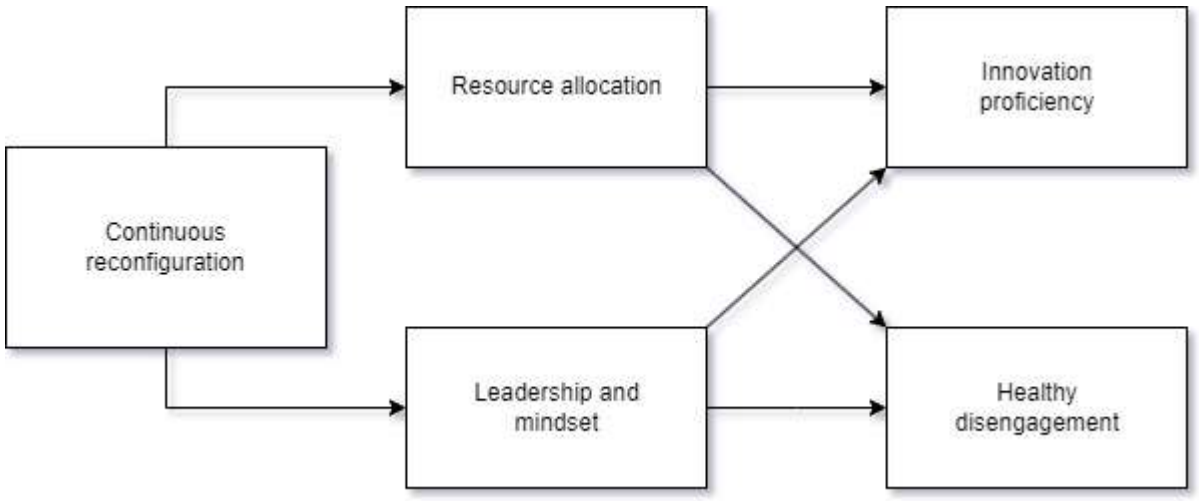

Figure 1. The connection of the TCAM's elements. Salgado et al. (2022).

Evaluation of TCAM implementation and the role of project management in improving competitiveness

In the study by Salgado (2022), the TCAM methodology was introduced in three different companies. The application of the temporary competitive advantage model showed its importance for adaptation and increasing flexibility in a quickly changing market. The implementation of TCAM allowed the companies to demonstrate their strengths, especially in ensuring flexibility, readiness for change and the ability to promptly reorganize processes and resources. All three companies managed to establish effective processes for retraining employees and allocating resources, which allowed them to adapt to changes in requirements and legislation, and also increased the involvement of teams and their readiness for new challenges. Despite this, the companies also faced a number of difficulties that limited the effectiveness of TCAM. One of the main problems was the lack of a systematic approach to innovation management: innovation processes were implemented irregularly, which affected long-term competitive advantages. In addition, the companies experienced difficulties in "healthy parting" with unprofitable or obsolete projects and products. The lack of regular portfolio assessment resulted in resources remaining tied up in ineffective areas that were no longer delivering value. Thus, while TCAM has provided companies with important tools for adaptation and flexibility, realizing its full potential requires a more structured approach to innovation management and regular decisions to eliminate ineffective

projects from the portfolio. Integrating project management methodologies can further enhance these capabilities by providing structured processes and adaptive frameworks.

The role of sustainable project management in achieving TCAM objectives

Project management is an essential tool for attaining objectives, enabling firms to successfully translate TCAM concepts into concrete strategies. According to the Project Management Institute (PMI), project management entails the application of planning, critical thinking, knowledge, skills, and processes to successfully achieve a defined project objective by meeting the specified requirements. This entails a thorough comprehension of the project lifecycle, encompassing initiation, planning, execution, monitoring, and closure. Efficient project management guarantees that all phases are well planned and implemented, hence enhancing the probability of project success. Criteria for good project management have been revised several times to accommodate the increasing complexity and dynamic settings of contemporary projects [15]. These changes are essential as they facilitate the adaptation to the dynamic character of projects, ensuring that project managers are well prepared to address emerging issues. This flexibility is essential in a swiftly changing business landscape, where initiatives must continually develop to address emerging issues and opportunities. The incorporation of sustainability into project management methods is widely acknowledged as essential for the long-term performance and viability of projects, especially considering global challenges such as climate change and social inequality [16]. The significance of sustainability in project management is underscored by the changing responsibilities of project managers, who must increasingly exceed traditional project management competencies by including sustainability considerations across the whole project lifecycle [17].

Agile.

Agile Project Management has gained popularity in recent years, mostly in software sphere [18]. However, it is fast expanding into otherfields [19]. APM originated from software design and development projects for change-adaptive management aims in order to raising project success odds. Not only is agile concept, not just a project management method. based on adaptation, flexibility, and collaboration. The Agile Manifesto, formulated in 2001 by a varied assembly of software professionals aiming to transform traditional software development and project management practices, underpins this technique. The manifesto was created in reaction to the deficiencies and inflexibility of conventional plan-based software development methodologies, such as the "waterfall" model, which are commonly employed. Although the waterfall technique was formerly esteemed, it has faced criticism for its inability to adapt to evolving conditions. Commencing in the late 1990s, software development teams began adopting agile approaches to improve programming processes by increasing user-friendliness.

Scrum.

An Agile framework known as Scrum is a specialized framework that offers structure and roles for the purpose of coordinating team activity. Individuals who make up the Scrum Team are the Product Owner, the Development Team, and the Scrum Master. In addition to possessing all of the necessary expertise to finish the project, this organization is responsible for making all of the choices regarding the project, the team is versatile and self-organized. Sprints, daily standups, and retrospectives are all examples of work cycles that a Scrum framework includes. Within the framework of Scrum, a project is divided into a series of short sprints, which typically span anywhere from one to four weeks. In the beginning of each sprint, there is planning, during which the goals and objectives are determined. After that, every member of the team works hard to finish these tasks during the sprint. An additional behavior that is closely related to the Scrum methodology is the practice of carrying out each task in "development sprints" that last for an

average of fourteen to twenty days [20]. As soon as each sprint is finished, the team gets together for a "retrospective" meeting to discuss the experiences they've had in the past and to pinpoint areas in which they could make improvements [21].

Kanban.

The Kanban system is an element of the lean manufacturing framework. The Kanban method offers several benefits for organizational operations and management. According to the Kanban approach, manufacturing is necessitated only by the demand for existing items. Numerous Japanese enterprises have adopted the Kanban method for its capacity to reduce expenses by mitigating overproduction, establishing adaptable workstations, decreasing waste and scrap, minimizing wait times and transportation expenditures, and therefore cutting inventory stock levels and overhead costs. It is prudent to adopt the Kanban method for the manufacturing lines. It improves the company's efficiency while simultaneously reducing production waste.

However, modern project management methodologies such as Agile, Scrum, and Kanban inherently support the components of TCAM. The Agile project management method is similar to continuous reconfiguration, where the project evolves in short iterative cycles called sprints, allowing teams to adapt their project goals and processes based on customer feedback. This is what differentiates Agile Project Success from traditional Project Success Criteria (PSC) [22]. While traditional PSCs focus on issues such as time, cost, and quality, APSCs prioritize the ability to respond to change, ensure customer satisfaction, and deliver functional benefits throughout the project life cycle [23]. Scrum is an Agile framework that is specifically designed to provide structure and roles with the goal of organizing teamwork. The Product Owner, the Development Team, and the Scrum Master are the people that comprise the Scrum Team. The team is flexible in addition to being self-organized. Not only does this organization have all the knowledge required to complete the project, but it also makes all of the decisions related to it. Work cycles that are part of a Scrum framework include sprints, daily standups, and retrospectives. A project is split up into small sprints within the Scrum framework; these sprints can last anywhere from one to four weeks. Scrum, which is also one of the most popular agile methods [24], is a specialized framework that provides structure and roles for coordinating the activities of a team. A Scrum team includes a product owner, a development team, and a Scrum Master. In addition to being self-organized, the team is versatile. In addition to having all the knowledge required to complete the project, this organization is responsible for making all decisions regarding the project. Sprints, daily standups, and retrospectives are all examples of work cycles that the Scrum framework includes. Offering better communication and faster documentation, emphasizing structured collaboration, accountability, and proactive leadership, Scrum is in line with TCAM's focus on thinking and leadership. Another method that supports the idea of TCAM is the management methodology – Kanban. The Kanban system provides numerous benefits for business operations and management in an organization. According to the Kanban system, production is required only when there is a demand for the available products. With its visual workflow and resource management approach, it increases flexibility and supports efficient resource allocation – an important element in both the TCAM model and effective project management.

The aim and objectives of the study

This study seeks to explore and evaluate project management strategies that effectively blend the principles of the Time Competitive Advantage Model (TCAM) with Agile, Scrum, and Kanban methodologies to enhance the competitiveness and flexibility of Kazakhstani IT companies within the global market. The study combines theoretical analysis of the TCAM concept with practical data to gain a deeper understanding of local companies' approaches to team management, adaptation to change, innovation, and quality project delivery. Thus, the study aims to assess the contribution of ICT infrastructure and human resource development to the country's

overall competitiveness, as well as to identify key challenges that Kazakhstani IT companies face amid fast-paced technological change. By analyzing the application of TCAM and project management methodologies such as Agile, Scrum, and Kanban, the study aims to not only maintain companies' short-term adaptability, but also ensure their long-term growth. The study will conclude with a proposal for a project management model specifically tailored to the specifics of the Kazakhstani IT market, which will be aimed at increasing adaptability, implementing innovations and ensuring sustainable growth in the context of global competition.

Methodology

This research examines the project management techniques and experiences of leading project managers within Kazakhstan's IT sector, with a specific focus on team management, innovation, communication, and project success. The work will identify and evaluate existing project management practices by reviewing the literature and conducting an empirical analysis of successful companies with an emphasis on team management, creativity, communication, and project success. Thus, this study will include a study of the techniques and experiences of outstanding project managers in IT companies in Kazakhstan and an analysis of existing information on the topic of competitiveness. One of the main objectives will be to identify the critical aspects that increase the competitiveness of IT organizations in a quickly changing technological environment and provide optimal strategies for improving the effectiveness of project management. The main query underlying this study is: "What project management strategies are most effective in increasing the competitiveness and success of IT companies in Kazakhstan?"

Research Design

A mixed-method approach will be used to collect data, combining interviews with project managers and industry experts with surveys and data analysis to provide an in-depth perspective on effective project management tactics. These approaches provide additional perspectives on the topic. The interviews cover current practices, issues and strategies from IT professionals, identifying key trends, concepts and theories around corporate competitiveness and project management that are recognized worldwide.

Interviews

In order to analyze current project management practices and issues, it is necessary to collect sufficient information. Conducting interviews is an excellent option for this task. Interviews will be conducted with five experienced project managers from IT companies operating in Kazakhstan. The interview design will be fully structured, which will allow for an in-depth exploration of the relevant topic, while ensuring a certain sequence. The key topics of the interviews will be: the methodologies used, the results and quality of the released product, as well as adaptation to change and implementation of innovations within the team. The selection of project managers as interview participants was determined by their extensive experience in the field, which allowed them to provide useful insights into the current project management realities in Kazakhstani IT companies. This sample group was representative of various roles in IT companies, reflecting a wide range of strategies and competitive approaches.

Data Analysis

Based on the information collected during in-depth interviews with project managers, aimed at studying their experiences and management strategies, a qualitative data analysis will be conducted. At the qualitative analysis stage, the interviews will be transcribed and coded to identify key themes such as team management, innovation, adaptation to change, management methodologies and approaches to improving competitiveness. Thematic analysis based on coding

will reveal the main strategies that managers use to achieve success in the local market, as well as unique approaches adapted to Kazakhstani IT companies. By comparing the respondents' responses, both general trends and individual strategies will become visible, which will help to gain a deeper understanding of effective approaches to project management in Kazakhstan.

To conduct the data analysis, materials from the international journal Scopus and other articles on the topic of the study were also analyzed, focusing on popular concepts of traditional project management methods. The literature review will serve as a secondary research method, offering a theoretical basis for understanding competitiveness in the IT sector. A special focus will be given to identifying modern project management methodologies, recognized at the international level, that contribute to increasing competitiveness in the field of information technology.

Ethical considerations

Throughout the data collection process, ethical standards were a key priority. Participants were informed in advance about the objectives of the study, and their consent to participate was obtained before the interview. Confidentiality was maintained by anonymizing all responses, so no identifying information was included in the final analysis and report. Following the standards of research ethics, participants were encouraged to freely express their opinions, with the understanding that their ideas would be used for scientific purposes only. This methodological approach allows for a comprehensive examination of the competitive environment in the IT sector of Kazakhstan, combining theoretical and practical aspects.

Results and Discussion

To provide a full picture of how Kazakhstani IT companies cope with the complexities of the evolving global market, an interview was conducted. The interview was designed to delve deeper into key areas of project management. It involved five project managers of Kazakhstani IT companies that provide IT services not only to other businesses but also to government agencies. As for the interview itself, it was structured and consisted of 6 blocks of 3 questions each, a total of 18 questions on team recruitment and development, project planning and risk management, adaptation to technological changes, team motivation, communication methods and quality control. The results give a entire perspective of the strategies used to improve project management efficiency.

Most of the companies were founded more than 10 years ago, which demonstrates their success and focus on competitiveness, emphasizing the importance of a strategic and systematic approach to team recruitment and development. 3 out of 5 companies provide services to other businesses related to website and software development, the rest are engaged in the development of programs for the government. One of the most prominent themes from the interviews was the importance of a structured approach to recruiting and developing a team. In a common theme, most project managers emphasized that effective recruitment strategies should be tailored to the specific needs of projects, ensuring that candidates have the necessary technical skills and cultural fit. The combination of an HR manager and clear PM criteria helps to identify highly qualified candidates through various platforms such as HeadHunter, LinkedIn and GitHub. Companies value past experience and a portfolio of successful projects, often using multi-stage selection processes that include technical tasks and in-depth interviews with candidates, and some even include a probationary period to further assess the suitability of new employees for long-term collaboration. Project management practices, especially in the areas of planning and risk management, varied across companies, reflecting the diversity of projects they manage.

In interview results companies are referred as A, B, C, D, E. Company A uses tools such as JIRA and GitLab for documentation, ensuring comprehensive tracking from inception to delivery. Company B relies on weekly client briefings to align project deadlines and expectations, promoting transparency and consistent communication. Company C primarily uses Microsoft Project to

manage government contracts, following strict deadlines and budget controls. Companies D and E, meanwhile, have integrated Bitrix systems to communicate with employees and set goals. For example, Company D breaks each project into short sprints, allowing for quick adjustments and continuous feedback integration, while Company E uses a Kanban board within Bitrix to visualize task progress and optimize resource allocation. These approaches reflect each company's focus on structured planning and adaptive project execution. Of all the project management methods mentioned, Scrum is the most widely used, with four out of five companies actively using it. This framework, based on short sprints and regular meetings, helps maintain flexibility and improve communication within the team. In particular, Companies A and B hold regular retrospectives at the end of the project, where teams review the successes and failures of each sprint, which helps identify areas for improvement and make necessary adjustments as projects progress. Effective communication is therefore also vital to the success of IT projects, and managers shared a number of practices aimed at ensuring clear and transparent communication both within teams and with external stakeholders. Company A emphasizes the need for clear role definitions among stakeholders, holding weekly alignment meetings to ensure everyone is kept up to date with the latest project developments. Company B has implemented dedicated group chats to receive real-time updates from clients and cross-departmental teams, which facilitates streamlined communication. Company C's hybrid communication approach combines face-to-face collaboration for on-site team members with digital tools for remote participants. The use of digital collaboration tools such as Slack, Notion, and Telegram messenger were commonplace across the companies. Many managers also stressed the importance of clear channels for communicating with clients to ensure expectations are managed and feedback is included throughout the project lifecycle. These communication methods minimize the eliminate miscommunication and keep projects on schedule, even in distributed team environments. Quality control and project success measurement are rigorously implemented across all companies. Company A uses continuous testing and feedback loops to maintain quality standards, evaluating projects against key performance indicators (KPIs) tied to timelines and budgets. Company B focuses on customer satisfaction, measuring success based on customer feedback and ROI. Company C uses both internal KPIs and external benchmarks, especially for government projects where maintaining compliance standards is critical. Companies D and E rely on Agile metrics, including velocity and burndown rates, to monitor project quality throughout each development cycle. These metrics allow the companies to assess project performance and make data-driven adjustments as needed. Beyond this, team development is a common priority. A major focus of the interviews was the companies' ability to adapt to technological change and foster innovation. Managers agreed that in a rapidly evolving industry, it is important for teams to stay current with the latest technology trends. Even when joining a new team, an employee will learn new things. Three out of five companies support mentoring experiences, describing it as a key role in development. Experienced employees or team leaders act as mentors for less experienced colleagues, which allows for faster skill development and knowledge sharing. Also, the structure of these companies includes continuous training and professional development of permanent employees, encouraging them to learn new technologies and apply them to current projects. Companies A, C, E even agree to cover the costs of training if it is in line with the project goals and development directions. Company C emphasizes awareness of trends, which helps the team stay ahead in areas such as geographic information systems (GIS) and artificial intelligence, closely matching the requirements of its project. Also, Company A emphasizes time each quarter for experimentation, allowing teams to test new tools and methodologies such as artificial intelligence, machine learning, and blockchain technologies. Company D complements this with regular workshops and cross-functional training, which allows team members to gain insights from other departments. Taken together, these strategies demonstrate a commitment to facilitating both personal growth and team cohesion. This

forward-thinking approach ensures that teams are well-equipped to implement innovative solutions, keeping their companies competitive in the global IT marketplace, allowing employees to keep up with industry trends and expand their competencies, and strengthening the companies' ability to deliver on complex projects. Another theme of the interviews was effectively motivating and managing teams. Managers stressed the importance of creating a positive and supportive work environment where employees feel valued and motivated. Various strategies are used to maintain high levels of engagement, including performance bonuses, regular recognition of achievements, and opportunities for career development. Flexibility and autonomy were also noted as important motivators, with teams given the freedom to take ownership of their tasks and participate in decision-making processes. At the same time, C, D, E companies place particular emphasis on team culture, developing team cohesion and work-life balance, which contributes to a positive work environment. Thus, each company develops its own unique methods of maintaining morale, which ultimately contributes to increased team efficiency and successful completion of projects.

The table below provides a summary of the strengths and challenges identified in the participating companies, illustrating the overall focus on the project's effectiveness and competitiveness:

Area	Strengths	Challenges
Team Recruitment	Structured candidate profiling and multi-stage selection tailored to project needs	Limited access to a diverse talent pool
Team Development	Emphasis on continuous skills enhancement through mentorship, development goals, workshops, and hackathons	Occasional reliance on informal assessment methods
Project Management	Task management tools, structured planning, frequent alignment meetings	Inconsistent risk management practices across projects
Adaptation and Innovation	Proactive approaches to emerging technologies through training, workshops, and dedicated innovation time	Lack of a formalized innovation management framework
Team Motivation	Incentive structures, team autonomy, positive work culture, and professional development opportunities	Balancing motivation with effective stress management practices
Communication	Well-defined communication channels, regular updates, role clarity, hybrid approaches for distributed teams	Occasional miscommunication with external departments or clients

Interviews conducted with project managers of IT companies in Kazakhstan discovered a number of key findings that helped us better understand how project management works in this industry. In summary, the results of this study highlight the dynamic nature of project management in Kazakhstani IT companies, revealing a range of strategies used to improve competitiveness in both domestic and global markets. The integration of structured project management methodologies such as Agile, Scrum and Kanban demonstrates the ability of these companies to remain adaptive in an environment characterized by rapid technological change and changing customer

requirements. Furthermore, the interview findings highlight the importance of continuous development of both technical skills and leadership abilities as IT companies seek to maintain a competitive advantage by encouraging innovation and optimizing resource allocation. One of the key takeaways from the interviews was the role of project managers in promoting innovation and adaptability. The successful application of Agile and Scrum frameworks in several companies highlights the importance of iterative processes and flexibility in project planning. These approaches allow for rapid feedback adjustments, which is especially important in the IT industry, where project scopes often change briskly. Project managers must be able to not only effectively manage current projects, but also anticipate future changes and trends. This flexible mindset is closely related to the principles of the Temporal Competitive Advantage Model (TCAM), which emphasizes the constant reconfiguration and flexibility of resources to exploit new opportunities and maintain competitiveness. Applying TCAM in combination with Agile and Scrum can help project managers be more flexible and ready to respond instantly to changes, whether these are changes in customer requirements, the introduction of new technologies, or adjustments to business processes. For example, Kazakhstani IT companies that work with government agencies or large corporate clients should take into account that their competitive advantages, such as the ability to integrate new technologies or meet specific market requirements, may be temporary. Therefore, it is important to regularly review their project management strategies and methods. Kazakhstani IT companies following the TCAM model can make better use of these technologies, quickly develop new products and solutions, and adapt to market demands.

Conclusion

In conclusion, the competitiveness of IT companies in Kazakhstan is shaped by their ability to adapt to swift technological advances, effectively manage projects, and foster innovation. The integration of structured project management methodologies such as Agile, Scrum, and Kanban has enabled these companies to remain agile and respond quickly to changing global market demands. The Temporal Competitive Advantage Model (TCAM) plays an important role in supporting these methodologies as it emphasizes the importance of continuously reconfiguring resources, briskly adapting to new opportunities, and recognizing that competitive advantages are often temporary. Project managers play a key role in aligning IT project goals with broader strategic objectives, ensuring that projects not only meet deadlines and stay within budget, but also contribute to the long-term growth and sustainability of the company. Using frameworks such as Agile and Scrum, project managers create environments that support iterative development, rapid feedback cycles, and flexible project scope adjustments, which are essential for the fast-evolving IT sector. Kazakh IT companies have demonstrated a commitment to facilitating the growth of their employees by investing in mentoring programs, professional development opportunities, and experimenting with new technologies such as artificial intelligence, machine learning, and blockchain. This focus on skills development and innovation is critical to maintaining a competitive advantage as the global IT landscape continues to evolve quickly.

However, the study also highlights several challenges. The lack of a systematic approach to innovation management and difficulty parting with legacy or unprofitable projects were identified as areas for improvement. To fully realize the potential of TCAM, companies must implement more structured innovation management processes and regularly evaluate their project portfolios to ensure efficient resource allocation. This will not only improve short-term agility, but also promote long-term sustainability and growth. Overall, the combination of TCAM principles and modern project management methodologies provides a solid foundation for Kazakhstani IT companies to navigate the complexities of the global marketplace. As the country continues to invest in digital infrastructure and human capital, the role of project managers in driving these efforts will remain critical to the success of the IT sector. By prioritizing agility, innovation, and continuous

development, these companies are well positioned to improve their competitiveness and contribute to Kazakhstan's broader economic development.

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Pedagogical Sciences

ANALYSIS OF ORGANIZATIONAL CULTURE OF HIGHER EDUCATION INSTITUTIONS

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Abstract

Organizational culture in higher education institutions (HEIs) significantly influences institutional effectiveness, shaping academic and administrative processes. Despite extensive research on organizational culture, there remains a gap in understanding its unique impact within HEIs. This study aims to bridge this gap by examining how different cultural orientations—such as clan, adhocracy, and hierarchical cultures—affect key performance indicators like student engagement, faculty satisfaction, and adaptability. Using a mixed-methods approach, the research combines a systematic literature review (SLR) of recent studies from databases such as Scopus and IEEE Xplore with a survey of HEI students. Results reveal that clan cultures foster collaboration and satisfaction, adhocracy cultures enhance adaptability, and hierarchical cultures provide stability but may limit innovation. The findings suggest that HEIs could benefit from hybrid cultural models that balance collaboration, innovation, and stability to meet evolving educational demands. This study's insights underscore the importance of strategically managing organizational culture in HEIs to improve institutional performance and responsiveness. Future research should explore flexible cultural frameworks that align with the specific needs of HEIs, supporting both academic success and operational resilience.

Introduction

Organizational culture significantly influences behaviors, values, and practices within institutions, shaping decision-making processes and daily interactions. In the context of higher education institutions (HEIs), culture takes on a particularly important role by guiding the ways faculty, staff, and students engage with and respond to their institutional environment. Unlike other organizations, HEIs operate with a unique balance of academic freedom and structured administrative frameworks, creating dynamics that impact their mission and overall effectiveness. Understanding the nuances of organizational culture within HEIs is essential for grasping how these institutions function and adapt to both internal and external pressures.

Despite substantial research on organizational culture in various fields, there remains a gap in comprehensively examining how it specifically applies to HEIs. Current studies highlight some elements of academic organizational culture but lack a unified perspective on its unique challenges and advantages in this setting. Organizational culture in HEIs affects areas like student retention, faculty morale, and research productivity—key indicators of institutional performance. However,

these impacts have not been fully explored, creating an area for deeper investigation that this study aims to address.

This research undertakes a systematic literature review to organize and analyze existing studies on organizational culture in HEIs. By identifying prominent themes, trends, and areas of divergence, it seeks to clarify the influence of organizational culture on institutional outcomes. Through the synthesis of theoretical and empirical research, this study will also examine how cultural dynamics shape essential performance metrics, contributing to the broader academic and administrative success of HEIs.

This research seeks to fill a theoretical gap by offering a deeper analysis of organizational communication within higher education institutions (HEIs). By systematically reviewing the existing literature, it aims to examine the key challenges and advantages linked to organizational communication in these institutions.

Research Objectives

To analyze the existing literature on organizational culture within higher education institutions (HEIs): This objective aims to synthesize current research findings and identify key themes, trends, and gaps in the literature.

To assess the impact of organizational culture on institutional outcomes: This objective seeks to understand how organizational culture influences key performance indicators such as student retention, faculty satisfaction, and research productivity.

Subject and Object

The subject of this research is the organizational culture within higher education institutions.

The object of this paper is the literature that examines the organizational culture of higher education institutions, including theoretical frameworks, empirical studies, and methodological approaches.

Research Question

How does organizational culture within higher education institutions influence their academic and administrative processes?

The structure of this paper is as follows: it begins by outlining the theoretical framework for studying organizational culture, with a focus on models most applicable to HEIs. Following this, the methodology section explains the systematic review process used to collect and synthesize relevant studies. The findings and discussion sections present key themes, trends, and gaps in the literature, while the conclusion reflects on the implications of these findings for institutions and suggests for further research. Through this analysis, the study aims to provide a comprehensive overview of how organizational culture shapes academic and administrative processes within higher education, influencing both immediate operations and long-term institutional success.

Theoretical Framework

This systematic review is grounded in established organizational culture models and theories, which provide a structured foundation for examining the unique cultural dynamics within higher education institutions. Through established frameworks, this review elucidates how academic cultures are formed, sustained, and potentially modified to align with evolving educational and societal demands.

Organizational culture is broadly defined as the shared values, beliefs, and practices that shape the behavior of members within an organization. In higher education, this includes institutional values related to teaching, research, inclusivity, and governance [3]. It influences institutional success by shaping interactions among faculty, students, and administration, and impacting morale, productivity, and institutional reputation. Edward Tylor was the first to interpret culture through a sociological and anthropological lens. He described culture as "a complex whole," encompassing knowledge, beliefs, art, laws, morals, customs, and all other skills and practices that individuals develop as members of society (Tylor, 1974)[4].

Edgar H. Schein's definition of organizational culture is among the most widely recognized and is specifically tailored to explain culture within institutions. Schein describes culture as the collective set of assumptions a group has established over time in response to internal and external challenges (Schein, 1986) [5]. These assumptions, once proven effective, are then embraced as the "correct" way to perceive and address similar issues in the future. Consequently, they are transmitted to new members as foundational guidelines for thinking, understanding, and acting within the organization. Schein's model of organizational culture offers a comprehensive framework, depicting culture as a layered structure. The most visible layer comprises artifacts—observable symbols and behaviors, such as academic regalia, hierarchical titles, and enduring campus traditions—that embody an institution's cultural identity. Below this surface, espoused values represent the institution's guiding principles, often found in mission statements or codes of conduct, that shape behavior and inform decisions. At the core of the model are the basic underlying assumptions: deeply ingrained beliefs, such as the commitment to academic freedom and collegiality, that subtly but powerfully influence daily interactions and practices within the institution. This layered approach enables a nuanced understanding of how culture operates in higher education institutions, from visible symbols to deeply held values.

While research on culture in higher education is not new, the growing constituent demands for more accountability and proof of educational improvement have increased faculty, administrator, and policymaker interest in developing alternative frameworks for evaluating organizational performance.

Examining the organizational culture in higher education institutions is essential, as these institutions play a pivotal role in shaping the future workforce and intellectual discourse of a society (Reda, 2018) [6]. Researchers have explored the key components that define a culture within education institutes, such as leadership practices, communication patterns, decision-making processes, and the emphasis on student-centric approaches.

Existing research suggests that understanding organizational culture is crucial for administrators, educators, and students alike. A positive and harmonious culture can nurture intellectual growth, enhance the learning experience, and empower students to become responsible and engaged citizens. Strategies for creating and maintaining a positive organizational culture, adapting to changing dynamics, and leveraging the culture to achieve educational excellence have been the focus of various studies. (Sethi, 2023) [7]

Demissie and Egziabher (2022) [2] highlight how the cultural dynamics within institutions like Hawassa University directly influence stakeholder satisfaction and organizational performance. They emphasize the importance of aligning institutional culture with collaborative and innovative frameworks to meet stakeholders' expectations and foster academic growth. This alignment is essential not only for academic outcomes but also for the psychological well-being of those within the institution.

Similarly, a study focusing on vocational schools in Padang City, Indonesia [10], underscores the importance of trust, loyalty, and openness as essential factors in fostering an

effective educational culture. However, the researchers noted weaknesses, particularly in teacher loyalty and openness, which are crucial for supporting collaboration and professional development. These findings reaffirm the significance of leadership and culture in enhancing institutional efficiency and creating a conducive academic environment.

In their case study of Plekhanov Russian University of Economics (PRUE), Vasyakin et al. (2016) [8] examined the predominant hierarchical culture in Russian higher education. Although rigid structures are beneficial for operational control, they can hinder innovation and student engagement. The study emphasizes that flexibility and increased faculty-student participation in cultural formation are critical for promoting creativity and cooperation. A similar issue was identified at Alexandru Ioan Cuza University in Romania, where Warter (2019) [12] found that a means-oriented governance focused on external goals, such as financial results, limits internal innovation and collaboration.

The need for cultural transformation is further illustrated by Coman and Bonciu's (2016) [1] comparative analysis of Harvard University and the University of Bucharest. Harvard's decentralized governance model fosters autonomy and innovation, enabling faculty to independently design courses and conduct research. In contrast, the University of Bucharest is hampered by bureaucracy, limiting faculty participation in decision-making and stifling academic innovation. This comparison highlights the importance of adaptive governance and cultural alignment with institutional goals to promote academic excellence.

The COVID-19 pandemic presented significant challenges for HEIs, requiring them to adapt their cultural practices to support students and faculty during uncertain times. Al-Farabi Kazakh National University (KazNU) provides a good example of how a well-established organizational culture can foster resilience during crises. As Belyalova and Chun (2020) [11] noted, KazNU implemented instant messaging platforms and a 24/7 call center to offer psychological support and maintain communication between students and staff during the transition to distance learning. These strategies underscore the importance of empathy, open communication, and support services as essential components of effective educational management during disruptive periods.

However, the pandemic also exposed challenges such as the digital divide, as many students lacked access to the necessary technology. This highlighted the need for equity-focused initiatives to be integrated into the organizational culture to ensure that all students, regardless of their circumstances, can participate and succeed. The experience emphasizes the importance of cultural adaptability in preparing HEIs for future uncertainties.

Several studies have noted that hierarchical structures and conventional governance models hinder innovation in HEIs. Traditional cultures characterized by tight controls and rigid operational frameworks limit faculty collaboration and suppress student creativity. Vasyakin et al. (2016) [8] argue that HEIs need to move away from rigid hierarchies toward more flexible and inclusive cultures, fostering a sense of belonging and psychological well-being among students and faculty.

Leadership is crucial for cultural transformation. Studies suggest that trust-building measures, such as open communication, symbolic acts, and participative governance, can drive positive cultural change. Effective leaders can promote collaboration and motivate faculty by aligning institutional values with individual aspirations. In the study of Indonesian vocational schools, the researchers found that school principals significantly influenced teacher motivation through their leadership practices, illustrating the important role leadership plays in shaping academic culture.

The literature emphasizes the need for HEIs to adopt adaptive governance models and foster collaborative, inclusive cultures to meet the challenges of a rapidly changing educational landscape. Institutions like Harvard University demonstrate that decentralized governance and

autonomy can promote innovation and academic freedom. On the other hand, universities like Plekhanov Russian University and Alexandru Ioan Cuza University illustrate the difficulties of transitioning from hierarchical frameworks to more flexible cultural models.

The COVID-19 pandemic has reinforced the importance of resilience and adaptability in HEIs. Open communication, support services, and equitable access to resources are critical for creating a supportive learning environment during crises. Future research should focus on developing strategies for cultural transformation that align institutional goals with the psychological and academic needs of all stakeholders.

By adopting innovative cultural practices and fostering leadership that prioritizes trust and transparency, HEIs can enhance institutional performance, boost faculty engagement, and promote student success. These strategies will position higher education institutions to thrive in the evolving educational environment and address the complexities of the modern world.

Methodology

This study employed a mixed-methods approach, combining a systematic literature review and survey-based analysis to investigate the organizational culture within higher education institutions (HEIs). This approach allowed for a theoretical foundation through the literature review and empirical insights gathered from stakeholders in HEIs through the survey.

Systematic Literature Review

A systematic literature review (SLR) is a research method used to compile and synthesize existing studies on a specific topic. This approach follows a structured process that includes identifying, evaluating, and integrating relevant research to provide a thorough overview of the current knowledge in the field. Unlike traditional narrative reviews, the SLR methodology emphasizes transparency, replicability, and objectivity. The main steps involved in conducting an SLR are formulating research questions, creating a search strategy, selecting studies according to established criteria, and critically assessing the chosen studies. By adhering to this systematic approach, the review aims to be comprehensive and impartial, ultimately enhancing the credibility of the results.

To accomplish the main objective and tackle the research problem, the study set out the following specific objectives: (i) to carry out a systematic literature review to identify and analyze research on organizational culture within higher education institutions; (ii) to categorize the benefits that organizational culture brings to these institutions; and (iii) to organize the challenges that higher education institutions encounter in relation to their organizational culture.

The systematic literature review focused on locating and analyzing studies through keywords such as “organizational culture” and “higher education institutions” combined to find relevant research. The main objective was to organize academic publications and pinpoint specific topics related to organizational culture in HEIs. Searches were conducted in prominent databases like Scopus and IEEE Xplore, known for their extensive resources in management and business, to collect studies on organizational communication within HEIs.

The selection process for studies was guided by well-defined inclusion criteria to ensure relevance and quality of the reviewed literature. First, studies were included only if they focused on the analysis of organizational culture specifically within higher education institutions, allowing for a concentrated examination of cultural dynamics in this unique context. Second, only articles and conference proceedings published within the last five years (2019–2024) were considered, ensuring that the review captured current research trends, recent findings, and contemporary perspectives in a rapidly evolving educational environment. Additionally, the search targeted specific academic disciplines, with a primary focus on fields such as business and management, to align with established theories and frameworks commonly used in organizational culture research. Finally, each study underwent a careful evaluation of its title, abstract, and results, enabling a

thorough assessment of its relevance and contribution to understanding organizational culture in higher education institutions. These criteria collectively supported a comprehensive and up-to-date overview of the existing literature on the topic.

Survey

To complement the literature review, a survey was administered via Google Forms, targeting faculty members, administrative staff, and students at various HEIs. The survey aimed to capture perceptions related to key aspects of organizational culture, including governance structure, support for innovation, communication channels, collaboration, and professional development. Responses were anonymized to maintain confidentiality and analyzed using descriptive statistics, while qualitative feedback was coded thematically to extract trends relevant to organizational culture in HEIs.

This survey provided an empirical foundation for evaluating institutional dynamics and offered insights into areas where organizational culture positively influences or, conversely, restricts institutional outcomes.

Findings

Literature Review Results

Database	1 Criteria	2 Criteria	3 Criteria	4 Criteria	Reviewed
Scopus	318	163	53	11	9
IEEE Xplore	94	49	40	3	2

Table 1

The systematic literature review focused on identifying and analyzing research related to organizational culture within higher education institutions (HEIs). Using Scopus and IEEE Xplore as primary databases, the review followed a structured process, applying specific inclusion criteria to refine the selection of relevant studies. Each criterion was designed to ensure that only high-quality, recent, and discipline-specific research was considered, resulting in a focused collection of studies that address the unique cultural dynamics within HEIs.

Database Results

The initial search in Scopus yielded 318 studies, which were subsequently narrowed down based on the inclusion criteria. Of these, 163 studies were identified as focusing on HEI organizational culture. Further refinement based on publication date (2019–2024) reduced this number to 53, with only 11 fitting within the target disciplines of business and management. After evaluating titles, abstracts, and results, a final selection of 9 studies met all inclusion criteria for in-depth review.

In IEEE Xplore, the initial search identified 94 studies. Applying the same inclusion criteria, the selection was narrowed to 49 studies focused on HEI organizational culture, with 40 published in the past five years. Three studies were categorized under business and management disciplines, and ultimately, 2 studies satisfied all criteria for full review.

Key Themes in Organizational Culture within HEIs

Collaboration and Knowledge Sharing

A dominant theme identified across six studies was the emphasis on collaboration and knowledge sharing within HEIs that maintain clan-oriented cultures. These studies indicate that a culture emphasizing community, trust, and mutual support enhances faculty and student engagement and promotes knowledge sharing across departments. For instance, Adeinat and Abdulfatah highlight that clan cultures foster an environment where interdisciplinary collaboration

flourishes, which is crucial for academic innovation and holistic curriculum development. This supportive cultural framework has been linked to higher satisfaction and increased engagement among faculty and students alike [9].

Adaptability and Innovation

Seven studies underscore the significance of adaptability and innovation in HEIs that adopt an adhocracy culture, which emphasizes flexibility, risk-taking, and innovation. Such institutions demonstrate resilience and a proactive stance toward evolving educational needs, particularly in response to technological changes. For instance, studies by Carvalho & Sampaio (2022) and Belyalova & Chun (2020) found that institutions with adhocracy cultures were more effective in adapting to the demands of remote learning during the COVID-19 pandemic. This theme highlights the role of flexible cultures in enabling institutions to experiment with new pedagogical methods and respond rapidly to external pressures [10][11].

Faculty and Student Satisfaction

Faculty and student satisfaction was a recurring theme in five studies, with clan cultures consistently associated with positive outcomes in this area. Studies reveal that HEIs with clan-oriented cultures foster a supportive, family-like atmosphere that meets the interpersonal needs of faculty and students. This supportive environment has been shown to positively impact student retention and faculty commitment, as reported in studies by Caliskan & Zhu (2019) and Warter (2019). These studies note that the emphasis on teamwork, mentoring, and community in clan cultures aligns well with the needs of students and staff in educational settings, creating a conducive environment for academic and professional growth [12][13].

Structural Stability and Efficiency

The emphasis on structural stability and efficiency emerged as a theme in four studies, particularly within larger, public universities that favor hierarchical cultures. These institutions benefit from a stable structure, with formal procedures that contribute to administrative consistency and predictability in academic functions. However, these studies also highlight the challenges posed by rigid structures in hierarchical cultures, which may limit innovation and responsiveness. For instance, research by Cieciora et al. (2021) indicates that although hierarchical cultures provide stability, they can inhibit the autonomy and flexibility needed to explore new academic approaches [13].

Benefits of Organizational Culture in HEIs

The SLR identified several benefits associated with specific organizational cultures within HEIs, with clan and adhocracy cultures often yielding positive outcomes:

- *Enhanced Institutional Performance*: Six studies highlight that HEIs with strong, cohesive cultures—especially those emphasizing collaboration and adaptability—show improved performance metrics, such as increased research output and student retention. Studies like those by Hung, Su, & Lou (2022) demonstrate that alignment between institutional objectives and cultural values fosters an environment that promotes academic and professional success [14].
- *Effective Knowledge Management*: Adhocracy and clan cultures positively influence knowledge-sharing practices, which are essential for continuous learning and interdisciplinary research. Five studies, including those by Djangone & El-Gayar (2021) and Carvalho & Sampaio (2022), indicate that HEIs with open communication and collaborative environments are more adept at managing knowledge, enhancing institutional agility and supporting innovation [15][10].
- *Higher Satisfaction and Engagement*: Studies found that HEIs with clan-oriented cultures exhibit high satisfaction and engagement rates among faculty and students, as this type of culture supports teamwork, community, and mentorship. Clan cultures in HEIs contribute

to lower turnover rates and higher levels of engagement, as observed by Caliskan & Zhu (2019) and Cieciora et al. (2021) [12][13].

Challenges of Organizational Culture in HEIs

While the benefits are notable, the literature also highlights specific challenges associated with organizational culture in HEIs. Three main challenges emerged:

- *Resistance to Change in Hierarchical Cultures:* Four studies, including Cieciora et al. (2021), discuss the limitations of hierarchical cultures in adapting to rapid technological and pedagogical changes. Rigid structures within these cultures can hinder innovation and responsiveness, making it difficult for HEIs to adopt new methods and approaches. This resistance to change may result in lower engagement levels, especially among faculty who prefer a degree of autonomy [13].
- *Cultural Misalignment across Disciplines:* Five studies identify challenges associated with cultural misalignment within HEIs, particularly in institutions offering diverse academic disciplines. Discrepancies arise as different departments may require distinct cultural orientations. For instance, departments that focus on creative fields may thrive in an adhocracy culture, while fields with stringent regulatory requirements, such as medical training, may benefit from hierarchical stability [13].
- *Cross-Cultural Challenges in International HEIs:* In HEIs with international campuses or diverse student bodies, cross-cultural differences present a significant challenge. Two studies, including Hung et al. (2022), reveal that national culture influences perceptions of organizational norms, which can impact how faculty and students interact within the institution. Effective management of these differences requires HEIs to adapt practices that align with local cultural norms, which may complicate efforts to maintain a cohesive institutional culture [14].

Survey Results

The survey findings provide a comprehensive view of organizational culture as perceived by stakeholders within higher education institutions (HEIs). These results reveal both supportive elements and limitations, particularly in areas such as governance structure, collaboration, communication, support systems, and professional development.

Support for Innovation and Flexibility

A notable proportion of respondents indicated that their institution's culture promotes innovation and flexibility. Specifically, 38 respondents (42.53%) agreed, and 8 respondents (9.2%) strongly agreed that their institution supports innovative practices. However, 12 respondents (13.8%) each expressed disagreement and strong disagreement, indicating that while a majority perceive a degree of openness to innovation, approximately 28% feel that structural limitations exist. This reflects a potential need for balancing institutional structure with flexibility to foster an environment more conducive to innovation.

Governance Structure and Collaboration

The data revealed a predominance of centralized governance structures within HEIs, with 32 respondents (36.78%) identifying their institution's governance as centralized. Only 15 respondents (17.24%) described their institution as decentralized, and 28 respondents (32.18%) identified a mixed governance model. This distribution underscores a tendency toward centralized control, which may limit collaborative potential and restrict inclusive governance practices. In terms of collaboration, 27 respondents (30%) indicated that collaboration is encouraged to a great extent or completely, while 42 respondents (47%) felt that collaboration was only somewhat or minimally encouraged. This suggests that adopting more inclusive governance models could enhance institutional cohesion and facilitate cross-departmental engagement.

Communication and Support Systems

Satisfaction with communication channels between students, faculty, and administration varied among respondents. While 45 respondents (50%) expressed satisfaction or strong satisfaction with the communication systems, 24 respondents (26.7%) reported dissatisfaction, and 18 respondents (20%) remained neutral. This distribution indicates a need for more effective communication channels to bridge potential gaps between institutional leadership and stakeholders. Additionally, encouragement to seek academic or personal support was inconsistent; while 22 respondents (24.5%) felt often encouraged and 11 (12.3%) felt always encouraged, a significant portion—29 respondents (32%)—rarely or never felt encouraged to utilize these support systems. This finding suggests that current support structures may require increased accessibility and visibility to better meet the needs of all institutional members.

Professional Development and Engagement

The survey results revealed mixed levels of satisfaction with professional development opportunities. Thirty-four respondents (37.8%) reported satisfaction, and 10 (11.5%) expressed strong satisfaction. However, 18 respondents (20%) reported dissatisfaction, and 25 respondents (27.8%) remained neutral regarding professional development opportunities. This limited satisfaction with professional development could potentially affect faculty motivation and engagement, impacting overall institutional performance.

Additionally, perceptions of student engagement varied. While 30 respondents (33.3%) described students as very engaged, 27 respondents (30%) perceived them as only somewhat engaged, and 14 respondents (15.6%) viewed students as only slightly or not at all engaged. This variation in perceived engagement levels may indicate inconsistencies in how organizational culture supports active participation in academic activities, suggesting that enhancing support systems could improve student engagement and learning outcomes.

Discussion

Literature Review

The findings from this systematic literature review (SLR) provide a nuanced understanding of the role of organizational culture in shaping the operational dynamics, adaptability, and success of higher education institutions (HEIs). This section interprets the key findings, highlighting the significance of each identified theme, discussing the benefits and challenges associated with different cultural types, and exploring the broader implications of organizational culture within HEIs. The discussion also considers gaps in the literature and suggests directions for future research.

Collaboration and Knowledge Sharing in Clan Cultures

The theme of collaboration and knowledge sharing emerged as a central component in HEIs with clan-oriented cultures, where mutual support, community, and trust foster a cohesive environment. The reviewed studies demonstrate that clan cultures encourage open communication and create an atmosphere where faculty and students feel supported, which is conducive to knowledge sharing and interdisciplinary collaboration. This supportive framework aligns well with the mission of HEIs to facilitate knowledge generation and dissemination, suggesting that clan-oriented practices can effectively enhance faculty and student engagement.

However, while clan cultures promote collaboration, they may also face challenges in competitive and performance-driven academic environments. For instance, the focus on community and mutual support might conflict with the performance metrics often required for institutional success, such as research output and funding acquisition. HEIs may need to find a balance between fostering a clan culture that emphasizes collaboration and implementing performance-oriented practices that ensure competitiveness and academic excellence. This

balance is essential for institutions seeking to achieve both a supportive work environment and high academic performance.

Adaptability and Innovation in Adhocracy Cultures

Adhocracy cultures, which prioritize flexibility, risk-taking, and innovation, offer significant advantages for HEIs, particularly in adapting to technological changes and evolving educational demands. The studies highlight the benefits of an adhocracy culture, as institutions with this orientation demonstrated resilience and adaptability in response to the sudden shift to remote learning during the COVID-19 pandemic [10][11]. This adaptability is crucial for HEIs operating in a rapidly changing landscape, where digital transformation and shifting student expectations require constant innovation.

While the flexibility of adhocracy cultures supports innovation, such an environment may pose challenges in traditional or highly structured institutions, particularly those with established hierarchical frameworks. Adopting an adhocracy culture may create friction in these settings, as faculty and administrators accustomed to formal structures may resist the shift toward a more dynamic, risk-oriented approach. Therefore, while adhocracy cultures hold potential for enhancing adaptability, HEIs should consider the feasibility of implementing these practices within their existing structural frameworks. Blending adhocracy elements with the stability of hierarchical practices may offer a practical solution for traditional HEIs seeking to increase their adaptability without compromising their established order.

Faculty and Student Satisfaction in Clan Cultures

The review reveals that faculty and student satisfaction is closely linked to clan cultures, which foster a family-like environment that supports interpersonal and professional growth. Researches suggests that clan cultures create a sense of belonging, which has a positive impact on both student retention and faculty commitment [12][13]. In HEIs, where engagement and retention are vital for institutional stability, clan-oriented practices that prioritize teamwork, mentoring, and community can contribute significantly to creating a positive academic and professional atmosphere.

However, the implementation of clan cultures in HEIs, particularly larger or public institutions, can be challenging. Clan cultures thrive in smaller, more intimate settings, whereas large institutions with formalized processes may struggle to replicate the close-knit, supportive environment characteristic of clan cultures. Financial constraints and resource limitations may also impact the ability of large HEIs to foster the level of support and mentorship integral to clan cultures. Consequently, while clan cultures can enhance satisfaction, HEIs must adapt these practices according to institutional size, resources, and organizational structure to effectively meet the needs of faculty and students.

Structural Stability and Efficiency in Hierarchical Cultures

Hierarchical cultures, which emphasize stability, consistency, and formal procedures, provide structural stability and administrative efficiency in HEIs, particularly in larger institutions. The reviewed studies suggest that hierarchical cultures help ensure order and consistency in administrative and academic functions, benefiting HEIs that require stable, predictable processes.

Despite these benefits, hierarchical cultures may limit innovation and adaptability, as their emphasis on control and order can restrict the flexibility needed to respond to rapid technological or educational changes. This rigidity can be particularly problematic in contemporary HEIs, where flexibility and responsiveness are increasingly essential for competitive advantage. The findings suggest that while hierarchical cultures provide valuable stability, HEIs may benefit from integrating elements of flexibility, particularly within academic departments that require a more dynamic approach. A balanced cultural approach that combines the stability of hierarchical structures with the innovation-oriented practices of adhocracy cultures could enable HEIs to achieve both administrative efficiency and academic adaptability.

Benefits and Challenges of Organizational Culture in HEIs

The findings highlight the transformative potential of organizational culture in HEIs, as well as the specific challenges that different cultural types may encounter:

- *Enhanced Institutional Performance:* HEIs with strong, cohesive cultures—especially those combining clan and adhocracy elements—report higher performance metrics, including improved research output and student retention. These findings suggest that alignment between organizational values and institutional objectives is critical for enhancing academic success and stakeholder satisfaction. Clan and adhocracy cultures, in particular, appear well-suited to fostering an environment that balances collaboration with innovation, thus supporting institutional performance.
- *Effective Knowledge Management:* Knowledge sharing is a cornerstone of academic institutions, and both clan and adhocracy cultures are conducive to open communication and collaborative learning. These cultural types support knowledge dissemination and interdisciplinary research, enhancing HEIs' capacity for innovation and agility. However, HEIs may face challenges in implementing these cultures across different departments, as certain disciplines may require specific structural approaches to meet their unique knowledge management needs.
- *Resistance to Change:* Hierarchical cultures are often resistant to rapid technological and pedagogical changes, limiting their adaptability. This resistance can be challenging for HEIs that need to remain agile in the face of emerging educational demands and technological advancements. The findings indicate that integrating flexibility within hierarchical structures may help HEIs address this challenge, promoting a culture of innovation without sacrificing the stability and predictability offered by formalized processes.
- *Cross-Cultural and Disciplinary Challenges*: HEIs are diverse institutions where cultural misalignment can occur across academic disciplines or in international contexts. Certain disciplines may benefit from a more innovative, risk-taking adhocracy culture, while others, particularly those with regulatory requirements (e.g., medical and technical fields), may require the stability of a hierarchical culture. Moreover, HEIs with international campuses face the challenge of adapting to local cultural norms while maintaining a cohesive institutional identity. Addressing these cross-cultural and disciplinary discrepancies requires HEIs to implement adaptive cultural practices that respect both local values and institutional integrity.

Survey

The survey findings offer insightful perspectives on the organizational culture within higher education institutions (HEIs) from the viewpoint of various stakeholders, revealing both strengths and areas for improvement. This section interprets the results in relation to organizational culture literature and their implications for HEIs, focusing on support for innovation, governance structure, collaboration, communication, support systems, and professional development.

The survey results indicate:

1. A general support for innovation and flexibility in HEIs, though with notable structural limitations.
2. A predominance of centralized governance structures, which may inhibit collaborative potential.
3. Mixed levels of satisfaction with communication channels and support systems, suggesting potential disconnects.
4. Limited satisfaction with professional development opportunities, which could affect faculty engagement and institutional loyalty.

5. Variability in perceived student engagement, hinting at inconsistencies in fostering active participation.

The survey reveals that while a majority of stakeholders see some support for innovation and flexibility within HEIs, structural limitations persist. This duality suggests a tension between institutional goals to encourage adaptability and the established systems that may hinder these aspirations. Institutions that are too rigid in their governance and policies may stifle innovative initiatives, which can prevent faculty, staff, and students from exploring new methodologies or technologies. Addressing this balance between structure and flexibility could enable HEIs to create a culture that truly supports innovation.

The predominance of centralized governance structures identified in the survey reflects a common organizational trend in HEIs, where hierarchical systems are often implemented for efficiency and control. However, the relatively low levels of reported collaboration suggest that such models may limit cross-departmental engagement. Research in organizational culture supports the idea that collaborative environments enhance problem-solving and innovation. HEIs may need to explore mixed or decentralized governance models that empower departments to work together, fostering a more cohesive and cooperative culture.

The mixed satisfaction with communication and support systems indicates potential communication gaps that might affect how effectively institutional goals and values are shared. Effective communication is fundamental in aligning faculty, student, and administrative efforts. The dissatisfaction expressed by some respondents suggests that current systems may lack transparency or accessibility. HEIs could benefit from implementing more open and streamlined communication channels, ensuring that all stakeholders are informed and feel connected to institutional initiatives.

Support systems, another key aspect of organizational culture, appear to lack visibility and accessibility, with a third of respondents feeling rarely or never encouraged to seek academic or personal support. This gap in support reflects a potential shortcoming in how HEIs promote resources that can aid in both academic and personal challenges. To address this, institutions should consider enhancing the promotion of support services and ensuring they are readily accessible, which could contribute to a more inclusive and supportive culture.

The limited satisfaction with professional development opportunities reported in the survey is concerning, as professional growth is vital for faculty engagement and institutional loyalty. Without sufficient opportunities for development, faculty members may struggle to feel valued and motivated, which could impact teaching quality and research productivity. To address this, HEIs might consider expanding their professional development programs to include a wider range of skills and career advancement opportunities, ensuring that these programs are accessible and relevant to faculty needs.

The varied perceptions of student engagement suggest inconsistencies in how HEIs support active participation. While some respondents view students as highly engaged, others see only moderate or low engagement levels. This discrepancy may reflect a lack of consistent cultural support for student involvement in academic and extracurricular activities. Active student engagement is closely linked to learning outcomes, and improving this aspect of organizational culture could enhance the overall educational experience.

Implications of Findings

These findings underscore the importance of fostering a balanced and adaptable organizational culture in HEIs. A flexible culture that values innovation without sacrificing necessary structure is essential for supporting the complex needs of modern academic institutions. The predominance of centralized governance models suggests that HEIs could benefit from exploring more inclusive and collaborative governance structures, which could enhance cross-departmental engagement and foster a sense of shared purpose across the institution.

The mixed responses regarding communication and support systems highlight the need for HEIs to improve these areas to ensure that all stakeholders feel connected and supported. Transparent communication channels and accessible support services can create a more open and inclusive environment, where individuals feel valued and have the resources they need to succeed.

Professional development, as reflected in the survey, remains an area where HEIs need to invest more strategically. Well-designed development programs that address the diverse needs of faculty and staff not only contribute to personal growth but also enhance institutional loyalty, improving overall productivity and satisfaction.

Conclusion

The findings of this systematic literature review reveal that organizational culture profoundly influences both the academic and administrative processes within higher education institutions (HEIs), impacting key performance indicators such as faculty satisfaction, student engagement, adaptability, and overall institutional effectiveness. This study successfully addressed the gap in literature by synthesizing current research on how specific cultural types—such as clan, adhocracy, and hierarchical cultures—shape the functionality and outcomes of HEIs.

At a higher level, the most important outcome of this work is the identification of the nuanced relationship between organizational culture types and institutional objectives. Clan cultures, for instance, excel at fostering collaboration and satisfaction but may not align with highly competitive or output-driven institutional goals. Adhocracy cultures, while promoting adaptability and innovation essential for a dynamic academic landscape, can clash with the stability required in traditional HEIs. Hierarchical cultures provide structural stability and administrative efficiency, but at the expense of flexibility and responsiveness, often stifling innovation and adaptability. This outcome underscores the critical need for HEIs to balance these cultural characteristics rather than adopting any single cultural approach universally.

The significance of these findings lies in their implications for HEIs that seek to remain competitive in a rapidly evolving educational environment. The results suggest that HEIs should consider implementing hybrid or adaptable cultural models that combine the collaborative strengths of clan cultures, the innovative agility of adhocracy, and the stability of hierarchical systems. Such a tailored cultural approach can enable HEIs to achieve both high-performance and a supportive, inclusive environment, allowing institutions to meet diverse stakeholder needs effectively.

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Applying the 7E model in teaching "class Arachnida" topic

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The aim of the constructivist approach is to ensure that the student acquires knowledge and develops in the mind by actively participating, implementing and experimenting. The 7E approach is a comprehensive learning model incorporating various methods such as cooperative learning, group work, lectures, laboratory research and direct instruction.
Substandard: 1.1.2. Interprets considerations about the diversity of living things.

Learning conclusion: Interprets statements about the diversity and structure of arachnids.
Evaluation Criterion: Interprets considerations about the diversity and structure of arachnids.
Evaluation method: methods used to monitor student progress: exit ticket, brainstorming, auction.

Brief description of the course of the lesson

The aim of the memorization phase is to determine what students know about the topic to be taught.
What are the features of arthropods?
What representatives of arthropods do we know?
What distinguishes arachnids from other arthropods?
Questions are asked to stimulate interest on the topic. Students are asked the following questions and involved to discuss.
• Which movie are you watching the images (footage) from?
• What features of arachnids do we see more clearly in this movie?
• Where are arachnids found?
• Why are some people afraid of arachnids? What could be the reason for this?
At the end of this stage, the aim of the lesson is stated to the students.
In the study phase of the lesson, students participate in activities.
Activity "External structure of the cross spider (Araneus diadematus)"
The progress of the work:
i1. Observe cross spider (Araneus diadematus) or its pictures. Define the head, chest and abdomen parts of the body.
2. Pay attention to the structure and location of the surroundings. Determine their number.
• What are the similarities and differences between cross spider (Araneus diadematus) and crayfish (Astacus)?
At the explanatory stage of the lesson, students are informed:
• Life activity of arachnids
• Diversity of arachnids
At the deepening stage of the lesson, students deepen and expand their understanding of class Arachnida through tasks. 1. What are the characteristic features of the cross spider?
1) Venom glands are located at the end of the abdomen. 2) Trachea and lungs are involved in respiration. 3) Primary digestive process occures outside the body. 4) Breathes only with trachea. 5) There are 3 pairs of net-casting in the abdominal part. 6) There are 4 pairs of simple eyes on the head. 7) 1 pair of green glands are involved in excretion. 8) It has complex (compound) faceted

eyes. 9) The body is covered with chitin. 10) It is hermaphroditic. 11) There is a mouth apparatus called pedipalp. 12) The blood-vascular system is closed.
Complete the table:

The name of the group	General signs	Representatives

At the end of the lesson, an auction is held by asking the question "what are the main features of spiders (arachnids)?" Exit ticket method is applied during reflection. At the improvement stage, students are given the task of preparing a presentation on the topic "diversity of spiders (arachnids)".

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Application of the 7E model to "Pillars of Our Body" topic

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The topic "Pillars of our body" is taught in the 8th grade. The teacher first focuses on realizing the sub-standard. Then defines the learning objectives pursuant to the standard. The course of the entire lesson, the learning strategies are based on standard and non-standard objectives.

Substandard(s): 1.1.3. Conducts experiments to study the structure of living things and explains the conclusions.

2.1.3. Conducts experiments and mathematical calculations on biological processes in the human body and summarizes the conclusions.

Topic: Pillars of our body

Learning conclusion(s):

- Conducts experiments to study the structure of the bones composing the human body and explains the conclusions.
- Conducts mathematical calculations on the composition of bone tissue in the human body and summarizes the conclusions.

Evaluation criteria:

- Conducts experiments to study the structure of the bones composing the human body and justifies the conclusions.
- Conducts mathematical calculations on the composition of bone tissue in the human body and determines the conclusions.

Evaluation method: question-answer, exit ticket, observation.

Brief description of the course of the lesson

The aim of the memorization stage is to determine what students know about the topic to be taught.

- In your opinion, what would humans look like without skeletons?
- What parts does the skeleton consist of?

At the stage of involvement, interesting information is told and questions are asked pursuant to it to stimulate interest in the topic.

During archaeological excavations, many different bone remains were found. Paleontologists determined whether these bones belong to animals or humans.

- For you, what determines whether the bones are human or animal or their age?

After the stage of involvement, the aim of the lesson is stated to the students.

- Conducts experiments to study the structure of the bones composing the human body and explains the conclusions.
- Conducts mathematical calculations on the composition of bone tissue in the human body and summarizes the conclusions.

The experiment is conducted at the research stage.

Equipment: three chicken femurs (normal, burned and kept in 10% hydrochloric acid for a day).

The progress of the work.

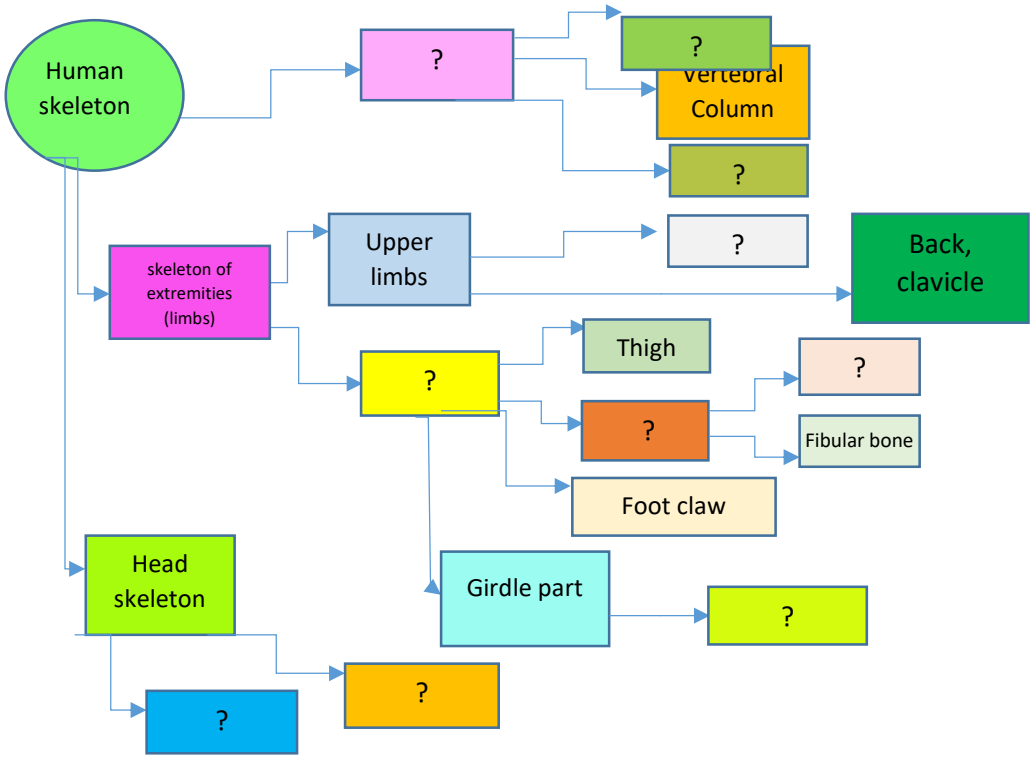
1. Try to bend the femur normally. Is this possible? But how to stretch and lengthen that bone, is it possible?

2. What is the characteristic of bone burn? What happens when you try to bend it?
3. Now check the features of the bone immersed in hydrochloric acid. Explain why this bone can be bent. Compare the conclusions of the experiments.

At the explanation stage, the topic is explained via pictures, presentations, etc. The main mass of the bones composing the human skeleton consists of bone tissue covered with ossification. Bone tissue is a type of connective tissue. It consists of intercellular substance and bone cells. Protruding bone cells constitute 1/3 of the tissue. Bone contains both organic and inorganic substances.

At the deepening stage, students are given tasks, and their knowledge about the subject is expanded.

Complete the scheme.



Exit ticket method is applied during reflection. The strategy is determined to meet the needs of the students in the next lesson by analyzing the answers. At the improvement stage, students are given the task of making a model of the skeleton.

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Cultural Awareness in English Language Teaching: Developing an Inclusive Approach in Multinational Classrooms

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Abstract: This article explores the significance of cultural awareness in teaching English as a Foreign Language (TEFL), particularly focusing on how incorporating cultural elements from students' backgrounds enhances the learning experience. It highlights the influences of Chinese and Japanese cultures on language acquisition and communication styles, proposing practical strategies for educators to foster a culturally responsive classroom. The findings suggest that a deeper understanding of cultural nuances not only aids in language learning but also promotes global citizenship among students.
Keywords: Cultural Awareness, TEFL, English Language Teaching, Chinese Culture, Japanese Culture, Language Acquisition, Pedagogy, Global Citizenship.

Topicality: In an increasingly interconnected world, the need for cultural awareness in education has never been more pressing. As English becomes the global lingua franca, understanding the cultural contexts of learners from diverse backgrounds is essential for effective teaching. This article addresses the relevance of cultural sensitivity in TEFL and its impact on student engagement and success.
Purpose of the Article is to analyze the role of cultural awareness in teaching English as a Foreign Language, with a particular emphasis on the cultural influences of China and Japan. It aims to provide educators with insights and strategies for integrating cultural elements into their teaching practices, thereby enhancing the learning experience for students.
Results and Their Discussion: The research indicates that students from diverse cultural backgrounds bring unique perspectives to the learning environment, influencing their engagement and interaction. By recognizing and incorporating elements of Chinese and Japanese cultures, educators can create more inclusive and effective learning experiences. The discussion highlights specific examples of how cultural practices, communication styles, and values impact language learning, advocating for a curriculum that reflects and respects students' cultural identities.

Cultural Awareness in English Language Teaching: Developing an Inclusive Approach in Multicultural Classrooms

Teaching English as a Foreign Language (TEFL) is becoming increasingly important in the context of globalization, where students from different countries and cultures gather in the same classroom. Cultural awareness is becoming an important aspect of teaching, as it not only enriches the educational process, but also contributes to creating an inclusive environment for all students. This aspect includes understanding and respecting cultural differences, as well as the ability to adapt teaching materials and teaching methods to the diversity of students.
The purpose of this article is to explore the importance of cultural awareness in English language teaching and to suggest methods that can help teachers create an inclusive learning environment for multicultural classrooms. The article consists of several sections: the importance of cultural

awareness, the role of the teacher in multicultural classrooms, successful practices of cultural adaptation, and recommendations for teachers.

The Importance of Cultural Awareness in Teaching

Cultural awareness is the ability to understand, accept, and respect differences between cultures. In the context of language teaching, this includes knowledge of how cultural differences affect learning and communication. Understanding cultural differences helps teachers avoid stereotypes and biases that may affect students' perceptions.

Benefits of Cultural Awareness

1. Improved Language Skills: Students who learn a language in the context of their culture have a better chance of successfully acquiring the language. They can apply language skills in real-life situations, which helps them learn the material better.
2. Develop Critical Thinking: Discussing cultural topics helps students develop critical thinking skills. They learn to analyze information, draw conclusions, and express their opinions, which contributes to their intellectual development.
3. Developing Intercultural Competence: Cultural awareness helps develop intercultural competence, which is necessary for effective communication in a globalized world. Students learn to respect and accept diversity, which is a key skill in today's society.
4. Reduced Cultural Barriers: Increasing cultural awareness can help reduce cultural barriers between students, which promotes more harmonious interactions and a higher level of comfort in the classroom. The Role of the Teacher in Multicultural Classrooms

The Teacher as a Cultural Broker

The English teacher plays an important role in creating an inclusive classroom environment. Not only does he or she impart knowledge, but he or she also acts as a cultural broker who helps students understand and accept cultural differences. This requires a high degree of sensitivity and adaptability from the teacher.

Creating a Safe Learning Environment

In order for students to feel free to express themselves and ask questions, it is necessary to create a safe and supportive environment. The teacher should be sensitive to the emotional state of students and encourage their participation in discussions. For example, introducing a "reservation rule" (a time limit for expressing opinions) can help less confident students feel more comfortable.

Adapting Teaching Methods

Teachers should be prepared to adapt their teaching methods to accommodate the different styles and cultural backgrounds of students. This may include:

• Diversity of teaching methods: Using different approaches (visual, auditory, kinesthetic) allows for the inclusion of different learning styles of students. For example, visual learners may benefit from using graphs and charts, while auditory learners may prefer to learn through discussions and audio materials.
• Integrating cultural elements into the classroom: Incorporating cultural themes and examples into the classroom helps students see the practical application of language. Teachers can use materials that are relevant to the students' culture, which helps them better understand the language.
• Discussions about cultural differences: Teachers can organize activities where students share their cultures and traditions. This promotes mutual understanding and respect.

The Impact of Chinese and Japanese Cultures on English Language Teaching

1. Cultural Distinctions of China and Japan

China and Japan have deep cultural traditions and unique value systems that can significantly influence English language learning. It is important to consider these aspects in order to create an effective learning environment.

Chinese culture is characterized by an emphasis on collectivism, respect for elders, and hierarchy. The learning process in China often focuses on memorization and repetition, which may differ from the more interactive approaches common in the West. These traditions can influence students' expectations of the teacher and teaching methods.
Japanese culture also emphasizes collectivism and respect for tradition. However, unlike China, Japan has a strong cultural value associated with "Wa" (harmony), which encourages teamwork and avoidance of conflict. These aspects can be important when interacting with Japanese students, especially in the context of group assignments and discussions. 2. Integrating Cultural Elements into Teaching
Incorporating cultural elements from China and Japan into the classroom can enhance students' interest and improve their understanding of the language. Here are some ways to do this:
1. Using Authentic Materials:
• Including English texts related to Chinese and Japanese literature, art, and philosophy will help students see how culture influences language. For example, studying the works of authors such as Lao Tzu or Haruki Murakami can give students the opportunity not only to improve their language skills but also to gain a deeper understanding of cultural contexts.
2. Hosting Cultural Events:
• Organizing events around Chinese and Japanese holidays (such as Chinese New Year or Tanabata) can create an atmosphere of engagement and interest. Students can help prepare presentations that highlight the cultural characteristics of these holidays.
3. Introducing Cultural Norms:
• Discussing the norms and traditions associated with communication in China and Japan will help students understand how culture influences language. For example, greetings and forms of address are important in Chinese culture, while in Japanese culture, the use of polite forms and agreement with the interlocutor are important.
4. Project work:
• Students can work on projects related to the culture of China and Japan. These can be research projects about culture, history, language, or even gastronomy. Working in groups will help develop teamwork skills that are valued in both cultures.

3. Examples of successful practices
Scientific research shows that integrating cultural aspects into teaching can lead to better language learning results. In a classroom where teaching is based on cultural awareness, students show higher interest and motivation.
Example 1: Cultural exchange program. Some schools in China and Japan have cultural exchange programs where students can interact with native speakers via video conferences or exchange trips. This allows them to not only practice the language, but also understand cultural peculiarities in practice.
Example 2: Culture-oriented courses. Some educational institutions offer English language courses that focus on the cultural aspects of the countries where English is the primary language. This helps students not only learn the language, but also understand how culture shapes the language.

Successful Practices of Cultural Adaptation

There are several effective practices that can be used to successfully integrate cultural awareness into teaching.
1. Cultural Exchange Projects
Organizing cultural exchange projects allows students to interact with native speakers and become immersed in another culture. For example, exchange programs where students can participate in

video conferences with classes from other countries allow students to not only improve their language skills but also expand their horizons.

2. Integrating Cultural Topics into the Curriculum

Teachers can incorporate cultural topics into the standard curriculum. For example, instead of simply teaching grammar and vocabulary, a teacher can introduce texts related to cultural aspects such as holidays, traditions, and customs of different countries. Discussing these topics helps students improve their language skills and develop critical thinking.

3. Using Multimedia Resources

Including multimedia materials such as films, music videos, and documentaries can enrich the educational process. These resources allow students to see and hear language in context, which enhances cultural understanding and appreciation. Teachers can facilitate discussions after viewing to encourage students to reflect on cultural aspects and share their impressions.

4. Feedback and reflection

Teachers should actively encourage students to reflect on their own cultural assumptions and stereotypes. This can be done through written assignments, class discussions, or individual conversations. Feedback helps students to recognize their strengths and weaknesses in understanding other cultures and to develop critical analysis skills.

5. Creating a multicultural learning environment

Creating a learning environment where every student can feel valued and respected is a key aspect of cultural awareness. Teachers should be mindful of how they lead discussions and present different cultures. Respecting cultural differences and acknowledging the value of each student can significantly improve engagement and achievement.

Recommendations for teachers

1. Continuous training and development

Teachers should continually train and develop in the area of cultural awareness. This may include participating in trainings, reading professional literature, and sharing experiences with colleagues. Being aware of cultural differences will help teachers be more sensitive to the needs of their students.

2. Involving Parents and the Community

Teachers can actively involve parents and the community in the educational process. This can be achieved through parent-teacher conferences, cultural events, and joint projects. Involving parents helps build support for students and helps strengthen the community.

3. Using Technology

Technology can be an important tool for developing cultural awareness. Teachers can use online resources, peer-to-peer platforms, and social media to create a space for discussions about cultural topics. This will help students develop digital literacy skills and cultural awareness at the same time.

4. Encouraging Diversity in the Classroom

Teachers should strive to create classrooms that reflect cultural diversity. This may include using literature, art, and materials from different cultures. Teachers can create curricula that include different perspectives and approaches.

Conclusion

Cultural awareness in English language teaching is a critical aspect that can significantly impact student success. Understanding cultural differences and their impact on learning helps teachers adapt their methods and create an inclusive learning environment. Implementing practices such as cultural exchange projects, integrating cultural topics into the curriculum, using multimedia resources, and encouraging reflection

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The Technology of the Three-Dimensional Methodical Learning System as a Means of Enhancing the Quality and Efficiency of Education

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Abstract

This article examines scientifically-grounded approaches to modernizing the educational process through a technological approach, which serves as a means of implementing the concept of a humanistic paradigm in educational development. It highlights the system-forming role of diagnostically defined goals in transforming the methodological learning system (MLS) based on personality-centered and competency-based approaches. The necessity of improving existing principles and introducing new learning principles and content selection into scientific practice is substantiated. The essence of MLS and the innovative potential of the three-dimensional methodological learning system technology (TDMLS) are revealed. The critical role of the didactic matrix in the transformation of MLS and the development of TDMLS is demonstrated.

Keywords: transformation of the educational process, three-dimensional methodological learning system, didactic matrix, technology of the three-dimensional methodological learning system, stimulating assessment methods

The modern, rapidly changing world presents humanity with new challenges that demand quick, dynamic solutions. The primary driving forces behind this dynamic world are the total digitization of all aspects of life, global globalization, fierce economic competition among developed countries, and scientific and technological progress. Scientific and technological progress, as is well-known, is the progressive development of science and technology through quality education, resulting in the consistent modernization of technology, production methods, and organizational efficiency.

Therefore, the primary goal of numerous educational reforms over the past 30 years by the Ministry of Education and Science of Kazakhstan has been to improve education quality. According to the Law of the Republic of Kazakhstan "On the Status of a Teacher" (Clause 1.2, Article 15), ensuring education quality in accordance with state educational standards is a fundamental duty of a teacher. However, analysis of Unified National Testing (UNT) results indicates that a certain percentage of teachers fail in this duty, as annually, on average, 25-30% of students do not reach the threshold level, which aligns with the minimum level of recognition as established by the state education standard. The average UNT score has been declining, from 69.8 points in the previous year to 66 points in 2022.

Kazakhstan students' performance in international quality assessments, such as PISA and

TIMSS, remains very low, indicating that significant financial investments in various state programs for educational system development have not yielded the expected results. The term "education reform" has become almost a household irritation for society. In our view, the primary reasons for the crisis in educational reform are the following:

Firstly, universities are training teachers based on a classical knowledge-centric didactic approach that has not been subjected to scientific scrutiny nor transformed according to the requirements of innovative educational approaches, such as personality-centered, competency-based, digital, and STEM approaches. Attempts to modernize didactics by only modifying individual elements, such as using active and interactive methods in the educational process or "updating content" without scientific justification, have not had the desired effect since they lacked a comprehensive theoretical analysis of the learning theory in the context of new approaches. Fundamental aspects of learning theory, such as learning principles, content selection principles, diagnostic goal-setting, procedural and assessment-control parts of didactics, have long required modernization.

Secondly, traditional didactics lacks a study of pedagogical technology as a modern didactic tool that guarantees the achievement of academic success for all learners.

Pedagogical technology, which practically implements the educational and developmental potential of a modernized didactic approach and guarantees quality results, should become a key component of 21st-century learning theory.

The research results of scientists, as well as our experience, show that an effective reform of the education system aligned with contemporary pedagogical science requires the transformation of the entire educational sphere based on a technological approach that addresses both its foundational base and its structural elements.

In classical pedagogy, the following principles are common: educational content answers the question "what to teach?" and teaching methods answer "how to teach?" However, developers of pedagogical technologies argue that pedagogical technology addresses the questions of "What, how, and how effectively (qualitatively) to teach?" comprehensively and in a unified manner.

The term "pedagogical technology" was borrowed by educational scientists from the industrial sector, where technology is understood as a set of methods, tools, and processes for transforming raw materials to guarantee a product with specified qualities.

The primary characteristic of industrial technology is the dynamic improvement of the technological process to prevent defects. Education is also an industry that involves millions of students and teachers. However, the low quality of its results necessitates a systemic transformation of the educational process based on a technological approach.

Pedagogical technology should guarantee that all students acquire knowledge and skills meeting at least the state educational standards, promote the development of essential skills, subject-specific and key competencies (functional literacy), as well as creativity (creative abilities). Thus, the technologization of educational systems has become a new promising direction in pedagogical science and practice. Moreover, technologizing the learning process enables the practical implementation of the conceptual ideas of educational humanization [1].

As is known, innovative ideas within the humanistic paradigm are realized in the educational process through value-based, personality-centered, activity-oriented, competency-based, digital, and STEM approaches [1,2].

The technological approach, i.e., the development and application of educational technologies in the learning process, allows for the practical implementation of the conceptual ideas of these approaches in a comprehensive and systematic manner. It is worth noting that, at present, the application of these approaches is mainly realized through active and interactive methods. These methods are necessary for transformation but are not sufficient on their own.

This transformation requires changes in all components of the methodical learning system (MLS)—goals, content, methods, forms, and learning tools—in accordance with the requirements of the humanistic paradigm of education.

Pedagogical technology is a scientifically based didactic algorithm, a lesson design, the practical implementation of which should lead to guaranteed academic success for each learner [1]. Pedagogical technology is a project of an educational system whose implementation leads to guaranteed results (V.P. Bespalko) [3].

V.P. Bespalko defines a pedagogical system (PS) as a specific set of interrelated tools, methods, content, organizational forms, learning objectives (i.e., the methodological learning system, MLS), and processes required to create an organized, targeted, and intentional pedagogical influence on the formation of a personality with desired qualities [3].

All educational technologies are based on the idea (in addition to the guarantee of learning outcomes) of creating adaptive conditions for each student. This involves adapting the goals, content, methods, forms, and tools of learning to the subjective role of the student, emphasizing self-directed cognitive activities and expanding the student's functional roles. These requirements for learning technologies are aimed at modernizing the educational system based on fulfilling the requirements of the humanistic paradigm. They imply the modernization of the methodological learning system based on the approaches mentioned above, including the technological approach.

Traditionally, students learn the content of educational material through techniques, methods, forms, and learning tools under the teacher's guidance. However, in an activity-oriented approach, the content should serve as a tool for both development and the independent acquisition of knowledge and skills. Learning forms should foster an environment of active and interactive engagement among all participants in the didactic process. Teaching methods and tools should transform into instruments for the student's independent exploration and inquiry in the educational environment.

The transformation of the methodological learning system based on the listed innovative approaches (including the technological approach) is realized by modernizing goal-setting, improving existing principles of learning and content selection, and introducing new content selection principles into didactics [1].

V.P. Bespalko convincingly argues that diagnostic goal-setting is the starting point for developing educational technologies, pointing out that diagnostic goals are still absent in modern schools and pedagogy. This absence is the primary reason for the stagnant state of schools and "childless" formal pedagogy [3]. "Today, the educational process operates, paradoxically, without clear goal-setting and without objectively assessing its outcomes. Bypassing the goal-setting stage, educators rush to construct curricula, programs, manuals, and other teaching aids. This loosens and makes amorphous the conceptual foundation of education, leaving ample room for negative phenomena such as formalism and an obsession with statistics, as well as other factors that objectively hinder reform," states V.P. Bespalko [3]. As is known, diagnostic goal-setting in learning is characterized by learning outcomes expressed in students' actions, which are identifiable and measurable [4].

From the phrase "learning outcomes expressed in students' actions," which defines the concept of diagnostic goal-setting, the following conclusions can be drawn:

a) Learning should be organized based on students' independent cognitive activities.

b) Learning outcomes form a hierarchical, interdependent structure, as students' activities involve a hierarchy of actions: reproductive, transformative, and productive [3].

Based on this hierarchy of activities, scientists have defined corresponding hierarchies of learning outcomes. For example, academician V.P. Bespalko has identified the following levels (hierarchies) of learning material mastery: student level, algorithmic level, heuristic level, and creative level [1,3].

The most well-known system of goals with such properties is the taxonomy of learning objectives by American scholar B. Bloom. Bloom's taxonomy of objectives includes the following hierarchically dependent components: knowledge → comprehension → application → analysis → synthesis → evaluation.

It is evident that Bloom's taxonomy describes a level-based developmental activity for students. Starting from the "application" level, it integrates competency-based approach requirements by building upon the previous levels.

As is known [4], a goal is a highly specific, qualitatively characterized image of the desired (expected) outcome that a student can achieve within a strictly defined timeframe. Diagnostic goal-setting implies that when formulating the goal, there is always a mechanism (method) to verify that the result matches the intended goal. The alignment of goals and outcomes determines the quality of learning. Hence, the goal and outcome must be presented, measured, characterized, and described in the same units and parameters [4].

V.P. Bespalko defines diagnostically set goals as hierarchically structured student activity outcomes, i.e., levels of mastery (student, algorithmic, heuristic, and creative levels).

In designing a pedagogical system based on the technological approach, V.P. Bespalko suggests sequential mastery of educational material, i.e., the gradual progression of students' cognitive activities from the reproductive level to the transformative level, and then to the productive level [3].

Implementing diagnostically set learning goals requires hierarchically structured educational content, as students' developmental actions are directed at mastering hierarchically systematized learning material. Notably, this hierarchical content structure forms its developmental and procedural foundation.

These points demonstrate the need to revise certain classical didactic principles and introduce the following new content selection principle: "alignment of content with educational goal taxonomy."

Content with a hierarchical structure, allowing for the achievement of the full range of goal hierarchies, is termed three-dimensional content. The total digitization of the educational system requires the introduction of a new principle in didactics: "consideration of the didactic capabilities of ICT and robotic systems" when selecting educational content.

It is essential to note that the hierarchical nature of content not only highlights its structural-foundational basis but also enhances the procedural and developmental-activity aspects, which are neither noticeable nor functional in traditional "knowledge-based" content.

The hierarchical nature of educational content is scientifically substantiated in the works of I.Ya. Lerner and H. Taba [1]. H. Taba identified three sequential, hierarchically subordinate stages of cognitive formation and, accordingly, three types of educational tasks: 1) concept formation, 2) data interpretation, and 3) application of rules and principles. She also demonstrated that each of these types of educational and cognitive activities corresponds to a specific teaching strategy. By doing so, she developed hierarchically aligned strategies based on the main three types of cognitive tasks she identified. It is evident that I.Ya. Lerner's theory of the four-element basis of educational content is confirmed by H. Taba's conceptual conclusions.

Our research showed that not only the goals and content but all components of the methodological learning system (goal, content, methods, forms, and tools of learning) form a hierarchy and are interconnected on various levels [1,5]. The structure of the first two elements (goal and content) of the methodological system forms a strict hierarchy, while the hierarchical structure of the remaining elements is "derived" from them.

We have termed a methodological learning system whose elements form a hierarchically layered, multi-level structure as a "three-dimensional methodological learning system." The "three-dimensional" aspect signifies the presence of multi-level hierarchy, i.e., a vertical

dimension (height) relative to each component of the methodological learning system: goals, content, methods, forms, and tools of learning. Thus, the three-dimensional methodological learning system is a scientifically substantiated extension of B. Bloom's idea of the taxonomy of educational objectives to all components of the methodological system.

Traditional "knowledge-based" content aligned with "knowledge-based" learning, which was implemented through the first-level components of the three-dimensional methodological learning system. The "knowledge-based" methodological system "wrapped" around the first level of the three-dimensional system, restricting the learning process to the zone of the student's proximal development, with students' achievements assessed primarily at the level of "knowledge and comprehension." For this level of mastery, students received "good" and "excellent" grades, leading to a widespread graduation of students who did not truly confirm their level.

It is important to note that when performing level-based developmental tasks (mastering three-dimensional content), students set their own goals for solving the given task. The skills of independent goal-setting for completing three-dimensional tasks gradually help students develop the ability to set goals independently for creative tasks.

Only the three-dimensional methodological system adequately meets the requirements of developmental learning and a personality-centered approach. Through independent cognitive activities and gradually performing level-based tasks, starting from "knowledge" and reaching "creation," students acquire research skills, the ability to independently acquire and apply knowledge, and thus develop functional literacy. It is worth noting that subject competencies in students are formed when their level of mastery reaches at least the level of "application." Activity that transitions from a reproductive to a productive level—thus achieving developmental learning—is accomplished through students' sequential completion of level-based tasks within three-dimensional content.

In using the three-dimensional methodological learning system, the main role lies in the development of level-based developmental tasks for the specific topic of the educational material. These tasks can be designed in various ways, based on the characteristics of B. Bloom’s taxonomy of objectives or V.P. Bespalko's levels of mastery (see Table 1).

System of Requirements for Developing Developmental Learning Tasks

Table 1

Learning Goals	Description of Learning Tasks
Knowledge	**Simple tasks (single action) focused on:** - knowledge of facts, basic concepts, rules and principles, procedures, terms; - recognition; - reproduction; - identification; - listing and description; - comparison and distinction; - categorization; - solving typical problems in standard situations; - basic calculations; - conducting simple experiments based on instructions.
Understanding	**Simple and composite tasks focused on:** - understanding of facts, rules, and principles; - comparison; - identifying relationships; - highlighting the main points; - explaining causes and effects; - interpreting material (explaining, summarizing in one's own words); - interpreting diagrams, graphs, and charts; - converting verbal information into mathematical expressions; - solving typical problems in non-standard situations.
Application	**Composite tasks focused on:** - using learned material in new situations; - applying rules, methods, concepts, principles, laws, theories in practical scenarios; - using or applying information and ideas to solve a problem; - sketching schematics; - modeling; - organizing; - providing proofs; - drawing analogies; - solving computational and experimental tasks containing subtasks with clear interconnections; - conducting laboratory and experimental-research work, solving educational-research and project tasks (with integrated intra- and interdisciplinary content).
Creation	**Composite tasks focused on:** - generalization; - modeling; - abstraction; - writing essays; - creative application of knowledge; - formulating and confirming hypotheses; - argumentation; - developing an experimental plan, drawing analogies to solve real-life problems; - establishing connections and mutual influences; - non-algorithmic problem-solving; - analyzing and interpreting research results; - evaluating the logic of material organization in written texts; - assessing the relevance of conclusions to the available data; - evaluating the significance of a product based on external quality criteria; - forecasting; - solving non-standard problems, including those related to real-life situations; - solving complex computational and experimental tasks with implicit connections between subtasks; - defending project work (theoretical and applied, requiring integrated interdisciplinary content within one subject area or cycle); - solving high-complexity Olympiad-level problems in natural sciences and mathematics; - constructing robot models requiring high-level digital and engineering-technical skills.

Table 1 presents scientifically based requirements for selecting the content of level-based developmental tasks. In [1], scientifically substantiated requirements for the content selection of level-based tasks are provided. Our research has shown that the shift from knowledge-based content to three-dimensional content, in turn, requires the modernization of existing theories on educational content, textbooks, and learning theories [1,3]. The practical application of the three-dimensional methodological learning system has shown that by creating level-based content for each topic in their subject, teachers can independently develop developmental textbooks and educational and methodological kits (EMKs). Many teachers who use technology based on the three-dimensional methodological learning system in practice have subsequently become authors of textbooks and EMKs [1].

The three-dimensional methodological learning system, integrating the full spectrum of

goals, content, methods, forms, and learning tools, becomes a developmental component of the constructive model of learning.

Our research has shown that the structure of levels of motivation, skills, knowledge quality, and mastery also has a scientifically substantiated hierarchy [1]. We have termed the table of their interconnections with the three-dimensional methodological learning system, where components are interconnected both vertically and horizontally, as the **didactic matrix** (see Figure 1).

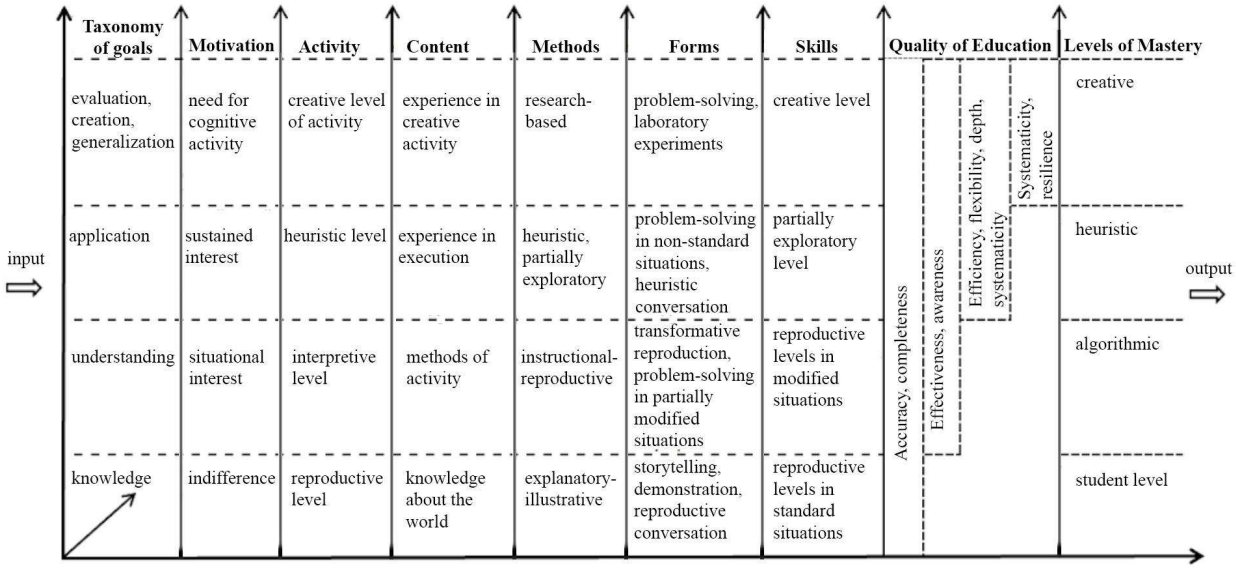

Figure 1. Didactic Matrix

The didactic matrix enables the design of the educational process by incorporating its **motivational, content-methodological,** and **control-evaluation** components, which, "following" **the three-dimensional methodological learning system,** acquire a **three-dimensional structure** that assumes a **dynamic**, **upward-focused** educational process. Traditional knowledge-centric learning primarily occurs within **the first two levels** of the didactic matrix. Learning quality is determined by the **relationship** between the set **goals** and the achieved **results**. It is easy to see that the didactic matrix fully encompasses the student's "**zone of proximal development.**"

Since cognitive techniques such as analysis, synthesis, comparison, identifying the main points, generalization, and others are applied across all levels of mastery (knowledge, understanding, application, etc.) with varying degrees of complexity, we incorporated an updated version of B. Bloom's taxonomy of goals, developed by L. Anderson and D. Krathwohl, into the didactic matrix. This version excludes "analysis" and "synthesis," combining "generalization," "evaluation," and "creation." Creation (creativity), not included in the earlier taxonomy, represents the highest level in the new version. For creative tasks, students generate, plan, and produce (create).

In our view, only such a taxonomy of goals (knowledge, understanding, application, creation) adequately corresponds to the hierarchy of mastery levels (learning outcomes) as substantiated by academician V.P. Bespalko, supporting an objective (criterion-based) assessment of learning outcomes. We assert that a genuinely developmental, productive, and guaranteed-result learning process can only be achieved by organizing the didactic process to implement the level-based interconnection of the didactic matrix's elements from the bottom up.

Completing tasks at the first two levels (knowledge, understanding) forms a solid foundation of core knowledge in the subject (in traditional education, students receive "4" and "5" for this). Completing these tasks, as well as those at the "application" level, forms the basis of subject competence and functional literacy. The content of tasks at the "application" level includes

intra- and interdisciplinary integration within a single subject area, mastered at least at the "algorithmic" level. This content can be presented as laboratory or educational-experimental work, requiring integrated content for investigating phenomena. The integrated content needed for solving project and research tasks forms the basis of the "application" and "creation" levels. At the "creation" level, the content involves integrated subject matter required for solving the research (project) task, mastered by students at a level no lower than "heuristic."

Performing tasks at the "creation" level forms meta-disciplinary competencies and engineering-technological skills. Work [4] demonstrates that learning quality is defined by the relationship between goals and results as a measure of goal achievement, provided that goals (results) are diagnostically set and predicted within the student's zone of proximal development. The didactic matrix, based on this concept, enables a clear and hierarchical arrangement of students' knowledge quality [1] (see Figure 1).

The process of motivation formation in developmental learning has a hierarchical structure. Motivation is ensured by presenting tasks that contain contradictions, surprises, or puzzling elements, which encourage a person to solve the task. Motivations of the corresponding level support the student’s gradual progression up the didactic matrix. Here, we rely on A. Maslow's hierarchy of needs, which asserts that people need an environment (group, class), self-respect (aspiring to be a leader), and the realization of their full potential (creative self-expression) [6].

Maslow's hierarchy of needs forms the foundation of "process motivation," ensuring the student's gradual upward movement in the didactic matrix from the "knowledge" level to the "creation" level. Stimulative assessment of student achievement also plays an important role [1].

Thus, the didactic matrix synthesizes all hierarchically presented components of the didactic process and the methodological learning system. It allows these components to be presented in an interconnected, dynamic manner, encompassing the motivational, content-methodological, evaluative, procedural, and developmental aspects of the learning process.

Moreover, the didactic matrix enables the visualization and dynamic representation of the gradual progression of a student's quality from their "zone of actual development" (ZAD) to their "zone of proximal development" (ZPD) [1,2].

The technology of the three-dimensional methodological learning system (TDMLS) is understood as a project of an educational system developed on the platform of the didactic matrix (including the three-dimensional methodological system), allowing students to engage in exploratory and research activities, integrate collective and individual learning formats, guarantee learning outcomes for each student, and provide a criterion-based (objective) assessment of achievement.

The technology of TDMLS, as a project of an educational system developed with reference to the didactic matrix, integrates the didactic potential of two main trends in pedagogical technology systems:

1. implementing learning presented in the form of a research process (constructivism, critical thinking technology, etc.) in the synectics part;
2. implementing result-oriented learning in its second part [1].

Thus, the technology of the three-dimensional methodological learning system combines the innovative potential of two types of technology: research-oriented and result-oriented. The synectics part of TDMLS uses active and interactive learning methods. Our experience has also shown the effectiveness of applying critical thinking technology in solving project and research tasks within the synectics part of TDMLS, consisting of three stages: challenge, comprehension, and reflection [2].

At first glance, the structure of TDMLS may seem complex. However, the research part of TDMLS is fully realized in the solution of educational-research and project tasks. In practice, in

many cases, brainstorming and problem-solving techniques are used in this part of TDMLS, where students collectively (in groups) immerse themselves in researching the problem under study. Then, the teacher provides students with developmental level-based tasks to reinforce the knowledge acquired in the first part and explore the material independently, delving into it as they progress up the steps of the didactic matrix. Thus, the two parts of TDMLS complement each other, contributing to the successful solution of the main task of modern pedagogy—forming subject-specific and meta-disciplinary competencies, which reflect a high level of learning quality that meets global standards.

When solving educational-research and project tasks, the synectics part of TDMLS is fully realized, assuming the use of critical thinking strategies. Students, working in groups, applying interactive learning techniques and strategies at all stages of critical thinking, move up the "steps" of the didactic matrix. The critical thinking stages—challenge, comprehension, reflection—correspond to the hierarchy (levels) of thinking: reproductive, productive (creative), and the hierarchical levels of the didactic matrix [1].

In the result-oriented part, students independently solve level-based tasks, moving individually up the development steps of the didactic matrix, simultaneously reinforcing the subject-specific and meta-disciplinary competencies formed in the synectics part. It is worth noting that the formation of students' functional literacy requires organizing learning that encompasses the levels of "application," "generalization, evaluation, and creation" in the TDMLS didactic matrix.

Thus, during the student's independent cognitive-research activity, both components of TDMLS interact with each other, enhancing the effectiveness of the lesson and significantly amplifying the innovative potential of this integrated technology, i.e., TDMLS.

It is worth noting that with the implementation of TDMLS, each successive step in the learning outcome hierarchy narrows, and therefore, the logical-structural model of TDMLS takes the shape of a pyramid (see Figure 2).

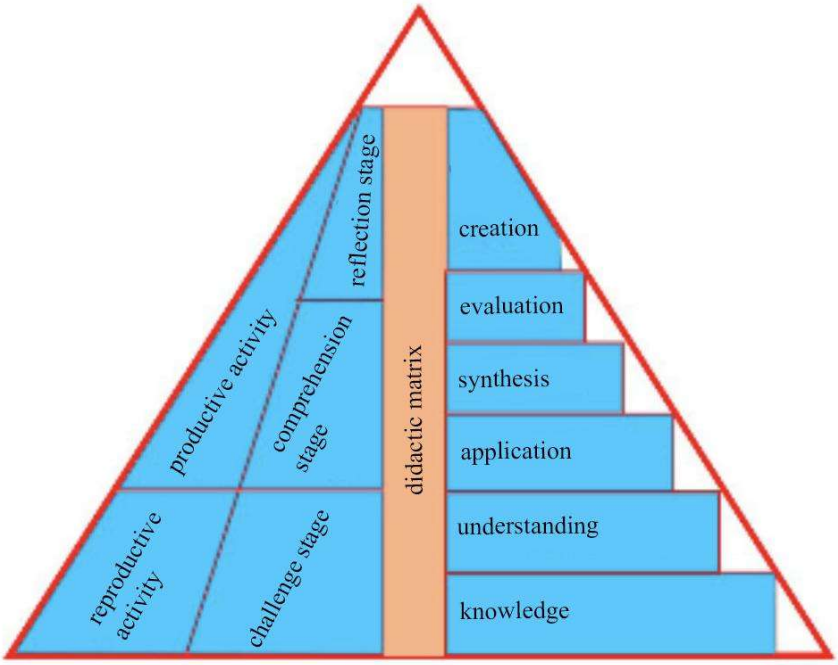

Figure 2. Logical-Structural Model of TDMLS

In TDMLS (Three-Dimensional Methodical Learning System), a new assessment concept is

used, allowing not only for criterion-based (objective) assessment of students' academic achievements but also for implementing a stimulating method of assessment in practice. The humanistic paradigm of education and a health-preserving approach to learning call upon 21st-century didactics to radically reshape the conceptual foundations of educational qualimetry. TDMLS implies a shift from the principle of "assessment as punishment for mistakes" to "assessment as encouragement for success." Assessment by "subtraction" transitions to assessment by "addition." This shift is implemented by introducing the "credit" as a unit of measurement.

The lowest level of mastery is assessed by credit, where "no credit" requires retaking, thereby guaranteeing that students avoid failing grades. After receiving credit, students gain the right to move on to tasks at the next level. Students' progress in completing tasks is synchronously marked as "+" in a "transparent journal," where students themselves record their achievements (after teacher approval). This transparent journal allows one to see students' progress along the three-dimensional content ladder. The process of self-study dynamically takes on a game-like form, creating a competition to complete as many level-based tasks as possible. Students are permitted to consult with each other and the teacher.

After the allotted time, the teacher briefly discusses with the class any problem areas in the tasks, records the results in the "transparent journal," and gives grades only to those students who completed all level-based tasks within the given time. Other students receive homework assignments to complete the tasks after reviewing the textbook material and studying it from other resources.

In the next lesson, after hearing the key points of the studied material and assessing the student’s independent achievement on level-based tasks based on criteria, the teacher provides an objective grade. Such objective, achievement-encouraging assessment creates a favorable, comfortable educational environment. Thus, the most stressful part of the learning process—the control-evaluation stage—takes the form of celebratory encouragement, rewarding successful efforts. Negative effects of traditional assessment, such as "fear of failure" and the "overachiever syndrome," disappear. In this constructive learning model, students freely engage in discussions, openly sharing their opinions without fear of consequences. Following this, student grades are recorded in the official class journal.

Thus, introducing a new assessment concept eliminates stress caused by the subjectivity and punitive nature of traditional assessment. A transparent, objective, and universally understood assessment policy (by students, teachers, and parents) promotes fairness and creates a comfortable educational environment. Consequently, TDMLS meets all requirements of health-preserving technology [1].

TDMLS ensures students' active engagement and high intrinsic motivation through the use of interactive methods, a strict progression in learning material from simple to complex, and a stimulating assessment approach.

When this technology is applied, the goals of the first and second levels (knowledge, understanding) are achieved at 100%, with a dynamic increase in "application" and "creation" levels (see Figure 3) [1]. This high performance is guaranteed by the strict sequence of increasingly complex level-based tasks (knowledge, understanding, application, creation), strong intrinsic motivation, and student activity, all supported by active methods and a stimulating assessment approach.

When assessing students’ activities within a learning technology based on the three-dimensional methodological learning system, the overall class performance in a specific subject can be characterized as shown in Figure 3.

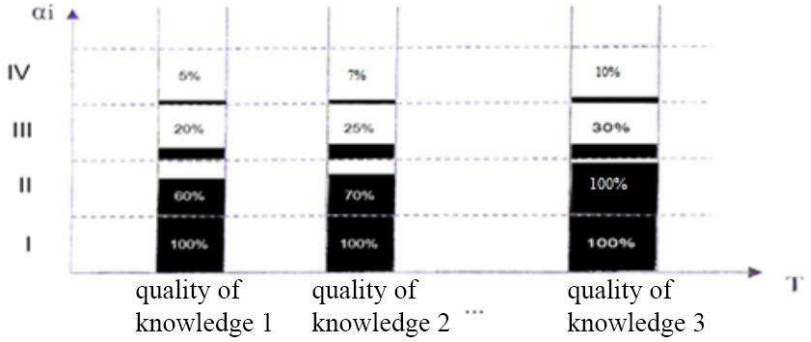

Figure 3. Class Academic Performance by School Year Quarters

Figure 3 allows for an assessment of mastery levels not only in percentage terms but also for comparing such metrics by quarter, revealing growth and progress. Our years of practical experience have demonstrated the high developmental potential of TDMLS (Three-Dimensional Methodical Learning System).

In summary, TDMLS serves as a means of enhancing the quality and efficiency of the entire secondary education system (see Figure 4).

Years of using TDMLS have shown the following multifunctional properties, which further affirm that this technology is a scientifically-based tool for transforming the entire secondary education system [1].

The application of TDMLS facilitates a shift from knowledge-centered didactics to a personality-activity-centered, developmental didactic model, with the three-dimensional methodological learning system as its foundation. The core of TDMLS—the didactic matrix—is a foundational element of three-dimensional didactics and a "developmental ladder" for the student within the learning process.

TDMLS enables the realization of the innovative potential of two global trends in pedagogical technology: 1) research-oriented technology and 2) result-oriented technology. The first, the synectics part, organizes learning based on interactive methods and critical thinking technology, while the second guarantees results aligned with state education standards, leveraging the developmental factor of the didactic matrix.

Using TDMLS introduces an objective, precise, scientifically-based pedagogical qualimetry system, including a criterion-based system for assessing students' achievements, accurate diagnostics, and monitoring of learning quality.

TDMLS effectively fosters key educational competencies and functional literacy in students and plays an important role in preparing them for international quality assessments like PISA and TIMSS.

The use of TDMLS promotes high levels of motivation, engagement, self-discipline, and self-actualization skills. Skills in reflection and comprehension allow for effective management of the learning process.

TDMLS facilitates the effective use of information and communication technologies in learning, helps identify gifted students, and promotes early career orientation for students.

TDMLS creates comfortable conditions for students—the subjects of the educational process—relieves overload and stress in learning, and enables the integration of health-preserving didactics into school practice.

It allows for the implementation of the "Developmental Textbooks" project, where the teacher becomes the textbook developer.

It brings the educational and innovative potential of elite and standard public schools closer together.

It enhances the effectiveness of rural small-scale schools (MKSH), including those with

combined classes.

The application of TDMLS successfully addresses the educational and developmental tasks of preschool institutions, colleges, universities, and inclusive education.

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Transformation of the Education System Based on the STEM Approach as a Condition for Preparing Competitive Human Capital in the Modern World

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Universal globalization and digitalization, along with the intense dynamism of technological advancement, are setting an entirely new pace for the economic and social development of societies in leading countries.

In 2011, in Germany, Klaus Schwab, the president of the World Economic Forum in Davos, announced the arrival of the 4th Industrial Revolution (Industry 4.0), characterized primarily by high-tech digital industries [1].

Society embracing the era of universal digitalization and technological development at the Industry 4.0 level has been named Society 4.0 by global experts [1,2,3]. Industry 4.0 implies a new approach to production, based on the large-scale adoption of information technologies in industry, extensive automation of business processes, and the proliferation of artificial intelligence [1].

Developed 21st-century countries (among which Kazakhstan aims to be included in the coming years) are characterized by competitive economies with Industry 4.0, featuring competitive science and education systems that meet the demands of Society 4.0. In Industry 4.0, economic growth is not based on natural resources but on innovation and competitive human capital [2, 3, 4].

High-tech production in Industry 4.0 involves not only the use but also the advancement of digitalization and robotics in industry (utilizing quantum and supercomputers, artificial intelligence, IoT, big data technologies, and more). It also involves the dynamic renewal of technologies and equipment, meaning the invention and integration of innovations into production.

Global experience shows that Society 4.0, combined with Industry 4.0, requires a radical transformation of the educational system. This transformation presents education with complex challenges: preparing the younger generation for life in the society of the future (Society 4.0), which demands from them unique intellectual abilities required for high-tech industry specialists, as well as key 21st-century competencies and skills. Thus, Industry 4.0 and the "smart economy" set entirely new tasks for the education system. Society 4.0's social demand is for the "alignment of the educational paradigm with the industrial paradigm of Industry 4.0." According to foreign experts, specialists of Society 4.0 should possess key educational competencies and demonstrate advanced scientific, digital, and engineering-technology training [2, 3, 4].

Future specialists must be prepared for mobile adaptation to new conditions and the acquisition of new skills to keep up with changes in the labor market and rapidly evolving technological innovations. Therefore, the concept of "lifelong learning" is of particular importance

for the development of the educational system in rapidly changing conditions. This concept emphasizes integrating efforts from various forms of education: formal (learning in state educational institutions), non-formal (mentorship, training, internships, etc.), and informal (self-education through Coursera, YouTube, etc.).

Research analysis [4,5,6,7,8] shows that Industry 4.0 sets expectations for higher education institutions to reach the status of "University 4.0" or at least "University 3.0." As is known, "University 1.0" focuses on quality educational activities, "University 2.0" on both educational and scientific activities, and "University 3.0" engages in educational, scientific, and entrepreneurial activities, meeting the needs of high-tech industries. "University 4.0" can address modern industry problems by transforming the concept of industry itself, thereby becoming a leader in high-tech sector development [6].

The world has experienced a "delayed response" from the education system to the needs of rapidly developing innovative technologies and industries for workforce preparation. In the 1990s, the U.S. faced a serious problem where potential candidates often lacked the required qualifications for high-tech company roles. In response, major U.S. companies pointed out that K-12 and higher education systems were not aligned with the needs of fast-growing high-tech sectors. In 2001, the National Science Foundation proposed the introduction of the STEM approach to modernize the U.S. education system [9,10].

The STEM educational concept (Science, Technology, Engineering, Mathematics) presents new approaches to learning, integrating natural sciences, mathematics, computer science, technology, and engineering into a cohesive system to solve real-life problems. Thus, STEM education represents an integrated learning approach where scientific and technical academic concepts are studied in a real-life context [7,9,11].

The main components of STEM education—science, technology, engineering, mathematics, and ICT—cover all spheres of modern life and are essential indicators of Industry 4.0's functioning and development. This emphasizes the significance of the STEM approach in preparing a competitive human capital pool for Industry 4.0, thus making STEM education an essential answer to the challenges of the dynamic industrial-digital era.

Examining the U.S. experience with STEM education transformation since 2001, several economically developed countries began to adopt this trend in their educational systems. This process accelerated after Klaus Schwab announced the advent of the Industry 4.0 era in 2011. The factors driving STEM integration in education are: 1) the National Science Foundation's 2001 decision, and 2) the 4th Industrial Revolution, established by K. Schwab in 2011. Currently, the U.S., the UK, China, South Korea, Singapore, Turkey, and other developed countries are systematically implementing STEM education through government programs. In Germany, the MINT program (Mathematics, Computer Science, Science, Technology) is implemented, overseen by the country's chancellor [5,8,9,10].

In the CIS countries, a systematic approach to integrating STEM education into educational standards has yet to emerge. Russia is implementing this trend in its federal educational standards in a unique way [11]. Moreover, CIS countries lack a systematic approach to applying conceptual ideas of activity-based, competency-based, and digital approaches in practice [12]. Since 2014, Russia has prioritized engineering education, and in 2019, a new subject area concept, "Technology," was developed considering STEM requirements [13,14].

In Kazakhstan, there is no unified approach to implementing STEM education ideas. However, some advanced schools (such as NIS, BINOM, etc.) are introducing STEM elements, characterized mainly by initial robotics studies, ICT-supported lab work, and project-based methods in the educational process [5,10].

In recent years, numerous research studies have emerged on this issue abroad and in CIS countries. Studies on the general pedagogical principles of STEM education are covered in

[2,3,4,6,9], and the scientific-methodological aspects of STEM subjects are addressed in [9,10,11,13,14]. Particularly relevant to this study is Seymour Papert's work on using the LOGO environment as a tool for independent learning and a means of studying algorithm basics and programming, thereby fostering engineering and technological thinking [12].

However, analysis of these and other studies shows a gap in research on: 1) the psychological and pedagogical foundations for transforming the education system using the STEM approach, 2) modernization of learning theory and content theory based on STEM requirements, and 3) the didactic essence and scientifically substantiated characteristics of STEM education components. The potential of modern ICT and robotics tools as innovative means to implement activity-based, competency-based, and digital approaches in engineering and technological skills formation has yet to be fully explored. Additionally, scientific foundations for integrating STEM education's natural science, technology, robotics, and informatics content are absent. There is also no comprehensive research on organizing pre-profile and profile training based on STEM requirements [5,17].

Therefore, by studying and synthesizing the experiences of foreign countries and our country's educators, it is necessary to substantiate the relevance and methods of transforming the educational system of the Republic of Kazakhstan based on the STEM approach and reveal the didactic essence of STEM education.

The theoretical and methodological foundations of this study are rooted in fundamental research in modern pedagogy and psychology; personality and activity theory; theory of educational content; developmental, competency-based, and digital approach concepts; theoretical positions in pedagogy and psychology on designing pedagogical systems and implementing educational research outcomes in practice.

To address this didactic challenge, research methods included studying scientific and educational literature, theoretical analysis of problem development, comparative-pedagogical analysis of government standards, curricula, and textbooks, as well as scientific-methodological analysis of school education content in the context of the problem. Additional methods included instructional process modeling, observation, and discussions [5,17].

Experts have demonstrated that sustainable development of a country with a competitive economy and Industry 4.0 is primarily linked to educational reform in the STEM direction [7,9]. This is natural since the intense competition and total digitalization across all spheres of human life, including industry, require continuous improvement of technological processes, driving them from a mechanized level to a "high-tech" level. This situation implies studying the basics of technical and technological processes in school, using the laws and principles of STEM subjects (Natural Science, Mathematics, and Informatics) in an integrated format.

Moreover, the main condition for competitiveness—"always being a step ahead"—implies having specialists who not only quickly adopt new technologies but can also improve them. This means engineers-inventors creating more efficient technologies and new equipment with innovative digital components. Engineering skills involve not only 21st-century skills and global competencies but also creative, inventive abilities.

Therefore, STEM education, aimed at forming students' engineering and technological skills, contributes to realizing the core value of "Creation and Innovation." Consequently, future specialists should acquire polytechnical competencies from school, studying subjects like "Technology," "Robotics," and "Informatics" integrated with natural science and mathematics subjects to solve specific applied problems, thus mastering modern engineering skills.

STEM education's primary components—technology and engineering, alongside digitalization—cover all spheres of modern life and are indicators of Industry 4.0's development, underscoring the importance of the STEM approach in preparing competitive human capital.

All this necessitates the transformation of secondary education based on the STEM approach, alongside reforming vocational and university systems to meet the requirements of engineering and technological education. Only in this way will the educational paradigm of Society 4.0 align with the industrial paradigm of Industry 4.0.

From the above definitions and essence of STEM education, it is clear that STEM education effectively implements the conceptual ideas of activity-based, competency-based, and digital approaches.

The essence of activity-based, competency-based, and digital approaches and STEM education suggests that these approaches are conceptually interconnected and interdependent. The STEM approach extends and modifies the integrated format of activity-based, competency-based, and digital approaches in the context of educational requirements in engineering and technological trends, thus forming an innovative component of this sector's new developmental paradigm.

A new educational methodology based on the STEM approach, integrating and extending the innovative potentials of the above approaches, suggests transforming the content-methodological foundations of school education.

Our research shows that, along with classical content selection principles, the STEM approach requires the introduction of the following principles into the theory of educational content selection [12]:

- The principle of education digitalization, which involves considering ICT's didactic potential and defining the educational goals for its use.
- The principle of aligning content with all levels of the educational objectives taxonomy, covering both the "current" and "near" developmental zones of learners. Modern educational content should span the full hierarchy of learning goals from Bloom's taxonomy, from "knowledge" to "creation," the levels of assimilation from "learner" to "creative," and the hierarchy of cognitive activity from "reproductive" to "productive," encompassing all developmental zones.
- The principle of practical and applied orientation and engagement of educational content, enhancing aspects of practical relevance and real-life connections of educational material, forming applied content in subjects.
- The principle of student agency in educational content, promoting active productive student engagement and a teacher-student partnership in the learning process.
- The principle of content alignment with STEM (including engineering and technological education), profiling, and project work in multifunctional laboratories, workshops, and Maker spaces.
- The principle of selecting integrated content from STEM subjects with practical relevance for project and research work, considering the didactic potential of robotics.
- The principle of content alignment with inclusive education [12].

Developing STEM competencies in students involves not only building skills in mathematics, reading, science, and global competencies but also digital and engineering-technology skills. Thus, the level of STEM competency is determined not only by PISA results but also by outcomes in international robotics competitions and WorldSkills contests.

These studies assess students' ability to use knowledge in a specific subject area to understand and solve problems beyond the scope of that area. This evaluates the level of functional literacy and the development of cross-disciplinary skills in students. In fact, PISA exists to provide governments with clear benchmarks for creating educational strategies. OECD Secretary-General Ángel Gurría noted that PISA is more than just a ranking; it "is an indicator of how well an education system prepares young people for tomorrow" [12].

It's also worth noting that results from international robotics competitions and WorldSkills demonstrate how well a country's education system meets the demands of Industry 4.0. Naturally, we must also consider that building STEM competencies relies on subject-specific and cross-disciplinary competencies, primarily from the subjects included in STEM education [5].

The above points also show that the STEM approach is a leading trend in modern education, modifying activity-based and competency-based approaches to meet Industry 4.0 requirements. The main goal of the STEM approach is to overcome the traditional education system's disconnect from practical problem-solving and create clear links between school subjects for students. This means developing and expanding students' applied skills, gained in technology classes, by using engineering methods, the innovative potential of robotics, programming, 3D printing, and STEM subjects. Thus, STEM is a universal, practice-oriented approach that enables students to handle academic and applied scientific project tasks using STEM labs.

A distinctive feature of engineering education, a major component of STEM for developing engineering skills, is its strong foundation in scientific, mathematical, and worldview knowledge, its breadth of interdisciplinary systemic-integrative knowledge about nature, society, and thought, and a high level of general and specialized knowledge [16].

School-based STEM education lays the groundwork for meeting the economy's needs for high-tech sector development while sparking students' natural interest in mathematics, computer science, engineering, technology, and technical sciences. The existing knowledge-based system, disconnected from real-life application, has diminished students' motivation to study STEM subjects and hindered the development of creative and engineering thinking, limiting the preparation of modern workforce resources.

Thus, the STEM approach rests on four principles: project-based learning organization, the applied nature of tasks, cross-disciplinary learning, and covering subjects crucial for training engineers or applied science specialists, including STEM subjects (physics, chemistry, biology, geography), mathematics, modern technology, and engineering [9].

An important task of the subject "Technology," a core STEM component, is to show students the practical significance of scientific knowledge and its targeted application across various technologies. When students recognize the practical value of "academic" knowledge, it boosts their learning motivation and highlights the functional importance of concepts, phenomena, and laws for use in technological processes, fostering technological thinking and literacy.

The technology curriculum is based on a holistic view of the surrounding world, reflected through students' creative activities. Hence, the content of technological education is integrative. Studying technologies and processes relies on the principles of mathematics, physics, chemistry, biology, and other subjects. The modern scientific mindset naturally inclines towards knowledge integration, evident not only in the interaction between traditional sciences but also in the rise of new technologies at the intersection of adjacent fields, like biotechnology, nanotechnology, and neurotechnology [13]. Therefore, the need to synthesize knowledge, comprehensively learn it, and apply it in practical activities and life underpins the development of cross-disciplinary integration across all education levels. Cross-disciplinary connections in school technology education exemplify the integration processes occurring in science and society today [13].

Another key STEM component is engineering. Engineering involves technical activities across a range of specialized fields and disciplines, focused on the practical application of scientific, economic, social, and practical knowledge to harness natural resources for human benefit [15]. The purpose of engineering is the invention, development, creation, implementation, and improvement of technology, materials, and processes. Engineering is closely tied to science, relying on fundamental science principles and applied research results. It bridges fundamental science and various economic sectors, encompassing three types of engineering activities: 1)

research (scientific-technical) activities—applied research and technical-economic justification; 2) design (project) activities—designing, creating, and testing prototypes of technical devices, developing manufacturing technology, and preparing project documentation; and 3) technological (production) activities—implementing engineering developments in the practical activities of economic entities with ongoing technical support [15].

Thus, engineering is a discipline, profession, and human activity focused on applying scientific and technical advances, using physical laws and natural resources to solve specific human challenges. Engineering involves applying scientific innovations to solve real-world practical problems, fostering inventiveness and innovative skills in specialists [9]. Such skills are crucial in developing high-tech industries and a smart economy in a competitive environment, as competition requires the rapid implementation of innovations in practice.

School-based engineering education and its component, technological education, are achieved by integrating primary and supplemental education across all educational levels [16].

In elementary school, this takes the form of preparatory (propaedeutic) activities (developing young students' experience in interacting with nature, observing and studying natural phenomena with simple data collection and processing tools, building basic material-handling skills, and introducing project principles) [16]. It’s easy to see that engineering education preparation involves studying "Technology" and "Robotics."

In middle school, initial design and technology knowledge and skills development (gaining experience in applying physical, chemical, and biological methods to study natural objects and phenomena, basic planning skills, construction, modeling, and familiarity with 3D modeling, robotics, electrical engineering, electronics, and programming). Engineering education in middle school primarily takes place through the subjects "Technology," "Robotics," and "Computer Science and ICT" [14].

In high school, career orientation (mastering technology for solving creative tasks, modeling, design, prototyping, and programming; learning basic algorithms and project-research engineering activities; participating in engineering competitions and festivals) [16]. High school engineering education focuses on project-based methods aimed at solving specific industrial tasks in collaboration with universities and industries.

The result of engineering education is the development of engineering thinking in students.

The role of STEM in schools is to integrate the innovative potential of subjects like "Technology," "Robotics," and "Computer Science & ICT," as well as to modernize the content of STEM subjects to meet the requirements of engineering-technological education and digitalization. Experience with the TRIZ (Theory of Inventive Problem Solving) concept in certain schools shows that developing students' engineering and technological skills in middle school is both possible and necessary. Thus, the STEM approach primarily proposes a systematic integration of a new engineering-technological aspect of education into schools, built on a digital platform [5].

In traditional education, STEM subjects such as physics, mathematics, chemistry, biology, and computer science are taught separately, with no crossover in content, leaving fragmented information in students' memories. The subject area "Technology" helps build logical connections between these disciplines, offering a global perspective on the surrounding world and enabling deeper understanding of patterns.

If we are preparing students for life after school, we must allow them to use tools that will inevitably become part of their daily lives. Therefore, to develop engineering and technological skills, it’s essential to study robotics, technology, computer science, ICT, design, and graphics in school, along with elective courses in 3D modeling, engineering graphics, and more.

Thus, STEM education involves:

1. Transitioning from purely fundamental learning in STEM subjects to practical applications of scientific knowledge for solving real-life problems;
2. Enhancing applied, practical, and laboratory-experimental components in STEM subject content;
3. Defining the content of "Technology" by integrating STEM subjects, computer science, and robotics for phased mastery of various technologies and development of engineering-technological skills;
4. Utilizing robotics to establish the foundations of digital engineering in laboratory and experimental work within STEM subjects [9].

The STEM approach, like other innovative educational trends, meets the challenges of the industrial-digital era, requiring a solid scientific-methodological foundation and a proven didactic platform for widespread classroom implementation.

Work [13] presents a concept for gradually introducing students to engineering-technological knowledge through robotics and computer science:

- Phase 1: "Play" (Grades 1-4) – Students learn basic algorithms and how to assemble and program robots in a playful format, using programs like Scratch, Lego WeDo, Paint, and Paint3D. Students explore the world, make initial observations, and understand the link between the real and virtual.
- Phase 2: "Learn" (Grades 5-7) – Students study programming with ROBOTS and Arduino and learn to work in Unity. Integrated subject content includes math, computer science, physics, chemistry, and art, using platforms like Unity, Scratch 3, ArduinoIDE, RobotC, Lego Mindstorms, and circuitry.
- Phase 3: "Create" (Grades 7-10) – Students design and build school projects, participating in WorldSkills and other competitions, with integrated subject content including math, computer science, physics, chemistry, biology, and drafting. Students learn Python and use robotics to design and build robots: wheeled, tracked, and walking.
- Phase 4: "Invent" (Grades 11-12) – Students create scientific projects and participate in national and international competitions, engaging in project-based work, often collaboratively. Students develop their own projects, participate in scientific-technical competitions, and understand how to implement their ideas.

Best practices abroad and domestically show that "Computer Science & ICT" should be integrated with "Robotics." As a subject that builds foundational engineering-technological skills, "Robotics" is studied through the elective part of the curriculum. Programming languages such as Scratch, Python, Java, and C++ are used to control robots that students build themselves. Overall, "Computer Science" from Grades 1 to 11 should be integrated with "Robotics" through programming modules, with a progression from Scratch and Lego Wedo in Grades 1-4, Scratch and Lego Spike Prime in Grades 5-6, Scratch and Python with Lego MindStorms EV3 in Grades 7-9, to Python, Java, and C++ with Arduino and Lego Tetrix Prime in Grades 10-11. This integration makes computer science an applied discipline, emphasizing ICT's critical role in digitalization and robotics across various sectors [5,17].

The STEM approach aims to enhance the practical, applied, and laboratory-experimental content in STEM subjects to support a cross-disciplinary learning approach for solving project and research tasks. It also requires equipping schools with STEM labs.

STEM calls for replacing the subject "Arts and Crafts" with "Technology" from Grades 1-11, as "Technology" achieves not only traditional labor education goals but also fosters engineering-technological skills by studying design, modeling, and material processing methods to create new quality products.

Traditional labor education builds hands-on skills where students create products based on instructions. In contrast, "Technology" also builds such skills but focuses on scientifically-based principles for creating high-quality new products. In the former, students are workers-performers; in the latter, they are creators-developers.

A distinctive feature and novelty of the updated national educational standard should be the introduction of a new "Technological" profile in high school. Developed countries, as well as Russia and Belarus, have such a profile.

The technological profile [5,17] shifts from subject-based to project-based learning, aiming to solve real-world applied problems across various domains. Curriculum options include industrial-technical, agro-technological, bio-technological, and information-technological directions within this profile, featuring Arduino-based robotics study and robot creation.

Robotics study in each grade should culminate in student competitions to create their own robots. Competitions as a method of organizing learning activities in robotics help cultivate competitive qualities. This method aligns with students' natural tendencies toward leadership and competition, encouraging achievement in peer and teacher relationships and promoting self-actualization, viewed as a method of self-discipline and personal growth.

Thus, in middle school, the main components of STEM education are the subjects "Technology," "Computer Science," and "Robotics." The current curriculum includes "Technology" and "Computer Science" for Grades 1-9 with weekly allocations of two hours and one hour, respectively [13,14]. As noted, "Robotics" is studied for one hour per week through the elective part of the curriculum.

The "Technology" curriculum includes:

1. Mastery of various technologies: traditional crafts, woodworking, metalworking with ICT use, 3D modeling, CAD, etc.;
2. Mastery of design, modeling, and creative/additive technologies;
3. Development of technical work skills.

The "Robotics" curriculum includes:

1. Mastery of robot construction methods using resource kits;
2. Learning robot control methods (from simple to automated) through programming languages such as Scratch, Python, Java, and C++ as programming becomes more complex;
3. Creation of original robot models, participation in competitions to develop engineering-technological skills.

At the profile level in secondary education, STEM learning integrates natural sciences, technology, engineering, and ICT into a cohesive system to solve real-world applied problems.

Pre-profile preparation and profile-level STEM education should be based on the analysis of the Atlas of New Professions, continuously updated with predictions of future jobs. The future job spectrum will be shaped by digitalization and robotics, rapidly entering all human activities. Thus, transforming education based on STEM fundamentally changes career guidance in schools, aligning it with the fast-changing demands of the job market. STEM education provides students with new competencies essential for mastering their future professions effectively. This suggests that universities in Kazakhstan should radically restructure their activities to identify the most promising fields based on the Atlas of New Professions [5,8,17].

STEM education, supported by the Atlas of New Professions, enables the implementation of Skills Technology Foresight, meeting 21st-century business, industry, and government requirements for developing a competitive workforce.

Analyzing leading practices abroad shows the importance of systematic pre-profile preparation in upper secondary school and profile education in high school. Future society (Society 4.0 with Industry 4.0) requires the mandatory inclusion of a technological profile in profile

education to develop students' engineering-technological competencies. This profile involves integrated subject content and elective courses focused on solving applied, engineering-technological tasks with digital components. It also requires collaborative networks between education and industry, establishing the foundation for dual education in schools [5,17].

STEM profile education shifts from subject-based to project-based (phenomenon-based) learning, solving real applied tasks across fields like manufacturing and medicine. The project-research method is widely used, with projects completed individually or in teams.

The knowledge and skills students gain in middle school STEM subjects allow for complex project-based tasks in the "Technological" profile, addressing real industrial challenges. These challenges are solved through projects and school-industry networks involving supplementary education, vocational education, universities, and production [5,17].

Dual education methods are applied in solving production tasks at industrial sites, supporting effective career guidance in schools.

According to foreign experience, STEM profile graduates are guaranteed admission to engineering-technological universities (3.0 or 4.0) [18,19].

University-industry networks and dual education guarantee employment for university graduates in partner companies.

In summary, the STEM approach modernizes traditional education by effectively implementing activity-based, competency-based, and digital approaches, strengthening the engineering-technological (applied and practical) focus of content by introducing "Technology" and "Robotics" with a predominantly project-based approach. STEM fosters strong motivation for students to study STEM subjects.

The future of economic growth largely depends on qualified engineering personnel, and forming such personnel should start in secondary school by supporting and actively introducing STEM disciplines. Preliminary experiences show that the most effective didactic tool for implementing STEM education is a three-dimensional instructional system [5,12].

Transforming secondary education in Kazakhstan based on STEM requires a new "Technological" profile in the curriculum. This profile emphasizes project-based learning and collaboration among schools, extracurricular organizations, universities, and industry. Such collaboration fosters STEM competency in students, creating a progressive workforce foundation for Industry 4.0, enabling Kazakhstan to become an economically advanced, competitive country.

Analyzing international best practices shows that only STEM-modernized education and science form the foundation for sustainable development in any 21st-century nation [1,2,3,4,5,17]. (See Fig. 1).

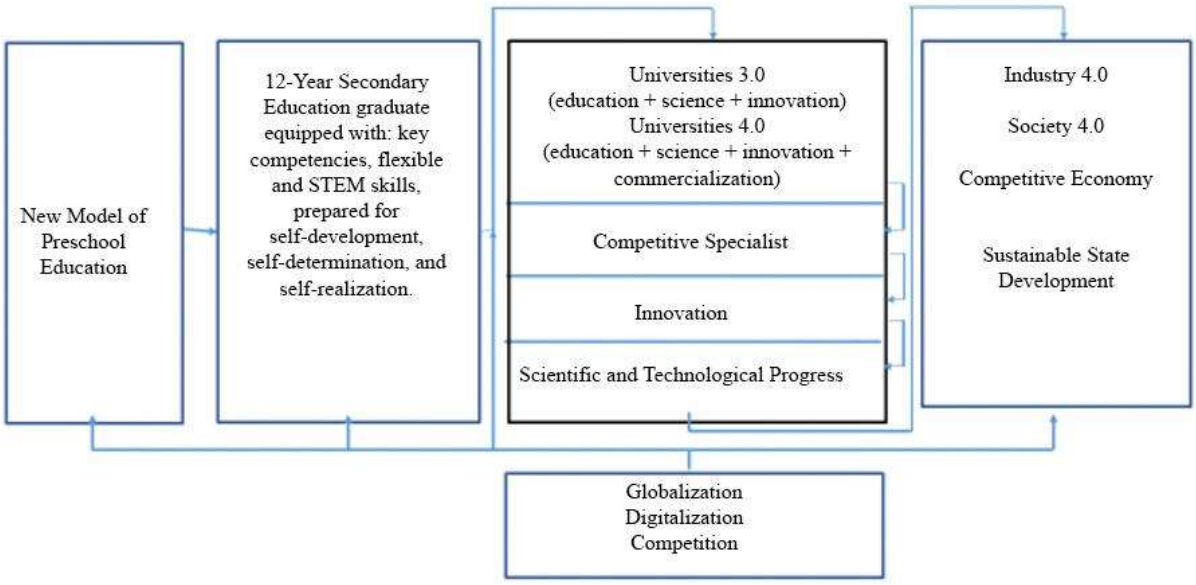

Figure 1 – Education and Science, Modernized through the STEM Approach – A Foundation for Sustainable National Development.

The digital and STEM approaches are modern trends in the education system, stemming from Industry 4.0 requirements for the entire education sector. In developed countries with competitive high-tech digital industries (economies), education systems have been modernized based on digital and STEM approaches. This modernization focuses on preparing a competitive human capital base capable of meeting the challenges of the industrial-digital era of human development [1,2,3,4,5,17].

Transforming secondary education based on the STEM approach requires developing a specialized implementation plan for this modernization. We have developed a project plan to introduce the STEM approach into Kazakhstan's secondary education system [17]. Experiences from countries with Industry 4.0 regarding the implementation of STEM education show its strategic importance in training modern engineers and technologists, essential for creating a digital (smart) economy and competitive high-tech industries. For Kazakhstan, which aims to join the ranks of developed countries, transforming the entire education system based on the STEM concept is an urgent priority.

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THE ROLE OF MOTHER TONGUE İN CHİLDREN'SDEVELOPMENT

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"Mother language is the spiritual vitality of the nation. Just as mother's milk is the fluid of the body, the mother tongue is the food of the soul." These sentences of Firudin Bey Kocherli, who fought for the protection and development of our language, reflect how important the mother tongue is in the formation of a nation. Language is not only a means of communication, it is one of the most important elements that create a nation, shape people, develop them as personalities, and form the basis of culture.

It is no coincidence that one of the main motives of the political strategy of Heydar Aliyev and his successor, Mr. President Ilham Aliyev, is the "Issue of the Mother Tongue". This opinion expressed by the national leader confirms how important language is for the existence of a nation: "Those who have a developed rich language culture The nation is inflexible, immortal, and has a great future."

The head of state Ilham Aliyev has taken a number of steps in this field and has created favorable conditions for solving problems by approaching our mother tongue, national traditions, and ancient culture with great sensitivity.

Children should be instilled with love for their mother tongue from infancy. They should know that the Azerbaijani language, one of the most beautiful languages in the world, is their mother tongue. This process should be started when the child is in the mother's womb. Research shows that the child hears the surrounding sounds while in the mother's womb, and after birth, it is easier to recognize the language that the mother communicated during pregnancy. , learns and opens language more easily. The child maintains emotional communication until he opens his tongue. This period is considered a period of preparation for acquiring speech, and it is very important for the adults around him to use his mother tongue during that period. This has a positive effect on both the cognitive development of the child and the formation of correct speech in them.

Expressing their thoughts, feelings, and emotions in their mother tongue during the formation of the habit of communication is the main condition for the general development of the child. By mastering the beauties of the mother tongue, children can express their thoughts correctly, freely, accurately and delicately, and this leads to the correct use of language when communicating with people, leads to a clear perception. With the help of his mother tongue, the child acquires certain ideas about the surrounding world, which plays a role in enriching his vocabulary and forming ideas about things and events. Children learn basic knowledge about the surrounding world, human experience passed from generation to generation, communication skills with the help of speech from parents and teachers who are important in their development.

The acquisition of the mother tongue first begins in the family. From this point of view, the first language taught should also express and serve a person's own genetic code, so the first language a child communicates with should be his native mother tongue - the language of the nation he belongs to. It also depends on the family where the baby grows up. Parents raising the next generation should be sensitive in this matter and should not neglect their mother tongue. Because in the education and upbringing of the growing generation, in their development as a real citizen, the first language they acquire in their education has a great importance and influence.

In order to preserve the purity and correctness of our mother tongue, enrich it and develop, we must first use our language in accordance with the norms of literary language.

Both in the family and in the educational environment, we should use our native words included in the lexicology of the mother tongue, we should be more engaged in artistic recitation in the Azerbaijani language. For this, we should promote reading habits in children from an early age. , listening to their old tales and legends, they experience the beauty of our homeland in artistic examples. The lullabies, caresses, and caresses sung by mothers and grandmothers for babies not only form aesthetic taste, but also increase cognitive activity.

The mother tongue is the leading force of the mental and moral education of preschool children. A child who starts speaking at the age of two develops his speech exactly at the age of 6-7 and communicates with the people around him, and nothing can replace the mother tongue during this period. The basis of speech development is the correct mastering of the mother tongue, which is an important condition for the formation of an intellectually and morally developed personality who has mastered the culture of speech, is able to express his thoughts competently and logically.

Since language is the basis of culture, learning the mother tongue forms aesthetic education and cultural feelings. When a child acquires speech skills in the mother tongue, a gentle attitude towards nature, people, society and art is instilled in him. The mother tongue has the characteristic of shaping aesthetic taste as a means of cultural development.

Using the mother tongue as a means of communication, which is the leading means of cultural and spiritual development, the child learns about the culture of his generation, the world around him and himself.

In addition to teaching and learning, the work on mastering the mother tongue serves the moral education and mental development of children. With the help of the mother tongue, children are educated to love our native country, the beauties of our country, the customs and traditions of our people, respect and loyalty to the truth, justice. Therefore, in order to build a healthy future and educate patriotic young people, we must love our mother tongue and pass it on to the next generations in a pure way by making the future generations love it.

Protecting the language is the duty of every representative of the nation. There is no future for a nation that does not protect its language. The first step in protecting the purity of the mother tongue is to teach children their mother tongue from infancy. This step, along with protecting the language, plays an important role in the development of the child's thinking and formation as a person worthy of the motherland.

MÖVZU: THE EXPERİMENT OF SUGGESTPEDİA METHOD İN THE TEACHİNG PROCESS

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Açar sözlər:ətraf mühit, təklif, prinsip, öyrənmə, öyrətmə, tələbə
Keywords:environment:,suggestion,principle,learning,teaching,student
Ключевые слова: среда:,предложение,принцип,обучение,преподавание,студент

1.Introduction

Bulgarian educator Lozanov, suggestopedia is a foreign/second language teaching method that focuses on accelerating the learning process by providing students with a comfortable classroom environment . Lozanov believes that applying suggestopedia to foreign/second language teaching can speed up language learning three to five times compared with traditional teaching methods. However, according to Scovel, suggestopedia is pseudoscience without scientific basis According to Larsen, et.al. (2001: 81-83), the principles of Suggestopedia method are as follows:

1.The goal The term 'Suggestopedia', derived from suggestion and pedagogy, is often used loosely to refer to similar accelerated learning. The goal is to accelerate the process of language learning. In order to achieve this goal, the students' psychological barriers must be minimized. And the students' mental power must be maximized. Learners have commonly set a limit on their abilities. For instance, students may say, "Oh, it's too late for me, I am too old," or "How can I remember that amount? Nobody can!"

2. The role of the teacher and the students. The relationship between the teacher and the students is like parents and children. The teacher is the authority in the classroom. He is sources having great authority. The students will retain information better from someone in whom they have confidence. Once, the students trust the teacher, they can feel more secure, they can be more spontaneous and less inhibited.(1,89)

3.Characteristics of the teaching/ learning process The teaching- learning process of suggestopedia instruction is "learner-centered". The learning climate is established that is free from anxiety and cooperation within the group is perceived as supportive. The consciously designed learning environment, consisting, for example, of a bright, cheerfully decorated room, flowers, and a seating order which allows eye-contact among learners as well as maximum freedom of mobility is designed to increase the joy of learning and to create a positive learning environment. The learner is able to practice the material in a playful manner in order to be able to apply it freely and creatively in new contexts. These exercises are designed to promote learning through life-like contexts.

4.The nature of student-teacher, student-student interaction. The teacher initiates interactions with the whole group of students and with individuals from the beginning of the course. Later, the students initiate interaction themselves.

5.The feelings of the students. Students are encouraged to be as "childlike" as possible, yielding all authority to the teacher. Students thus become "suggestible" .A great deal attention is given to students' feelings. One of the fundamental principles of the method is enhancing the students' feelings of relax and confidence.(4,12)

6.The language skills that are emphasized. Speaking communicatively is emphasized.

7.The role of the students' native language. Native-language translation is used to make the meaning of the dialog clear. The teacher also uses the native language in the classroom when necessary. As the course proceeds, the teacher uses the native language less and less.
8.The way the evaluation is accomplished .Evaluation is usually conducted on students' normal in-class performance and not through formal tests, which would threaten the relaxed atmosphere considered essential for accelerated learning
9. The way the teacher responds to student errors. Errors are corrected gently, with the teacher using soft voice.

2.The procedure of suggestopedic

Georgi Lozanov states that learning is a matter of attitude, not aptitude. Some of the key elements of Suggestopedia include a rich sensory learning environment (pictures, colour, music, etc.), a positive expectation of success and the use of a varied range of methods: dramatised texts, music, active participation in songs and games, etc. Suggestopedia uses four main stages as follows: (2,19)

1.Presentation It is a preparatory stage in which students are helped to relax and move into a positive frame of mind, with the feeling that the learning is going to be easy and fun. Physical exercises, mostly muscle tensing and relaxing, mind calming with music are done. Students are relaxed and immerse themselves in soft classical music while they visualize themselves first in a safe, calm place away from the classroom, then see themselves learning lesson material quickly and easily. After three or four minutes of this activity, the students return to their usual attentive state of awareness.
2.First Concert - "Active Concert" The instructional setting will be look like a living room, using a central round table and ordinary arm chairs surrounding the table. The classroom is bright and colorful. There are several posters on the wall. Some of them contain grammatical and vocabulary information. The teacher is lively, dynamic, confident, yet sensitive. All learners choose a new name and nationality, after which they are given a fictional autobiography. By means of song, imitation, and play, the learners are enabled to introduce themselves to each other and assume their new roles (Murcia, 1991: 42). This involves the active presentation of the material to be learnt. The teacher introduced the new dialogue for the week, reading the material aloud in a dramatic manner, pausing to translate new vocabulary as necessary. He reads the text at a normal speed, sometimes intoning some words, and the students follow. Then, it is followed by various kinds of activities: group or choral reading of the parts of the script, role play, singing , playing games .It uses lively pieces of classical music.(5)
3.Second Concert - "Passive Concert" In this step, a state of relax is created. The students put down the script, close their eyes. The students are now invited to relax and listen to some Baroque music, with the text being read by the teacher very quietly in the background. The music is specially selected to bring the students into the optimum mental state for the effortless acquisition of the material. Suggestopedia uses baroque music pieces in the second or "passive" concert session, it never uses a "slow baroque" or a music piece written as "adagio". It is simply because Suggestopedia does not want students to fall asleep in the concert session. Rather, it uses faster and livelier pieces to stimulate a whole brain. At the end of this passive concert, the students leave the classroom silently
4. Practice In this stage, the students finish off what they have learned with dramas, songs, games, puzzles, etc. to review and consolidate the learning. The students sing classical songs and play games, etc. while "the teacher acts more like a consultant." The students spontaneously speak and interact in the target language without interruption or correction.

Advantages of Suggestopedia

Though we don't have much data to support the overall effectiveness of Suggestopedia, we do know that some aspects of it can be great for teaching language.

Music can facilitate learning

Music can reduce stress, assist in managing behavior and inspire creativity. It also enhances concentration, making it easier for students to focus challenging activities.

The environment helps students relax

It's easy to downplay or forget the importance of a comfortable and secure classroom space. The Suggestopedia method emphasizes a safe, comfortable space in which students feel at ease and in which they enjoy learning. In the right environment, students feel safe and cared about, which creates a positive learning experience. Physically, they have easy access to materials and resources that they need. Emotionally, they feel comfortable to take risks without fear of judgment or ridicule.

Reading out loud helps students remember new content

Reading a text or a dialogue to your students, as prescribed by the Suggestopedia method, is a wonderful way to pre-teach new vocabulary and review important material at the end of a lesson.Reading with dramatic flair, as if you were part of a theatrical performance, can make the experience more **engaging and enjoyable.** As a result, students are more likely to pay attention.

Disadvantages of Suggestopedia

Despite its obvious advantages, Suggestopedia *does have* a few drawbacks. Here are some things to consider before diving head-first into a Suggestopedia-driven lesson.

The wrong music can be a distraction

Studies show that music can actually hinder certain tasks, including memorization.

For the most part, it's music with lyrics that cause distractions. But some students also get distracted by music that they don't particularly like. In situations like this, Suggestopedia can do more harm than good. It's important to keep this in mind when considering Suggestopedia as a teaching style. After all, it's unlikely that every student in your classroom will like the same kind of music.

Suggestopedia relies on infantilization

In other words, Suggestopedia requires the student-teacher relationship to resemble that of a parent and child for this method to work. The reason is that Suggestopedia relies on the absolute authority of the teacher for the power of suggestion. If you've spent any time in the classroom, you know that not every student is docile enough to regard the teacher as a figure with absolute authority. Some students are more open to suggestion than others, especially as they get older, and others want to challenge or interrogate conflicting views.

Suggestopedia lacks a clear structure

Education experts now know that setting clear, linear goals is a necessary component to successful learning.

Teachers and students need a roadmap showing where they've been and where they're going next. However, the Suggestopedia method lacks the structure to make this goal-setting process happen. For some students who need a more structured learning environment, this teaching style can be confusing or downright overwhelming.

It's not always feasible to use Suggestopedia

Depending on where you teach, it simply might not be practical to furnish your room with armchairs, special lighting and decorations. Moreover, schools that stick to a more traditional educational model may not be receptive to adopting an unorthodox teaching method like Suggestopedia.

Experiment with different kinds of music

Before turning your classroom into a *full-blown concert*, try playing music in the background during various learning activities and take note of how students respond. Do students perform better if a classical piece is played, or does a pop song get them more motivated?

One of my favorites is this three-hour playlist of Mozart piano pieces. Another good choice is to play simple noises in the background, like this 12-hour track of water and bird sounds. Also, notice which types of activities lend themselves well to background music. Your students may find it helps them focus during paired dialogues, but background music could become a distraction as they read silently.

Pay attention to physical elements of your classroom

If you've never given the setup and decor of your classroom much thought, now's a great time to do it. Remember that every detail matters: the seating, lighting, decorations and even the location of objects like bookcases and pencil sharpeners.Everything needs to be arranged in a way that's comfortable and welcoming—try to avoid clutter.While it may not be practical to give every student an armchair to sit in, you might consider creating a comfy corner with a bookcase and a few beanbag chairs.

Read expressive dialogues in the target language

Bring out your inner thespian and give your language life by using theatrical voices, gestures and exaggerated emotions. This will make the vocabulary vivid and memorable, as well as create a fun learning environment for you and your students. If you have a textbook that you already use, you may find some good dialogues there. Or you can expose your students to classic plays in the target language written by renowned playwrights like Shakespeare, Miguel de Cervantes and Molière.

Encourage your students to reach bigger goals

One of the core principles of Suggestopedia is that students will be able to learn large amounts of vocabulary in little time. In fact, Dr. Lozanov insisted that this method would result in students learning the language three to five times faster than they would through other methods. While his claim was never backed up by evidence, the method has helped a lot of students improve their language-learning capabilities. When using Suggestopedia, always be realistic about your classroom objectives and mindful of your students' capabilities, maintaining and communicating high expectations shows that you believe in your students. By encouraging learners to set more challenging goals, you promote a positive learning environment that can motivate the class to work harder.

EFFECTS OF SUGGESTOPEDIC INSTRUCTION

According to Gabriele Beitinger, the design of suggestopedic instruction has positive cognitive, motivational, emotional, and social effects.

1.Cognitive effects: development of knowledge. As explained above, suggestopedic instruction provides learners with learning environments which are comfortable. This is to increase learning resistance, to stimulate learning readiness, to make the learners feel relaxed, to foster hope and trust in their own power, to help the learners overcome the barriers to learning, to facilitate the learners to change input into intake. The students are exposed to situational exercises as well as to the complex, authentic system of the target language. It can be expected that this exposure has an especially positive effect on the development of listening comprehension and the ability to communicate in a foreign language in everyday situations.

2. Motivational effects.

According to the motivational approach, the experience of enjoyment (intrinsic motivation) and competence in learning is the decisive factor in the development of long-term learning motivation. The playful design of many exercises in suggestopedic instruction is likely to produce such kind of experience, e.g. a joy of learning and curiosity. Therefore, we might expect an increase of intrinsic motivation during the course of suggestopedic instruction. As suggestopedic instruction offers frequent opportunities to select the activities according to personal interests or intent to apply the learning, learners should quite often experience the feeling of autonomy and self determination. The manner in which different forms of practice are embedded in rich situational contexts helps the learner understand rather complex remarks even with a limited vocabulary.

Experiences of success such as those are likely to frequently let learners experience a feeling of competence. Thus, overall, suggestopedic instruction can be expected to have positive motivational effects.

3. Emotional effects: Anxiety. In regard to emotional effects, one important way to facilitate the learning process of the learners is to reduce their nervousness and anxious tension. Suggestopedic instruction responds to this emotional need through the frequent use of relaxation exercises as well as through reducing nervousness in movement- oriented exercises. We can therefore assume that suggestopedic instruction has a positive effect on the emotional dimension of the learning process.

4. Social effects. By motivating independent groups of learners to work on a certain subject matter even after a corresponding course has ended ("groups of practice"), self autonomous development of knowledge, especially on a long term basis, is promoted. A positive view of the shared process of learning is vital for the formation of such groups. Suggestopedic instruction frequently uses exercises which provide a high degree of social interaction and authentic communication. It is seen as very important that learners become acquainted with each other. Therefore, we can expect that students in a suggestopedic course will experience cooperation with other students as well as with the instructor in a positive way.

3. Conclusion

From the above discussion, some conclusions can be drawn. The goal of Suggestopedia is to accelerate the process of language learning. The relationship between the teacher and the students in suggestopedic instruction is like parents and children. The teaching- learning process is "learner-centered". The teacher initiates interactions with the whole group of students and with individuals from the beginning of the course. Later, the students initiate interaction themselves. One of the fundamental principles of the method is enhancing the students' feelings of relax and confidence. The student errors are corrected gently, with the teacher using soft voice. Suggestopedia uses four main stages as follows: presentation, active concert, passive concert, and practice. Suggestopedic instruction has positive cognitive, motivational, emotional, and social effects on the learners.

Literature

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Ə.R.Bəşirzadə

Nəticə

Saqistopedik(təklif xarakterli) metodun təlim prosesində tətbiqi

Nəticə olaraq Müəllimin pedaqoji təcrübəni öyrənib özünün fəaliyyətinə gətirməsi və onu tətbiq edə bilməsi mərhələli bir prosesdir. Belə ki, konkret bir müəllim və ya məktəb yenilik kimi gördüyü və onun tətbiqində yüksək nəticələr əldə edə biləcəyinə inamı olduqda onu dərindən öyrənmək və təhlil etməklə özü üçün müəyyən metodika, texnoloji plan hazırlayır. Bu, öyrənməyin birinci mərhələsini təşkil edir. İkinci mərhələdə müəllim yeniliyi tətbiq etmək üçün əlverişli öyrədici

mühit hazırlayır. Belə bir mühit olmadıqda yeniliyi tətbiq etmək və ya ondan müsbət nəticə əldə etmək mümkün olmadığından ona xüsusi fikir vermək olduqca vacibdir. Üçüncü mərhələdə müəllim qəbul etdiyi yeniliyi özünün hazırladığı texnolojiplana əsaslanaraq tətbiq edir. Dördüncü mərhələdə müəllim aldığı nəticələri təhlil edərək ümumiləş-dirmələr aparır, müvəffəq və nöqsan cəhətləri nəzərdən keçirir, müəyyən korreksiyaedici işlər aparır və nəticələr çıxarır. Yenilikçi müəllimin özünün də bu prosesə müəyyən əlavələr və düzəlişlər etməsi, onu özünün yaradıcılığı, yeni fikirləri ilə daha da zənginləşdirməsi pedaqoji prosesin optimallığını artırır və başqa yeniliklərə, yeni bir təcrübəyə də yol açır. Sınaqdan çıxmış və qəbul edilmiş və müsbət qiymətləndirilmiş belə yeniliklər, qabaqcıl təcrübələr bir müəllimin, bir məktəbin çərçivəsindən çıxaraq daha geniş miqyas alır.

А. Р. Баширзаде

Резюме

Применение сагистопедического (суггестивного) метода в тренировочном процессе.

В результате это поэтапный процесс усвоения учителем педагогического опыта, внедрения его в свою деятельность и применения. Итак, когда конкретный педагог или школа видит инновацию и считает, что может добиться высоких результатов при ее применении, он готовит для себя определенную методологию и технологический план, глубоко изучая и анализируя ее. Это составляет первый этап обучения. На втором этапе учитель готовит подходящую среду обучения для применения инновации. При отсутствии такой среды крайне важно уделять особое внимание нововведению, так как невозможно его внедрить или получить от него положительный результат. На третьем этапе преподаватель применяет полученную инновацию на основе подготовленного им технологического плана. На четвертом этапе учитель анализирует полученные результаты, делает обобщения, рассматривает удачные и недостающие стороны, проводит определенные корректирующие работы и делает выводы. Педагог-новатор сам вносит в этот процесс определенные дополнения и корректировки, обогащая его собственным творчеством и новыми идеями, повышает оптимальность педагогического процесса и открывает путь другим инновациям и новому опыту. Такие инновации, передовые практики, апробированные, принятые и положительно оцененные, выходят за рамки одного учителя и одной школы.

A model of strategic management of a university based on project management tools

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ABSTRACT

Universities face increasing pressure to achieve strategic goals in a dynamic and resource-constrained environment. Project management tools offer a structured approach to planning, executing, and monitoring initiatives, potentially enhancing efficiency and effectiveness. However, the potential for integrating these tools within existing university strategic management practices remains underexplored. This research delves into stakeholder perspectives on project management integration in universities, it means that highlighting the importance of understanding the viewpoints of university leaders, project management experts, faculty, and students regarding project management integration.

Employing a multi-methodological approach, the study utilizes in-depth interviews, online surveys, and focus groups to gather data from key stakeholders including university leaders, project management experts, faculty representatives, and students. Thematic analysis will be used to analyze interview transcripts, exploring stakeholder experiences and perspectives on current strategic management practices, project management principles, and their anticipated benefits and challenges of integration. Quantitative analysis of online survey data will capture broader trends and opinions across the university community regarding strategic management and project management integration. Focus group discussions will facilitate a collaborative exploration of specific themes identified through the initial data collection phases.

By triangulating the findings from these diverse data sources, the research aims to achieve a comprehensive understanding of stakeholder perspectives. The findings will illuminate the potential benefits and challenges of integrating project management tools within university strategic management. This knowledge will contribute to the development of evidence-based recommendations and strategies for successful implementation, ultimately fostering a more efficient and effective approach to achieving strategic goals in universities. Additionally, this research can inform the development of training programs and support structures to facilitate a smooth transition and maximize the potential benefits of project management integration within the unique cultural and structural context of universities.

Key words: project management, university, strategic management, culture, communication and collaboration.

INTRODUCTION

The landscape of higher education is witnessing a rapid transformation. Universities, traditionally anchors of stability and long-term planning, are now caught amidst a vortex of change and intensifying competition. Traditional strategic management approaches, often characterized by compartmentalization and resource-intensive processes, are found wanting in this dynamic environment. Strategic management can be defined as refers to the university's high-level planning and decision-making processes for achieving its long-term goals. A novel framework is therefore required, one that prioritizes agility, accountability, and focused action.

This dissertation work proposes a paradigm shift- a model of strategic management for universities that draws inspiration from the rigor of project management methodologies. Here, strategic objectives are meticulously decomposed into discrete projects, each possessing clearly defined deliverables and subject to dedicated planning, execution, and monitoring. This project-centric approach offers several distinct advantages.

Firstly, it fosters clarity and alignment. Fuzzy goals are replaced by well-defined projects with tangible outcomes, ensuring a direct translation of resources towards achieving specific objectives. Secondly, it promotes efficiency and responsiveness. Project management tools, such as resource allocation frameworks and performance measurement dashboards, enable effective control over resource utilization and timely course correction when necessary. In this case, resource allocation identified as efficient allocation of resources across various strategic initiatives within the university. Thirdly, it cultivates a culture of collaboration and accountability. Cross-functional teams unite around shared project goals, leading to improved communication, a heightened sense of ownership, and enhanced transparency.

In the following sections of this thesis, in a future year and a half, we examine this model in three stages. Firstly, the rationale and theoretical underpinnings for adopting a project-based approach are established. We delving into the limitations of traditional strategic management methods and demonstrate how project management tools serve as a remedy for these shortcomings. Secondly, the model itself is dissected, with particular attention given to its core components: strategic objective translation into projects, project prioritization and portfolio management, project execution and monitoring frameworks, and continuous evaluation and adaptation. Finally, the practical implementation of this model is considered, addressing potential challenges and outlining strategies for successful integration within university structures.

The Value and Importance of Project Management in University Strategy

Universities, once viewed as bastions of tradition and measured progress, now navigate a dynamic landscape characterized by rapid change, intensifying competition, and evolving student needs. In this context, traditional strategic management approaches, often reserved and resource-intensive, struggle to maintain agility and effectiveness. This necessitates a fresh perspective, one that fosters clarity, focus, and responsiveness. This paper explores the value and importance of project management, a rigorous and adaptable framework, as a powerful tool for steering university strategy in the 21st century.

The limitations of traditional strategic management in universities are manifold. Strategic goals, often broad and aspirational, lack the granularity and immediacy necessary for actionable implementation. Resource allocation remains opaque, with funding dispersed across disparate initiatives, leading to inefficiency and diluted impact. Furthermore, accumulated structures and fragmented communication often impede collaboration and accountability, hindering timely course correction and adaptation.

Project management offers a compelling alternative. It translates overarching strategic objectives into discrete, well-defined projects, each with clearly articulated deliverables, timelines, and budgets. This clarity and alignment directs resources towards tangible outcomes, ensuring focused effort and a measurable return on investment. Additionally, project management tools, such as resource allocation frameworks and performance dashboards, enable transparent and efficient resource utilization. Progress is monitored meticulously, allowing for course correction and adaptation in response to changing circumstances or unforeseen challenges.

Beyond these structural advantages, project management fosters a culture of collaboration and accountability. Cross-functional teams coalesce around shared project goals, leading to improved communication, shared ownership, and enhanced transparency. This collaborative environment empowers faculty, staff, and students to actively contribute to the university's strategic direction, harnessing diverse perspectives and expertise.

The benefits of integrating project management into university strategy are multifaceted and substantial. Enhanced responsiveness and agility enable universities to capitalize on emerging opportunities and navigate unforeseen challenges effectively. Improved focus and resource allocation optimize resource utilization, maximizing the impact of investments on strategic objectives. Greater transparency and accountability build trust and confidence among stakeholders, strengthening internal cohesion and external reputation. Moreover, a culture of collaboration and innovation drives continuous improvement and fosters a dynamic learning environment within the university.

Implementing a project-based approach within a university structure requires careful consideration and strategic planning. Potential challenges include overcoming resistance to change, adapting existing workflows, and building capacity for effective project management practices. However, these challenges can be mitigated through comprehensive communication, targeted training initiatives, and the selection of appropriate project management tools tailored to the university's specific needs.

Current Practices and Potential Strategies

Universities today face a turbulent environment characterized by rapid change, intensifying competition, and evolving student needs. Traditional strategic management approaches, often stored and resource-intensive, struggle to respond effectively to this dynamic landscape. This necessitates a paradigm shift – the integration of project management, a rigorous and adaptable framework, into university strategic planning. However, to fully explore the potential of this integration, we must first understand the existing landscape of university strategic management practices and identify potential opportunities for seamless integration.

Traditional university strategic management typically revolves around three key pillars, such as:

Goal-setting and Planning. Long-term and short-term goals are established through collaborative efforts involving senior leadership and stakeholders. Frameworks like SWOT analysis and Balanced Scorecards are frequently utilized to identify strengths, weaknesses, opportunities, and threats (SWOT), while key performance indicators (KPIs) track progress towards goals.

Resource Allocation. Budget allocation follows established departmental structures, with decisions made at various levels (central administration, faculties, departments). While cost-efficiency is considered, resource allocation might not directly correlate with strategic priorities.

Performance Measurement and Evaluation. Progress is monitored through various metrics like student enrollment, graduation rates, research output, and faculty quality. Periodic evaluations (annual reports, external reviews) assess achievement of goals and inform future strategies.

While these traditional approaches have served universities well for decades, their limitations become increasingly apparent in the current dynamic environment. Saved structures hinder agility and collaboration, resource allocation lacks transparency and direct alignment with strategic goals, and measurement methods often focus on outputs rather than impactful outcomes.

The research objective

To develop and evaluate a model of strategic management for universities based on project management tools.

The labyrinthine world of university strategic management often faces challenges in translating aspirations into tangible outcomes. This research aims to illuminate a novel path forward by developing and evaluating a model of strategic management for universities built upon the robust tools and frameworks of project management.

This transformative approach seeks to bridge the gap between strategic planning and implementation. Traditional university management models, while offering valuable frameworks, can struggle with operationalizing goals and ensuring efficient resource allocation. Project management, conversely, provides a structured, data-driven methodology for breaking down

complex objectives into manageable tasks, ensuring timely completion, and fostering effective collaboration. By integrating the strengths of both worlds, this research endeavors to:

1. Develop model will seamlessly embed project management tools and methodologies within the university's strategic management framework. This integration will tailor project management practices to the unique contexts and needs of universities, ensuring a holistic and sustainable approach.
2. Rigorous evaluation methods will be employed to assess the impact of the model on key performance indicators. This includes measuring its influence on strategic goal achievement, resource utilization, project success rates, and stakeholder engagement. The research will identify success factors, challenges encountered, and opportunities for refinement.
3. The developed model and its evaluation findings will be disseminated through scholarly publications, conference presentations, and university workshops. This knowledge sharing aims to encourage widespread adoption of the model, ultimately contributing to the advancement of strategic management practices within higher education.

Research Questions

Guiding our investigation will be specifically formulated research questions targeting key aspects of PM integration in university strategic management. Questions formalized on the basis of research papers.

1. How does implementing PM frameworks influence resource allocation within universities? (Smith & Lewis, 2011)
2. What are the primary challenges and obstacles encountered during PM integration in USM contexts? (Caldwell & Baldwin, 2008)
3. To what extent does PM contribute to enhanced student satisfaction and engagement in universities? (Jones et al., 2014)

LITERATURE REVIEW

The integration of project management into university strategic management is gaining traction as a promising approach to navigate the dynamic landscape of higher education. This section provides an overview of the existing academic discourse on this topic, analyzing relevant research and exploring how universities are leveraging project management tools to enhance their strategic effectiveness.

The world of project management presents a symphony of diverse methodologies, each equipped with unique strengths and approaches. At the forefront of adaptability stands Agile, championed by Highsmith (2009). Favoring iterative development and rapid adaptation, agile methodologies have demonstrably thrived within dynamic university environments, particularly in research projects and technology development initiatives, as Jones et al. (2014) highlight.

Juxtaposed against the flexibility of agile stands the structured rigor of the Waterfall approach. This sequential, phase-gated methodology, as outlined by Royce (1970), offers universities invaluable control and predictability for large-scale projects, such as construction endeavors or curriculum development.

Recognizing the merits of both approaches, universities are increasingly leaning towards Hybrid Models. By strategically adapting methodologies to specific project contexts, these hybrid approaches foster enhanced flexibility and efficiency, a trend further explored by Al-Hashimi and Drew (2018) in their investigation of resource management within UAE universities.

Theoretical Foundations

The theoretical underpinnings of integrating project management into university strategic management draw from various disciplines. Notably, strategic management frameworks, such as the Balanced Scorecard (Kaplan & Norton, 1996) and SWOT analysis (Ackoff, 1989), provide a

foundation for setting clear goals and aligning resources with strategic objectives. Additionally, project management methodologies, including agile (Highsmith, 2009) and waterfall (Royce, 1970), offer frameworks for planning, executing, and monitoring projects, ensuring efficient resource utilization and timely delivery of desired outcomes.

Empirical Research

Several studies have investigated the application of project management in universities, offering valuable insights and evidence of its potential benefits. For example, a study by Smith and Lewis (2011) found that universities implementing a project-based approach to strategic management experienced increased stakeholder engagement, improved resource allocation, and a stronger focus on achieving desired outcomes. Similarly, Jones et al. (2014) demonstrated that universities adopting agile project management methodologies witnessed enhanced communication, collaboration, and adaptability in response to changing environmental factors.

International Perspectives

The trend of integrating project management in university strategic management is not confined to specific regions. Research by Park et al. (2017) explored the experiences of Korean universities and identified a positive correlation between project management implementation and improved research productivity, student satisfaction, and overall institutional performance. Similarly, a study by Al-Hashimi and Drew (2018) examined universities in the United Arab Emirates and found that adopting project management frameworks led to increased efficiency, transparency, and accountability in resource management.

Challenges and Considerations

While the potential benefits of integrating project management are promising, several challenges and considerations must be addressed for successful implementation. These include overcoming resistance to change within existing university structures (Caldwell & Baldwin, 2008), developing appropriate training programs for faculty and staff (Baccarini, 1999), and selecting suitable project management tools and methodologies aligned with the specific needs of the university (D'Onofrio et al., 2014).

Limitations and Gaps in Existing University Strategic Management Approaches

Universities, as complex organizations juggling diverse stakeholders and objectives, face the perpetual challenge of translating lofty strategic aspirations into tangible outcomes. While established strategic management models offer valuable frameworks, navigating the intricacies of academic life often necessitates venturing beyond conventional approaches. This essay critically examines limitations and gaps in existing university strategic management models, paving the way for exploring transformative avenues like integrating project management tools.

The Balanced Scorecard (BSC), championed by Kaplan and Norton (1996), stands as a testament to the need for holistic performance assessment. By encompassing perspectives beyond financials, such as learning and growth, internal processes, and customer relationships, the BSC provides universities with a valuable roadmap for aligning strategic goals with operational activities (Smith & Lewis, 2011). However, its strength in providing a comprehensive overview can occasionally translate into a tendency towards vagueness, necessitating additional frameworks for operationalizing goals into concrete action plans (Bourne & Bryson, 2005).

Similarly, the SWOT Analysis, encompassing Strengths, Weaknesses, Opportunities, and Threats, offers a potent tool for strategic planning (Ackoff, 1989). Its effectiveness in guiding universities to internally assess capabilities and navigate external challenges (e.g., competitive landscapes, evolving student demographics) is undeniable. Nevertheless, critics point to its inherent subjectivity and potential for fostering reactive rather than proactive strategies (Grant, 2016). Additionally, universities can struggle to translate SWOT analysis insights into actionable steps unless coupled with robust implementation frameworks.

Moving beyond individual models, Portfolio Management offers a strategic lens for prioritizing resources. Caldwell and Baldwin (2008) advocate for categorizing university initiatives based on risk and return, akin to financial portfolio theory. While this approach ensures efficient resource allocation, it risks neglecting initiatives with potentially high social impact but lower projected financial returns (Clark, 2010). Furthermore, universities implementing portfolio management can face challenges in balancing short-term financial considerations with long-term strategic investments in areas like research and student development.

These limitations call for exploring alternative approaches that bridge the gap between strategic planning and effective implementation. This is where project management methodologies emerge as a promising avenue. Agile, waterfall, and hybrid models, each with their distinct strengths and weaknesses, offer universities structured tools for breaking down goals into manageable tasks, ensuring timely completion, and fostering effective collaboration (Highsmith, 2009; Royce, 1970). Research, such as Park et al.'s (2017) study demonstrating increased research productivity in Korean universities after implementing project management, highlights the potential of these tools to translate aspirations into tangible outcomes.

However, integrating project management within universities presents its own set of challenges. Lack of awareness and training among faculty and staff, resistance to change within established structures, and adapting methodologies to the unique nuances of academic contexts are hurdles that need to be addressed. Further research is necessary to explore best practices for overcoming these challenges and maximizing the potential of project management in university settings.

Overall, while existing university strategic management models offer valuable frameworks, limitations and gaps remain. Addressing these shortcomings necessitates venturing beyond conventional approaches and exploring transformative avenues like integrating project management tools. By critically examining the strengths and weaknesses of existing models, coupled with further research into innovative integration strategies, universities can forge a path towards a future where strategic aspirations seamlessly translate into tangible outcomes, contributing to academic excellence and societal progress.

METHODOLOGY

Brief overview of the methodology

Research, the engine of knowledge advancement, thrives on a well-defined methodology. It acts as the roadmap, guiding us from a burning question to a robust understanding. A strong methodology ensures data collection is rigorous, analysis is objective, and ultimately, our findings contribute meaningfully to our chosen field.

At the heart of methodology lies the overarching research paradigm, the philosophical lens through which we view our topic. Broadly, two main paradigms exist: positivism and interpretivism. Positivism assumes an objective reality, independent of the observer. Researchers following this approach aim to discover universal truths through quantitative methods like surveys and experiments. Interpretivism, on the other hand, emphasizes the subjective nature of experience. Researchers within this paradigm explore how individuals interpret and make sense of the world, often utilizing qualitative methods like interviews and focus groups. The specific approach we choose depends on our research question and the type of data we seek. Common research approaches include quantitative research, which relies on numerical data to test hypotheses and identify statistical relationships, and qualitative research, which explores experiences, meanings, and perspectives through in-depth exploration. Mixed methods research combines both quantitative and qualitative approaches, offering a more comprehensive understanding of a phenomenon.

Once we have chosen our paradigm and approach, it's time to craft a detailed research design. This blueprint outlines our data collection and analysis strategies. Key aspects of the design include clearly defining our research questions or hypotheses, the driving forces behind our inquiry. We then need to determine a sampling strategy- how will we select participants or data sources? Random sampling, stratified sampling, or purposive sampling are some key techniques to ensure representativeness. Next comes choosing data collection techniques, methods best suited to gathering the data we need. Interviews, surveys, observations, and document analysis are common tools. Finally, depending on our data type, we select data analysis techniques, which might include descriptive statistics, inferential statistics, thematic analysis, or discourse analysis.

Rigorous research demands strategies to ensure the quality of our data and findings. Here, validity- does our research accurately measure what it intends to measure?- and reliability- can our research be replicated by another researcher using the same methods?- become crucial considerations. Techniques like triangulation (using multiple data sources) can enhance validity, while pilot studies and pre-testing of instruments can improve reliability. Additionally, conducting research ethically is paramount. This involves informed consent, participant confidentiality, and responsible data handling.

Methodology is the backbone of a strong research project. By carefully considering paradigms, approaches, and design elements, we ensure our research is well-grounded and yields valuable insights. Remember, our methodology adapts and evolves throughout the research process. We must remain flexible, refine our approach as needed, and ultimately, let our methodology pave the way for a successful and impactful research journey.

Our exploration of project management (PM) integration within university strategic management (USM) demands a robust methodological framework to unearth its intricacies and potential. This section charts the proposed research path, employing a multifaceted approach that meticulously combines quantitative and qualitative methods to navigate the complexities of this dynamic topic.

This dissertation work, delving into the transformative potential of integrating project management tools within university strategic management, demands a robust and multifaceted methodology. The proposed approach encompasses three distinct phases: development, implementation, and evaluation, each employing rigorous methods to ensure insightful findings and practical recommendations.

1. *Development Phase*

A crucial first step involves engaging in collaborative workshops and consultations with key university stakeholders. Administrators, faculty, staff, and students, each representing unique perspectives and needs, will be invited to participate in facilitated discussions. These sessions will utilize methodologies like brainstorming, focus groups, and open-ended questionnaires to identify and prioritize strategic goals, map critical challenges, and gauge existing understanding of project management concepts (Creswell, 2014; Bryman, 2016).

Beyond stakeholder insights, a comprehensive analysis of existing university data will be conducted. Budget allocation records, project performance metrics, and student satisfaction surveys offer valuable quantitative data sets. Employing appropriate statistical tools and regression analysis, researchers will unravel patterns and correlations, illuminating areas where strategic planning and implementation diverge, and highlighting potential leverage points for project management integration (Bryman & Bell, 2007).

This dual approach, combining rich qualitative stakeholder perspectives with objective quantitative data, ensures a grounded and holistic understanding of the university's current state and strategic aspirations. In tandem, researchers will delve into existing literature on project management methodologies (Highsmith, 2009; Royce, 1970) and university strategic management models (Kaplan & Norton, 1996; Caldwell & Baldwin, 2008). This comprehensive review will inform

the design and adaptation of project management tools and frameworks specifically tailored to the unique nuances of the university context.

2. Implementation Phase

Having established a robust foundation, the research will transition to the implementation phase, where the developed model will be piloted in selected university departments or initiatives. Collaboration with department heads and faculty will be crucial in this stage, ensuring seamless integration of the model into existing workflows and structures.

Rigorous data collection methodologies will be employed to monitor the pilot's effectiveness. Pre- and post-implementation surveys, alongside semi-structured interviews with stakeholders directly involved, will capture perceptions, experiences, and potential challenges encountered during the integration process (Patton, 2002). Additionally, quantitative data, such as project performance metrics and resource utilization, will be tracked and analyzed to assess the model's impact on operational efficiency and goal achievement.

3. Evaluation Phase

The final phase focuses on thorough evaluation, allowing for iterative refinement and dissemination of the developed model. Data collected during the implementation phase will be meticulously analyzed, drawing upon qualitative and quantitative methods to uncover strengths, weaknesses, and areas for improvement. Stakeholder feedback will be actively sought through focus groups and feedback sessions, ensuring the model remains responsive to user needs and adapts to the evolving university landscape.

This rigorous evaluation process, informed by ongoing stakeholder engagement, facilitates continuous refinement of the project management integration model. The resulting evidence-based findings and best practices will be disseminated through academic publications, conference presentations, and university workshops, aiming to inspire broader adoption and contribute to the advancement of strategic management within higher education.

A stored theoretical foundation will be established, drawing upon relevant literature encompassing strategic management theories (Kaplan & Norton, 1996; Ackoff, 1989), PM methodologies (Highsmith, 2009; Royce, 1970), and organizational change theories. This framework will guide data interpretation and analysis, ensuring research grounded in established knowledge.

Embracing a mixed-methods approach, we will leverage both quantitative and qualitative data collection and analysis to gain a comprehensive understanding of the phenomenon.

Overview of planned methods for data collection

This research delves into the potential for integrating project management tools into university strategic management. To achieve a comprehensive understanding of stakeholder perspectives, a multi-methodological approach was employed, utilizing three key data collection techniques: in-depth interviews, online surveys, and focus groups.

Quantitative Methods

1. Online Surveys

   Surveys provide a cost-effective and efficient way to gather data from a large number of participants. They also allow for standardization of questions and ease of data analysis. The online survey captured broader trends and opinions across the university community regarding strategic management and project management integration. Administering validated instruments and utilizing appropriate sampling techniques, surveys will capture perceptions, attitudes, and experiences regarding PM integration from faculty, staff, and students. This allows for quantifiable data collection and generalizable insights (D'Onofrio et al., 2014).

2. Secondary Data Analysis

   Existing university datasets, such as budget allocation records, project performance metrics, and student satisfaction surveys, offer valuable quantitative data. Employing statistical tools and regression analysis will help identify correlations and potential causal relationships between PM implementation and outcomes.

Statistical software will be utilized to analyze survey data and secondary datasets, including tests of significance, identifying correlations, and generating descriptive statistics. Quantitative findings will be triangulated with qualitative data for increased validity.

Qualitative Methods

1. Case Studies

   In-depth case studies of universities successfully implementing PM in universities can provide rich contextual data and nuanced understanding of both challenges and successes. Utilizing semi-structured interviews, document analysis, and participant observation allows researchers to capture complex dynamics and lived experiences (Park et al., 2017).

2. Focus Groups

   Focus groups allow for a collaborative environment where participants can build on each other's ideas, leading to a deeper understanding of complex issues. Focus groups enabled a more in-depth exploration of specific themes identified through the initial data collection phases, particularly regarding practical considerations, potential challenges, and solutions for successful project management tool integration. Facilitating focus group discussions with stakeholders directly involved in PM integration (faculty, staff, administrators, students) can offer valuable insights into specific areas of interest, such as communication challenges, resource allocation concerns, or perceived benefits of PM adoption. Transcribing and analyzing discussions will reveal key themes and patterns.

3. In-Depth Interviews

   This method allows for rich, detailed data collection and exploration of nuanced perspectives. The interviewer can probe for clarification, follow up on interesting points, and tailor questions to individual experiences. In-depth interviews were particularly valuable for uncovering the rationale behind stakeholder opinions on current strategic management practices and their perceptions of project management integration.

By employing a multi-methodological approach, this research benefitted from the strengths of each data collection method. In-depth interviews provided rich, detailed data on stakeholder perspectives, while online surveys captured broader trends and opinions across the university community. Focus groups then enabled a deeper exploration of specific themes identified through the initial data collection phases. Together, these methods aim to provide a comprehensive and nuanced understanding of current university strategic management practices, stakeholder perceptions, and the potential for successful project management tool integration.

Sampling

This research investigates the potential for integrating project management tools into university strategic management practices. To gain a comprehensive understanding of stakeholder perspectives, a multi-methodological approach will be employed, utilizing three key data collection techniques: in-depth interviews, online surveys, and focus groups. Each technique necessitates specific sampling strategies to ensure the collected data accurately reflects the broader university population and offers meaningful insights.

1. In-Depth Interviews: Purposive Sampling for Nuanced Perspectives

Semi-structured interviews will be conducted with 25 key university stakeholders categorized into four groups:

University Leaders (n=5): Deans, provosts, and vice presidents with oversight over strategic planning and project management initiatives.

Project Management Experts (n=5): Individuals with experience managing university-level projects across various departments.

Faculty Representatives (n=10): Professors and instructors from diverse departments representing a range of disciplines and potential strategic initiatives.

Student Voices (n=5): Student government leaders and representatives involved in strategic planning committees.

Purposive sampling will be utilized to identify and recruit participants with specific knowledge, experience, or perspectives relevant to the research question.

University leaders will be chosen based on their oversight roles in strategic planning and project management.

Project management experts will be identified through their experience managing university projects of varying size and scope.

Faculty representatives will be selected from diverse departments to ensure a range of academic disciplines and potential strategic initiatives are represented. Their involvement in strategic planning committees or significant project experience is a plus.

Student voices will be recruited from student government leadership and strategic planning committees to capture the student perspective on current practices and potential project management integration.

Purposive sampling allows for the targeted recruitment of participants who possess specific knowledge and experience relevant to the research topic. This ensures the collected data offers rich insights into the diverse perspectives of key stakeholders involved in university strategic management and project management. In-depth interviews are particularly valuable for uncovering the rationale behind stakeholder opinions and experiences.

2. Unveiling Broader Perspectives: Stratified Random Sampling for a Representative Survey

A self-administered online survey will be distributed to a broader university population (n=300) encompassing faculty, staff, and students. This captures a wider range of perspectives and gauges overall awareness and engagement surrounding strategic management.

Stratified random sampling will be utilized to ensure a representative sample across university departments and roles. Subgroups will be formed based on department for faculty and staff, and administrative unit for staff (e.g., Admissions, Research). Students will be randomly selected from the overall student population.

Stratification will be based on academic colleges or departments within the university. A random sample of faculty members will be drawn from each department, proportional to their size within the college/department.

Staff: Stratification will be based on administrative units within the university (e.g., Admissions, Research, Facilities). A random sample of staff members will be drawn from each unit, proportional to their overall size.

A random sample of students will be drawn from the university's student population management system, ensuring representation across all academic years and departments.

Stratified random sampling allows researchers to draw a representative sample from a population with known subgroups. This ensures the survey results accurately reflect the perspectives of faculty, staff, and students across various departments and roles within the university. Obtaining a representative sample is crucial for generalizability of findings and understanding the overall level of awareness and engagement with university strategic management practices.

3. Focus Groups: Convenience Sampling for Collaborative Exploration

Three moderated focus groups will be conducted, each consisting of 6-8 participants with specific expertise:

Members will have prior experience in project management or strategic planning committees.

Project Management Focus Group: Participants will possess expertise in managing different types of university projects.

Representatives will be involved in strategic planning committees or student government leadership positions.

Convenience sampling will be utilized due to the specific needs of the focus groups. Participants with prior experience in project management or strategic planning, as applicable to each group, will be recruited from existing university committees or project teams.

Convenience sampling is suitable for situations where access to a specific population segment is limited or targeted expertise is required. In this case, we need participants with specific knowledge of project management or strategic planning within the university context. While convenience sampling may not ensure a statistically representative sample, focus groups are not intended to generalize to a larger population. Their strength lies in generating rich, collaborative discussions that explore specific themes.

Overview of planned methods for data analysis

This research delves into the potential for integrating project management tools into university strategic management. To achieve a comprehensive understanding of stakeholder perspectives, a multi-methodological approach will be employed, utilizing three key data collection techniques: in-depth interviews, online surveys, and focus groups. Each technique presents a unique set of data requiring specific analysis methods to extract the most valuable insights.

1. Decoding the Narratives: Thematic Analysis of In-Depth Interviews

The rich, detailed data collected through in-depth interviews necessitates a qualitative analysis approach. Thematic analysis, a flexible and widely used method, will be employed to identify, analyze, and interpret recurring themes within the interview transcripts.

Process:

1. Each interview transcript will be carefully reviewed and coded line-by-line for initial themes. This may involve open coding, where a broad range of initial codes are assigned to capture all aspects of the data.
2. The initial codes will be reviewed and grouped into broader, more focused themes. This process may involve axial coding, where relationships between codes are explored to develop a more nuanced understanding of the themes.
3. Each theme will be clearly defined and named, ensuring it captures the essence of the coded data associated with it.
4. The identified themes will be presented in the research findings, along with supporting quotes from interview transcripts. This stage involves interpreting the meaning of the themes in relation to the research question and existing literature on project management integration in universities.

While thematic analysis can be conducted manually, qualitative data analysis software such as NVivo or Atlas.ti can be valuable for managing and organizing large amounts of data, facilitating the coding and thematic development process.

This method allows for the in-depth exploration of stakeholder experiences and perspectives. By identifying recurring themes, we can gain valuable insights into the strengths and weaknesses of the current strategic management approach, stakeholder perceptions of project management principles, and their anticipated benefits and challenges of integration.

2. Unmasking Trends: Quantitative Analysis of Online Survey Data

The online survey data, designed to capture broader opinions and perspectives across the university community, will be analyzed using quantitative methods. Descriptive statistics and inferential statistics will be utilized to understand the central tendencies, variability, and potential relationships within the data.

Descriptive Statistics:

1. Measures of central tendency (mean, median) will describe the overall level of awareness and engagement with university strategic management practices.
2. Measures of variability (standard deviation, range) will reveal the spread of opinions and identify potential outliers.
3. Frequency tables and percentages will illustrate the distribution of responses across answer choices for various survey questions.

Depending on the nature of the data (e.g., nominal, ordinal), appropriate statistical tests will be employed to explore potential relationships between variables. For example:

- ✓ Chi-square tests could assess if there is a significant association between department affiliation and attitudes towards project management integration.
- ✓ T-tests could analyze if there are statistically significant differences in perceptions of communication and collaboration between faculty and staff.

Statistical software like SPSS or R will be utilized for efficient data cleaning, analysis, and visualization. These tools allow for the generation of tables, graphs (e.g., bar charts, histograms), and statistical summaries that effectively communicate the findings.

This approach allows researchers to generalize findings to the broader university population and identify potential trends in opinions and attitudes. By analyzing relationships between variables, we can gain deeper insights into how different stakeholder groups perceive strategic management and project management integration.

3. Collaborative Exploration: Analyzing Focus Group Discussions

Focus group discussions, fostering rich collaborative dialogue between participants, require a specific analysis approach. Here, a thematic analysis framework similar to the one used for interviews will be employed. However, additional considerations will be taken into account.

Process:

1. The audio recordings of focus group discussions will be transcribed verbatim.
2. Transcripts will be reviewed and coded for themes, considering not only the content of the discussion but also participant interactions and nonverbal cues (e.g., laughter, hesitation).
3. Coded data will be analyzed to identify key themes reflecting shared concerns, potential solutions, and practical considerations regarding project management integration.

This approach allows for a deeper exploration of the themes identified through the initial data collection phases (interviews and surveys). By analyzing group discussions, we can uncover the nuances and dynamics of stakeholder perspectives, particularly around practical considerations, potential challenges, and solutions for successful implementation.

The strength of this research lies in the multi-methodological approach and the subsequent triangulation of findings. Triangulation involves using multiple data collection and analysis methods to corroborate, complement, and enrich the understanding of a research question.

In this study, the thematic analysis of interviews will provide in-depth insights into stakeholder experiences and perspectives. The quantitative analysis of survey data will offer a broader understanding of trends and potential relationships within the university community. The analysis of focus group discussions will delve deeper into specific themes, revealing the dynamics of stakeholder interaction and potential solutions.

By triangulating the findings from these diverse data sources, a more comprehensive and nuanced understanding of stakeholder perspectives on project management integration in universities can be achieved. This comprehensive picture will not only reveal areas of consensus and divergence, but also identify potential areas for further investigation.

DATA ANALYSIS

Informed by a comprehensive literature review, the following SWOT analysis dissects the potential of a project management-based model for university strategic management. This SWOT analysis examines the potential strengths, weaknesses, opportunities, and threats associated with implementing a model of strategic management in universities based on project management tools.

Strengths

1. *Improved Planning and Execution*. Project management tools provide a structured framework for clearly defining project goals, timelines, resources, and communication plans. This can lead to more efficient and effective planning and execution of strategic initiatives within universities.
2. *Enhanced Communication and Collaboration*. Project management tools often incorporate collaboration features, facilitating communication and information sharing between stakeholders involved in strategic initiatives.
3. *Increased Transparency and Accountability*. Project management tools typically offer real-time progress tracking and reporting capabilities. This enhances transparency and accountability within strategic initiatives, allowing for course corrections and resource adjustments as needed.
4. *Improved Resource Allocation.* Project management frameworks promote a resource-based approach, ensuring that the necessary resources (e.g., personnel, budget, technology) are allocated effectively across various strategic initiatives.
5. *Data-Driven Decision Making*. Project management tools can generate valuable data on project performance. This data can be used to inform future decision making within university strategic planning.

Weaknesses

1. *Resistance to Change.* The university culture may be resistant to adopting new management tools and processes. Faculty and staff accustomed to existing strategic planning approaches may require training and support to adapt.
2. *Bureaucracy and Over-complexity*. Implementing project management tools can introduce additional administrative tasks and processes. It's crucial to find a balance between structure and flexibility, ensuring the model doesn't become overly bureaucratic.
3. *Limited Expertise.* Universities may lack the in-house expertise to effectively manage complex projects and utilize project management tools. Training and capacity building initiatives may be necessary.
4. *Potential for Increased Costs.* Implementing project management tools may incur initial costs for software licenses, training, and potential changes to existing IT infrastructure.
5. *Focus on Short-Term Goals*. Project management often emphasizes short-term project goals. It's essential to integrate this project focus with the university's long-term strategic vision and mission.

Opportunities

1. *Enhanced Competitiveness.* Efficient and effective strategic management can give universities a competitive edge in a dynamic higher education landscape.

2. *Increased Collaboration and Innovation.* Project management tools can facilitate collaboration across departments and disciplines, fostering innovation and cross-functional initiatives within the university.
3. *Improved Stakeholder Engagement.* Project management frameworks can provide a structured approach to stakeholder communication and engagement, potentially leading to greater buy-in and support for strategic initiatives.
4. *Alignment with Funding Priorities.* Universities increasingly seek external funding for strategic initiatives. Project management practices can demonstrate a structured approach to managing projects, potentially improving grant applications and attracting funding.
5. *Leveraging Technology.* Project management software and tools are constantly evolving. Universities can leverage advancements in technology to further enhance project management capabilities.

Threats

1. *Lack of Leadership Support*. Successful implementation requires strong leadership support for adopting new project management practices within the university. Lack of buy-in from key leaders can hinder the effectiveness of the model.
2. *Incompatibility with University Culture.* Rigid project management methodologies may not align well with the unique and potentially more flexible culture of universities. It's essential to adapt the model to fit the specific context.
3. *Data Overload and Information Fatigue.* Project management tools can generate significant data. Universities need strategies to avoid information overload and ensure stakeholders focus on the most critical data points.
4. *External Pressures.* External pressures, such as budget cuts or policy changes, can derail project implementation or require adjustments to the model.
5. *Project Management Tool Failure.* Technological glitches or user adoption issues with the selected project management tool can disrupt the effectiveness of the model.

EXPECTATIONS

This dissertation delves into the potential for integrating project management tools and principles into the strategic management practices of universities. As we embark on this research journey, it's crucial to establish clear expectations for both the researcher (myself) and the reader.

1. *Expectations for the Researcher:*

A well-defined research methodology is paramount. This includes employing a multi-methodological approach, utilizing appropriate data collection techniques like in-depth interviews, online surveys, and focus groups. Additionally, ensuring robust sampling strategies and employing rigorous data analysis methods like thematic analysis, quantitative analysis, and focus group discussion analysis is crucial.

The research will involve critically analyzing the collected data, identifying key themes and trends, and drawing meaningful conclusions based on the evidence. The researcher must effectively interpret stakeholder perspectives, assess potential benefits and challenges of project management integration, and situate the findings within the existing body of knowledge on university strategic management and project management practices.

The research process and findings must be presented with transparency and methodological rigor. This includes clearly outlining the research methods, data analysis processes, and limitations of the study. Additionally, ensuring proper data management, ethical considerations, and academic integrity throughout the research process is essential.

This dissertation aims to contribute meaningfully to the existing body of knowledge on project management integration in universities. This involves critically reviewing existing literature, identifying research gaps, and presenting novel findings or insights that can inform future practice and research directions.

2. *Deliverables for the Reader:*

The research aims to provide a comprehensive understanding of how key stakeholder groups within universities perceive project management principles, potential benefits of integration, and anticipated challenges. This will be achieved by presenting the analysis of data collected from university leaders, project management experts, faculty representatives, and students.

The research will critically assess the potential for successfully integrating project management tools and practices within the unique cultural and structural context of universities. This involves identifying potential benefits like improved communication, collaboration, efficiency, and resource allocation, while acknowledging potential challenges and proposing strategies for successful implementation.

Building upon the research findings, this dissertation will offer evidence-based recommendations for universities considering project management integration. This may include tailored project management frameworks for higher education, capacity building strategies for faculty and staff, and considerations for change management within universities. Additionally, the research will identify future research directions to further explore the implications of project management integration within the evolving landscape of university strategic management.

By establishing these clear expectations, we ensure a focused and impactful research journey. This dissertation strives to offer valuable insights that can inform universities as they navigate the dynamic environment of higher education and seek to achieve their strategic goals in a more efficient and effective manner.

CONCLUSION

This dissertation has explored the potential for integrating project management tools into university strategic management practices. By employing a multi-methodological approach, the research delved into the perspectives of key stakeholders, including university leaders, project management experts, faculty representatives, and students. The findings offer valuable insights into the current state of university strategic management, stakeholder perceptions of project management principles, and the anticipated benefits and challenges associated with integration.

Key Findings

1. The research identified a general awareness of project management principles amongst stakeholders, but limited understanding of their potential application within university strategic management.
2. Stakeholders expressed a desire for improved communication, collaboration, and resource allocation in current strategic planning processes.
3. Project management was perceived as potentially beneficial for enhancing clarity, accountability, and efficiency in achieving strategic goals.
4. Concerns regarding the potential for increased bureaucracy and a lack of adaptability within the unique university culture were also highlighted.

Implications and Future Directions

The findings suggest that project management integration within universities holds promise for achieving strategic goals in a more efficient and effective manner. However, successful integration requires careful consideration of stakeholder perspectives and the unique cultural and structural context of universities.

Future research could explore:

1. Developing tailored project management frameworks specifically designed for the higher education sector.
2. Investigating strategies for capacity building and training to equip faculty and staff with the necessary project management skills.

3. Examining the impact of project management integration on specific types of strategic initiatives within universities.

Concluding Remarks

This research provides a springboard for further exploration and dialogue on the potential of project management integration in universities. By embracing innovative approaches and fostering collaborative stakeholder engagement, universities can empower themselves to achieve their strategic goals, navigate a dynamic environment, and ultimately fulfill their core mission of education, research, and service.

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TEACHING ENGLISH IN AZERBAIJAN: CHALLENGES AND OPPORTUNITIES

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ABSTRACT

This paper explores the multifaceted challenges faced by English language teachers in Azerbaijan. Despite the country's increasing global integration and the growing importance of English, several obstacles hinder effective language acquisition and teaching. Teaching English as a Foreign Language (EFL) in Azerbaijan presents a unique challenge that can affect teachers and students. Here are some common problems encountered in EFL classrooms: Key challenges include **Limited Exposure to English:** Many students have limited exposure to English outside the classroom, hindering language development. **Teacher Training and Qualifications:** A shortage of qualified English teachers and inadequate teacher training programs can affect the quality of instruction. **Lack of Authentic Materials:** The scarcity of authentic materials, such as English-language books, magazines, and movies, limits students' exposure to real-world English. **Large Class Sizes:** Overcrowded classrooms can make it difficult for teachers to provide individual attention and personalized instruction.

***Keywords**: Various Skills, Proficiency, Different Levels, Strategies, Resources*

1. INTRODUCTION

Azerbaijan, a country nestled at the crossroads of Europe and Asia, has witnessed a surge in English language education over the past few decades. As globalization continues to shape the world, English has emerged as a lingua franca, making it essential for Azerbaijanis to acquire proficiency in this language.

While there is a growing body of research on teaching English in Azerbaijan, more research is needed to address the specific challenges faced by teachers and students. By understanding these challenges, researchers can contribute to the development of effective solutions and improve the quality of English language education in Azerbaijan (Murshudova, 2012). The capacity of the learners plays an important role; it is determined by the learners' intelligence and the amount of effort they put forth in taking steps to overcome the obstacles (Mohammed, 2018). Marcellino (2008) also has reported the challenges in teaching English. Students' language proficiency is affected by their cultures and bad language environments. In terms of the teachers' challenges in teaching English, preparation and performance are the main problems for the teachers in teaching English. Lastly, Zaim (2017) has identified the teachers' ability to implement the steps of the scientific approach in teaching English.

This issue is prevalent in all Azerbaijan schools, where students are taught how to have conversations but are given written tests in English for exams. The fact that students need to learn how to communicate in English rather than take a written test makes this issue crucial for all involved.

Because they will need to be able to communicate with others and speak in public once they graduate. "Learning the speaking skill is the most important aspect of learning a second or foreign language and success is measured based on the ability to perform a conversation in the

language," according to Nunan (1995), as stated in Leong & Ahmadi (2017). This demonstrated that assessing speaking abilities is more crucial than taking a written test.

2. COMMON PROBLEMS OF TEACHING ENGLISH IN AZERBAIJAN

1. Language Proficiency:

a) Student Variation: Students often have varying levels of English proficiency within the same class, making it difficult to cater to all needs.

b) Limited Exposure: Students may have limited exposure to English outside the classroom, hindering language acquisition.

Language proficiency refers to an individual's ability to use a language effectively for communication. It encompasses various skills, including:

- Reading: Understanding written text, from simple words to complex articles.
- Writing: Expressing thoughts and ideas clearly and accurately in written form.
- Listening: Comprehending spoken language is a casual conversation or a formal presentation.
- Speaking: Communicating thoughts and ideas fluently and coherently.

Language proficiency is often measured on a scale, with different levels indicating varying degrees of ability. One commonly used framework is the Common European Framework of Reference for Languages (CEFR). This framework divides language proficiency into six levels:

A1: Beginner: Basic understanding and use of everyday expressions.

A2: Elementary: Can communicate in simple situations, and understand basic instructions.

B1: Intermediate: Understand the main points of clear standard input on familiar matters.

B2: Upper-Intermediate: Can understand the main ideas of complex texts on both concrete and abstract topics.

C1: Advanced: Can understand a wide range of demanding, longer texts, and recognize implicit meaning.

C2: Proficiency: Can understand with ease virtually everything heard or read.

It is important to note that language proficiency is a complex skill that involves not only grammar and vocabulary but also cultural understanding, pronunciation, and the ability to adapt to different contexts.

2. Cultural Differences:

- Misunderstandings: Cultural differences can lead to misunderstandings and misinterpretations of language and communication styles.
- Sensitivity: Teachers must be sensitive to cultural nuances and avoid stereotyping or making assumptions.

3. Limited Resources:

- Material Scarcity: Many EFL classrooms, especially in developing countries, lack sufficient textbooks, teaching aids, and technology.
- Infrastructure: Inadequate infrastructure, such as classrooms and learning facilities, can further hinder the learning process.

Limited resources in EFL classrooms can be a significant challenge, but it doesn't have to hinder effective teaching. Here are some strategies to overcome this issue:

1. Leverage the Environment

- Real-world objects: Use objects in the classroom or nearby environment to teach vocabulary and grammar.
- Outdoor learning: Take your class outside to practice dialogues or describe the surroundings.

- **Community resources:** Visit local shops, markets, or cultural sites to immerse students in language use.

2. Utilize Technology

- **Mobile devices:** Use smartphones or tablets for language learning apps, online dictionaries, and video lessons.
- **Free online resources:** Explore websites like YouTube, TED Talks, and language exchange platforms for authentic materials.
- **Create your resources:** Use simple tools like PowerPoint or Canva to design engaging visuals and quizzes.

3. Innovative Teaching Methods

- **Games and activities:** Create simple games using cards, dice, or chalk to practice vocabulary, grammar, and pronunciation.
- **Role-plays and simulations:** Encourage students to act out real-life scenarios to improve speaking skills.
- **Peer teaching:** Pair up students to teach each other, promoting collaboration and language use.

Here are some innovative teaching methods to engage your EFL students:

Active Learning Strategies:

- **Role-Playing:** Assign roles and scenarios to practice real-life conversations.
- **Simulations:** Create realistic situations to practice language skills in a controlled environment.
- **Debates and Discussions:** Encourage critical thinking and language use through debates on relevant topics.
- **Project-Based Learning:** Assign projects that require students to research, analyze, and present information.

Gamification:

- **Board Games:** Create custom board games to practice vocabulary, grammar, and pronunciation.
- **Scavenger Hunts:** Organize language-based scavenger hunts around the classroom or school.
- **Point Systems:** Reward students with points for correct answers, participation, and effort.
- **Badges and Certificates:** Recognize student achievements with digital badges and certificates.

Authentic Materials:

- **News Articles:** Use current news articles to discuss relevant topics and practice reading comprehension.
- **Movie Clips:** Show short movie clips to practice listening comprehension and vocabulary.
- **Music Videos:** Use music videos to teach vocabulary, grammar, and cultural understanding.
- **Podcasts:** Listen to podcasts to improve listening skills and learn about different accents.

Collaborative Learning:

- **Group Work:** Divide students into groups to work on projects, presentations, or discussions.
- **Peer Teaching:** Encourage students to teach each other, reinforcing their own learning.
- **Language Exchange Partners:** Connect students with native speakers for language practice and cultural exchange.

By incorporating these innovative teaching methods into your EFL classroom, you can create a more engaging, effective, and enjoyable learning experience for your students.

4. Community Engagement

- **Language exchange partners:** Connect students with native speakers for language practice and cultural exchange.
- **Volunteer opportunities:** Encourage students to volunteer in local organizations to practice English in real-world settings.
- **Community events:** Organize language exchange events or cultural festivals to create a language-rich environment.

5. Teacher Creativity and Resourcefulness

- **DIY materials:** Create your flashcards, worksheets, and games using recycled materials.
- **Collaborative planning:** Work with other teachers to share resources and ideas.
- **Professional development:** Attend workshops, conferences, or online courses to learn new teaching techniques.

Additional Tips:

- **Focus on communicative competence:** Prioritize activities that encourage students to use language for real-world purposes.
- **Encourage student autonomy:** Empower students to take ownership of their learning by setting personal goals and seeking out resources.
- **Positive reinforcement:** Celebrate student achievements, no matter how small, to boost motivation and confidence.
- **Adapt to the context:** Be flexible and adjust your teaching methods to suit the specific needs and resources of your students.

By embracing these strategies, you can create engaging and effective EFL lessons even with limited resources.

4. Student Motivation:

- **Lack of Interest:** Students may lack intrinsic motivation to learn English, particularly if they do not see immediate practical applications.
- **Fear of Failure:** Fear of making mistakes can discourage students from actively participating in class activities.

5. Teacher Training and Development:

- **Insufficient Training:** Many EFL teachers may lack adequate training in effective teaching methodologies and language skills.
- **Professional Development:** Opportunities for ongoing professional development may be limited, hindering teacher growth.

Strategies to Address EFL Challenges

1. Differentiated Instruction:

- Tailor lessons to meet the diverse needs of students by providing a variety of activities and resources.
- Use various teaching techniques, such as group work, individual projects, and multimedia resources.

2. Cultural Sensitivity:

- Create a culturally inclusive classroom environment where students feel valued and respected.
- Use authentic materials that reflect different cultures and perspectives.

3. Creative Resourcefulness:

- Develop low-cost or no-cost teaching materials, such as flashcards, games, and worksheets.
- Utilize technology effectively to enhance learning experiences.

4. Engaging Activities:
- Incorporate interactive and fun activities, such as role-plays, simulations, and debates, to motivate students.
- Use real-world contexts to make learning relevant and meaningful.

5. Continuous Professional Development:
- Seek opportunities for professional development, such as workshops, conferences, and online courses.
- Collaborate with other teachers to share ideas and best practices.

By addressing these common challenges and implementing effective strategies, EFL teachers can create engaging and effective learning environments that empower students to achieve their language goals.

3. CONCLUSION

In conclusion, teaching English in Azerbaijan presents a complex interplay of challenges and opportunities. While the country has made significant strides in English language education, there is still much work to be done to improve the quality of teaching and learning. According to the discussion above, the teacher's involvement in handling the issues that arise when teaching English is crucial to the effectiveness of the learning process. Since this will be the key to students' successful learning, the teacher must also pay attention to the difficulties that the pupils are having studying English. To address the challenges and ensure the future success of English language education in Azerbaijan, it is essential to:

- Invest in Teacher Training: Prioritize the professional development of English teachers to equip them with the necessary skills and knowledge.
- Promote Authentic Materials: Encourage the use of authentic materials to provide real-world language exposure.
- Leverage Technology: Utilize technology to enhance language learning and create engaging learning environments.
- Foster Collaborative Learning: Implement collaborative learning activities to promote student engagement and interaction.
- Support Research and Innovation: Encourage research on effective teaching methodologies, curriculum development, and assessment practices.

By implementing these strategies, Azerbaijan can further strengthen its position as a global player and equip its citizens with the linguistic skills needed to succeed in the 21st century.

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Methodological foundations of the formation of media culture of university students

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ЖОО-ны студенттерінің медиамәдениетін қалыптастырудың әдістемелік негіздері

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Annotation

The article reveals the essence and content of the concept of media culture, analyzes the importance of forming the media culture of future teachers. The characteristics of active and interactive teaching methods are given, which help to effectively form the media culture of students in a university setting.
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Аннотация

Мақалада медиамәдениет түсінігінің мәні мен мазмұны айқындалып, болашақ педагогтардың медиамәдениетін қалыптастырудың маңыздылығы талданады. Жоғары оқу орны жағдайында студенттердің медиамәдениетін қалыптастыруды тиімді жүзеге асыруға көмектесетін оқытудың белсенді және интерактивті әдістеріне сипаттама беріледі.
Мақала AP19679344 «ЖОО-да оқытушылар мен студенттердің желілік коммуникативтік мәдениеті мен цифрлық этикетін қалыптастырудың ғылыми-әдістемелік негіздерін зерттеу» тақырыбындағы Қазақстан Республикасы Ғылым және жоғары білім министрлігі Ғылым комитетінің гранттық жобасы аясында жарияланды.

Keywords: Media, media culture, media education, media culture of the future teacher, lectures, debates, trainings, business and role-playing games.
Кілт сөздер: Медиа, медиамәдениет, медиабілім, болашақ педагогтың медиамәдениеті, дәріс, пікірталас, тренингтер, іскерлік және рөлдік ойындар.

Қазіргі отандық жоғары білім берудің бәсекелік деңгейі – студенттердің инновацияларды игеруі, қарқынды даму үстіндегі әлемдік сұраныстар мен талаптарға жылдам бейімделуі арқылы анықталады. Дамыған мемлекеттердің тәжірибесіне сүйену, олардың ең озық жетістіктерін бойға сіңіру және медиақұралдар арқылы таралатын ақпараттарды саналы тұрғыдан қабылдау болашақ маманның медиалық сауаттылығы пен мәдениеттілігін талап етеді.

Медиамәдениет – адамзат тарапынан мәдени-тарихи даму барысында қалыптасатын ақпараттық-коммуникативтік құралдардың, материалдық және интеллектуалдық құндылықтардың жиынтығы. Медиамәдениет – болашақ педагогтың ақпараттық қоғамдағы мінез-құлық ережелерінің жиынтығы, ақыл-ой жүйесімен байланысты қарым-қатынас жасаудың нормасы мен тәсілдері, телематика, жаһандық және локальды ақпараттық жүйе құралдарын қолдану тәсілі. Медиамәдениеттің жоғары деңгейде дамуы кәсіби маманның медиакеңістіктегі мансаптық өсуі мен жан-жақты дамуына мүмкіндіктер береді. Медиамәдениет пен медиашығармашылық жеке тұлғаның әлеуметтенуі және кәсіби қалыптасуымен тығыз өзара байланыста дамиды.

А.В. Федоров тұлғаның медиамәдениетін оның тікелей медиамәтіндерді талдау біліктілігі арқылы көруге болады деп есептейді. Ақпаратпен жұмыс барысында, ең алдымен, медианың құрылымына, дереккөзіне, агенттігіне мән беру қажет, яғни ақпаратты кімнің хабарлап тұрғанын білу маңызды. Екінші, медиамәтіннің мазмұнын талдауға мән беру қажет, яғни ақпараттың негізгі құндылық пен идеологиясы қандай, ақпаратты құрастырудағы негізгі мотиві, мақсаты пен ақпараттың тигізетін пайдасын және т.б. анықтауға тырысу керек. Үшінші маңызды мәселе аудиторияға қатысты, яғни кез-келген медиамәтін белгілі бір аудиторияға арналып құрылады. Оның мазмұнында сол аудиторияның жас ерекшелігі, психологиялық даму мүмкіндіктері ескерілуі мүмкін. Медиамәтіндерді талдағанда мәтіннің кімге арналғандығын және оны құрастыруда қандай форма, стиль, шарттар мен кодтар, әсер ету техникасы т.б. қолданылғанына мән беру маңызды [1].

C.Bazalgette еңбектерінде медиабілім мен медиамәдениеттің категориялары алтыға жіктеледі:

- ✓ Медиа агенттігі (ақпаратты таратушы кім және неліктен?);
- ✓ Медиа категориясы (бұл медиамәтіннің қандай түрі?);
- ✓ Медиа технологиясы (бұл медиамәтін қалай құрылған?);
- ✓ Медиа тілі (бұл медиамәтіннің не мағына білдіретіндігін біз қалай білеміз?);
- ✓ Медиа аудиториясы (бұл медиамәтінді кім қабылдайды және ол аудиторияға қалай әсер етеді?);
- ✓ Медиалық репрезентация (бұл медиамәтін тақырыпты қалай ашып көрсетеді?) [2].

Университеттің медиабілім беру кеңістігінің субъектісі медиамәдениетті тасымалдаушы болады. ЖОО-ның болашақ мамандары арасында медиа ресурстардың көмегімен ерекше қарым-қатынас стилі пайда болады. Университеттің медиабілім беру кеңістігінің құралдарына: білім берудің әртүрлі түрлерін беруге, сақтауға және өңдеуге, жылдам қол жеткізуді қамтамасыз етуге, білім беру коммуникацияларын жүзеге асыруға арналған бағдарламалық-техникалық құралдар жиынтығы кіреді [3].

Оқу іс-әрекетінде болашақ педагогтерге бұқаралық ақпарат құралдарымен өзара әрекеттесу мәдениетін меңгеру ерекше маңызды. Медиамәтіндермен және басқа ақпарат көздерімен жұмыс істеу кезінде олардың субъективтілік көрінісінің дұрыстығы мен тиімділігі олардың медиасауаттылық деңгейімен тығыз байланысты.

Болашақ маманның медиамәдениеті үнемі дамытуды, жетілдірілуі қажет етеді және бұл үздіксіз жүзеге асатын үдеріс. Жоғары оқу орны жағдайында болашақ педагогтардың медиамәдениетін қалыптастыру үшін оқытудың дәстүрлі әдістерімен қатар, инновациялық

әдістерінің де қолданылуы маңызды. Біз дәрісті дәстүрлі форматта емес, интерактивтік форматта өткізуді қолдаймыз: проблемалық дәріс, дәріс-конференция, дәріс-пікірталас, дәріс-кеңес беру, «сұрақтар-жауаптар-талқылау» дәрісі т.б. Сондай-ақ, семинар сабақтары да үй тапсырмасын тексерумен шектелмеуі тиіс. Оның орнына интерактивті семинар жұмыстарын: «мәселені анықтау» семинары, «мәселені шешу» семинары, «мәселелік шешімді қолдану» семинары және т.б. ұйымдастыруға болады.

Ал, студенттердің медиамәдениетке деген практикалық дайындығын қалыптастыруда нақты жағдайды талдау әдісі (кейс-стади), өз тәжірибесін және құзыреттілігін дайындау және қайта құру (жобалар әдісі) т.б. тиімді болады.

Зерттеу жұмыстары көрсеткендей, болашақ педагогтардың медиамәдениетін қалыптастыру үдерісінде оқытудың репродуктивті және белсенді әдістерін (тренингтер, пікірталас, рөлдік және іскерлік ойындар т.б.) пайдалану маңызды болып табылады. Оқытудың белсенді әдістері проблемалық мәселелерді, іскерлік және рөлдік ойындар, топтық пікірталас, миға шабуыл, әлеуметтік-психологиялық тренингтерді қамти отырып, студенттердің белсенді ізденушілік әрекеттерін іске қосады. Аталмыш әдістерді пайдалану арқылы студенттердің танымдық іс-әрекеттерін белсендендіру, шығармашылық жұмыстарын жандандыру, оқыту үдерісін шынайы кәсіби іс-әрекетке жақындата отырып жүргізу мүмкін болады.

ЖОО-ны студенттерінің медиамәдениетін қалыптастыруда пайдалануға болатын бірқатар оқыту әдістеріне тоқталып өтейік.

Оқытудың белсенді дәрістік әдістері. Дәріс көлемді теориялық материалды жеткізуге мүмкіндік береді және оның тұтастығын қамтамасыз етеді. Дәріс әлі күнге дейін оқытудың дәстүрлі, әрі жетекші әдісі, оны оқытудың басқа әдістерімен – семинар, практикалық сабақтар, студенттің өздік жұмысы т.б. сабақтастыра отырып, пайдалану жоғары оқу үдерісінің тиімділігін арттыра түседі.

Дәрісті құру кезінде оқытушы бірқатар талаптарды ескеруі қажет: баяндалатын мәтіннің нақты құрылымы мен логикасын білу; теориялық және әдістемелік жағынан сенімді ақпаратты беру және маңызды мәселені қамту; алдыңғы және кейінгі оқу материалы арасындағы тығыз байланыс пен бірізділікті сақтау; дәлелденген және дәйектелген болуы; мысалдар, деректер мен негіздерді қамтуы; теорияның практикамен байланысының болуы; қарама-қайшылықтарды айшықтау және оны шешу жолдарын көрсету, студенттерде сыни ойлауды ынталандыратын сұрақтарды туындату; студенттердің танымдық қызығушылығын арттыру, өзбетімен оқуға бағыт-бағдар беру; ғылымның дамуына сәйкес келуі, көрнекі болуы, мүмкіндік болса аудиовизуалды мәтіндердің болуы; нақты, әрі айқын тілмен жеткізілуі, қолданылған терминдерге түсініктеменің болуы; барлық аудиторияның қабылдауына қолжетімді болу т.б.

Дәрістің функцияларына: ақпараттық, танымдық, жүйеленген, түсіндіруші, дамытушы, ұйымдастырушылық, тәрбиелік т.б. жатады. Педагогика ғылымында дәрістің дәстүрлі және дәстүрлі емес формада өткізілетін жиырма бестен артық түрлері бар. Болашақ педагог-психологтарды кәсіптік даярлауда дәрістің дәстүрлі де, дәстүрлі емес те типтерін пайдалану жоғары нәтижелерге қол жеткізуге мүмкіндік береді.

Оқытудың белсенді дискуссиялық әдістері. Пікірталас – студенттердің сыни талдау дағдылары мен шығармашылық ойлауын дамытатын маңызды форма. Пікірталас барысында санадағы ойлар мен идеяларды анықтау, талқылау, негіздеу және талдау функциялары орындалады. Пікірталаста сыни ойлау дағдыларынан бөлек, ғылыми-зерттеушілік, ұйымдастырушылық, қарсыласты тыңдай білу және оның келтірген дәйектерін өзінікімен салыстыру сияқты дағдылар дамиды.

Проблемалық оқыту студенттердің танымдық жеке қалыптасуына, логикалық, рационалды, сыни және шығармашылық ойлауының, таным қабілеттерінің дамуына бағытталады.

Мәселелі оқытудың функциясына: студенттердің интеллектісін дамыту, танымдық және шығармашылық қабілеттерін арттыру; студенттердің білімдер жүйесін, танымдық қабілет және практикалық іс-әрекеттерді игеруін қамтамасыз ету; жан-жақты дамыған тұлғаны қалыптастыру т.б. жатады.

Оқытудың белсенді тренингтік әдістері. Тренинг білім, іскерлік және дағдыны дамытуға бағытталған оқытудың белсенді әдісі. Топта тренинг барысында шынайы өмірдегі сияқты өзара байланыс пен қарым-қатынас жүйесі моделденеді. Бұл өзінің және өзге адамдардың мінез-құлықтық және қарым-қатынастық психологиялық заңдылықтарының психологиялық қауіпсіз жағдайын көруге және талдай білуге мүмкіндік береді.

Әлеуметтік-психологиялық тренингтің келесі түрлерін бөлуге болады: сенситивті тренинг (мінез-құлықты жоспарлау); психологиялық-педагогикалық тренинг; психодинамикалық тренинг; трансактілі талдау топтары; психодрама; нейролингвистикалық бағдарламалау топтары; оқыту үдерісіндегі тренинг.

Тренинг әдістерінің мақсаты әртүрлі болуы мүмкін. Тренингтік топтың мазмұны мен бағытын біріктіре келе тренингтің келесі ортақ мақсаттарын бөліп қарастыруға болады: топтың қатысушыларының психологиялық мәселелерін зерттеу және оның шешіміне көмек көрсету; субъективті өзін-өзі сезінудің жақсаруы мен психикалық денсаулықтың нығаюы; адамдармен гормониялық және нәтижелі қарым-қатынасты құру үшін тұлғааралық қарым-қатынастың тәсілдері мен психологиялық заңдылықтардың механизмдерін зерттеу; ішкі және мінез-құлықтық өзгерістер негізінде қатысушылардың өзіндік санасы мен өзіндік ізденімпаздықтарын дамыту; тұлғалық даму үдерісіне бір-біріне жәрдемдесу, шығармашылық әлеуетін жетілдіру.

Оқытудың белсенді ойындық әдістері. Психологиядағы ойын әдістері үш топқа жіктеледі: іскерлік ойындар (дидактикалық, шығармашылық, басқарушылық); рөлдік ойындар (мінез-құлықтық, интонациялық-сөздік тренингтер, ойындық тренингтер); кері-ойын пікірлердің, позиция, қарым-қатынас стилдерінің қақтығысына негізделген (коммуникативті мінез-құлықты құрудың трансактілі әдісі).

Ойындар – бұл әлеуметтік тәжірибені тасымалдаудың таптырмас әдісі, ол практикалық міндеттерді шешу бойынша имитациялық іс-әрекеттерді құруға мүмкіндік береді. Студенттер ойын әдісінде «ойынға қатысушыдан» ойынның авторына айналуы мүмкін. Ойындар кезінде әлеуметтік тәртіп пен ережелер модельденеді, эмоционалды қысымды жеңілдетуге жағдай жасалады. Ойындардың келесі түрлерін бөлуге болады: әлеуметтік-экономикалық, өндірістік, әлеуметтік-мәдени, басқару, экономикалық, саяси т.б. Ойындарды өткізудің механизмдері: ойынның мәні түсіндіріледі; ойынды ойнаудың нақты нұсқауы беріледі; рөлдер бөлінеді; шешілуі тиіс мәселелер айтылады; жағдаят ұйымдастырылып, рөлдік ойындар жүзеге асады; соңында ойынның қорытындысы жасалады.

Жалпы айтқанда, оқытудың әдістері болашақ педагогтардың танымдық белсенділігін арттырып, кәсіби іс-әрекеттерге ынталандырады. Студенттің белсенді оқу әрекеті сынға ашықтығынан, өзін-өзі бағалау, өзін-өзі бақылау, жүйеге сәйкес өзінің жұмысын құра алу іскерліктерінен көрінеді. Болашақ педагог-психологтарды кәсіби даярлауда оқытудың белсенді және интерактивті әдістерін тиімді пайдалану білімді игеру үдерісін белсендендіре түседі, кәсіби іскерліктер мен дағдыны қалыптастырады, оқыту нәтижесін бақылауда ұстауға, практикалық іс-әрекетке қажетті сапаларды дамытуға жағдай жасайды.

Одан бөлек, оқытушылар Socrative, Kahoot, Edmodo және Nearpad жүйелерін білім беру үдерісіне ендіру арқылы студенттермен интерактивті материалдарымен бөлісіп, шынайы уақыт режимінде оқу сапасына мониторинг жасай алады. Оқу материалдарын (электронды оқулықтар, презентациялар, видеосабақтар т.б.) сапалы түрде дайындап алып, соны бірнеше рет, әртүрлі мақсатты аудиторияларда қолдануына болады [4].

Медиамәдениетті қалыптастыру үдерісінде білім беру ресурстары (бағдарламалық қамтамасыздандыру, электронды-білімдік ресурстар, ақпараттық-білімдік порталдар, қашықтықтан оқыту жүйелері, электронды кітапханалар, вебинарлар, телеконференциялар), үдерісті басқару ресурстары (қашықтықтан оқыту, электронды пошта, әлеуметтік желілер, арнайы сайттардағы жеке кабинеттер, медиатека) және техникалық ресурстар (компьютерлер, планшет, мобильді құрылғылар, желілер, бейнелік жүйелер, интерактивті экрандар) пайдаланылғаны жөн [5].

Қорытындылайтын болсақ, жоғары оқу орнының нәтижелі жұмысы – студенттердің медиамәдениетінің қалыптасу деңгейі мен кәсіби дайындығының сапасы арқылы көрінеді. Болашақ мамандарды дайындаудың сапасының өлшемі – студенттердің мемлекеттік білім беру стандартындағы цифрлық біліктілік талаптарына сәйкес анықталған теориялық және практикалық дайындығы арқылы бағаланады.

Болашақ педагогтардың медиамәдениетін қалыптастыруда оқытудың инновациялық формаларын (дәріс, практикум, «дөңгелек үстел», масс-медиа өнімдерінің көмегімен жобаларды құрастыру және қолдау, рефлексия т.б), белсенді және интерактивті әдістерін пайдалану оң нәтижелер береді.

Университеттің медиа кеңістігінің мазмұны бұқаралық ақпарат құралдары арқылы әр түрлі формада және жанрда таралатын және білім беру кеңістігінде негізгі ақпарат көзі болатын медиамәтіндер болып табылады. Білім беру процесін ұйымдастыру барысында құрылған педагогикалық жағдайлар студент пен оқытушының педагогикалық өзара әрекеттесу сапасын белсендендіреді. Әртүрлі жанрдағы және стильдегі медиамәтіндерді талдау және арнайы дайындалған шығармашылық тапсырмаларды орындау студенттердің білімін ғана емес, іскерлігі мен дағдысын қалыптастырады.

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Təhsil və multikulturalizm

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Açar sözlər: multikulturalizm, təhsil sistemi, pedaqoji şərait

Müasir dövrdə milli-mənəvi şüurun formalaşması, şəxsiyyətin əxlaqi, mənəvi keyfiyyətlərə yiyələnməsi - buraya tolerantlıq, dözümlülük, başqalarına hörmət, empatiya kimi keyfiyyətlər də daxildir - cəmiyyətin inkişafında vacib amillərdən sayılır. Məhz buna görə də şəxsiyyətin milli-mənəvi, əxlaqi tərbiyəsi, layiqli insan yetişdirmək problemi dövlətin daim diqqət mərkəzindədir. Azərbaycan Respublikasında təhsilin inkişafı üzrə Dövlət Strategiyasında "məsuliyyətini dərk edən, demokratiya prinsiplərinə və xalqının milli ənənələrinə, insan hüquq və azadlıqlarına hörmət edən, azərbaycançılıq ideyalarına sadiq olan, müstəqil və yaradıcı düşünən vətəndaş və şəxsiyyət yetişdirmək; milli mənəvi və ümumbəşəri dəyərləri qoruyan və inkişaf etdirən, geniş dünyagörüşünə malik olan... kadrlar hazırlamaq" təhsil sisteminin başlıca vəzifələri sırasında qeyd olunur [1]. Burada artıq qeyd etdiyimiz kimi əsas məsuliyyət müəllimlərin üzərinə düşür. Çünki multikultural dəyərlərin qorunması ilə yanaşı, onun gələcək nəsillərə düzgün çatdırılması, öyrənilməsi və mahiyyətinə varılması olduqca önəmlidir. Odur ki, istənilən sahədə Azərbaycan gerçəkliyinin gənclərə aşılanması, xalqın zəngin multikultural keçmişinin, dövlətin mədəni müxtəlifliyin qorunması istiqamətində atdığı addımların təbliği multikultural gələcəyin təminatıdır.

Müəllimin multikultural səriştəliliyinin əsas göstəriciləri aşağıdakılardı:

- multikultural təhsil sahəsində bilik və təcrübə;
- multikultural təhsil texnologiyalarına yiyələnmə;
- müxtəlif milliyyətdən olan insanlarla qarşılıqlı ünsiyyət tərzi;
- multikultural təhsil şərtləri daxilində əxlaqi mövqe [2, 16].

Müəllimin multikultural hazırlıq səviyyəsinin göstəricilərinə isə müxtəlif mədəniyyətlərin nümayəndələrinə hörmətlə yanaşma, onlarla qarşılıqlı ünsiyyət və əlaqə mədəniyyəti, etnik tolerantlıq, mübahisələri həll etmə bacarığı, etik, hüquqi, pedaqoji mədəniyyət kimi şəxsi keyfiyyətlər daxildir. Müəllimin sadalanan multikultural keyfiyyətləri bir-biri ilə qarşılıqlı əlaqədədir və bir-birinə təsir göstərir. Müəllimin multikultural hazırlıq səviyyəsinə təsir göstərən əsas amilləri belə sıralaya bilərik:

Sosiomədəni şərtlər - bunlar geosiyasi, iqtisadi sahəyə; dini, milli və millətlərarası münasibətlərin vəziyyətinə; ölkənin, regionun, dövlətin, ali məktəbin, tələbə kollektivinin inkişaf səviyyəsinə; cəmiyyətin maddi-mənəvi inkişaf dərəcəsinə; cəmiyyətin multikultural şəxsiyyətin formalaşmasına və inkişafına duyduğu ehtiyaca aid olan şərtlərdir.

Pedaqoji şərtlər - burada söhbət ali məktəbin tərkibindən və təhsil texnologiyalarından gedir. Belə ki, müəllimin multikultural hazırlığının təməlində təlim-tərbiyə prosesi durur, onun davranışlarını, insanlarla, xüsusilə başqa etnik mədəniyyətə sahib olanlarla münasibətinin nizamlanmasına təsir göstərir. Elmi-tədqiqat işləri, pedaqoji təcrübənin təşkili də az əhəmiyyət kəsb etmir. Pedaqoji şərait özündə multikulturalizmə dair biliklərin ali məktəbdə tələbə tərəfindən tədricən və sistematik şəkildə mənimsənilməsinə yönəlmiş təlim-tərbiyə prosesini, multikultural mühitdə təlim-tərbiyə prosesinin təşkilində bacarıq və vərdişlərə yiyələnməyi ehtiva edir.

Psixoloji şərtlər - burada isə tələbələrin mənəvi aləmi, onların tələbatları, maraqları, məqsədləri və s. nəzərdə tutulur [3].

Cəmiyyətin gələcəyi onun aldığı təhsil səviyyəsi ilə ölçülür. Qloballaşan dünyamızda hər bir şəxsin mədəni və sosial həyatında müstəqil qərarlar qəbul etməsi, yüksək bacarıqlara malik mütəxəssis, novatorluq qabiliyyətinə malik tolerant vətəndaşların, bir sözlə, cəmiyyətin inkişafının

əsas hərəkətverici qüvvəsi olan insan resurslarının inkişafı dövlətin apardığı təhsil siyasətindən və fərdlərin aldığı yüksək təhsil səviyyəsindən asılıdır. Multikultural dəyərlərin təhsildə təbliği sahəsində həyata keçirilən tədbirlər siyahısına adət etdiyimiz ənənəvi konfranslardan fərqli olan elmi-praktik video-konfranslar keçirilməsi ölkəmizdən kənarda yaşayan soydaşlarımızla, təhsil ictiamiyyəti ilə və eyni zamanda digər mədəniyyətləri təbliğ edən həmkarlarımızla daha sıx əlaqə yaratmağa, onları daha yaxından tanımağa və xalqın hər bir nümayəndəsinin bir-birinə qayğı və hörmətlə yanaşmağa səsləyən bir təşəbbüs hesab edilir.

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ЖАЛПЫ БІЛІМ БЕРЕТІН МЕКТЕПТЕРДЕ ТОҒЫЗҚҰМАЛАҚТЫ ОҚЫТУДЫҢ ТӘРБИЕЛІК АСПЕКТІЛЕРІ

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Аңдатпа

Бұл мақалада автор қазақ халқының ұлттық ойыны тоғызқұмалақтың ерекшелігін көрсетіп, оның құндылығына тоқталған. Болашақ ұрпаққа жалпы білім беретін мектепте тоғызқұмалақты үйрету мен оқыту арқылы адал ұрпақ тәрбилеуге болатындығын атап өткен. Мақала көпшілік оқырманға арналған.

Кілт сөздер: тоғызқұмалақ, тәрбие, құндылық, әдіс, оқыту жүйесі.

Аннотация

В этой статье автор подчеркивает специфику национальной игры казахского народа тогызкумалак и подчеркивает ее ценность. Он отметил, что будущие поколения могут воспитывать честное поколение, обучая и обучая тогызкумалак в общеобразовательной школе. Статья адресована широкому кругу читателей.

Ключевые слова: тогызкумалак, воспитение, ценность, метод, система обучения.

Annotation

In this article, the author emphasizes the specifics of the national game of the Kazakh people togyzkumalak and emphasizes its value. He noted that future generations can educate an honest generation by teaching and educating togyzkumalak in a comprehensive school. The article is addressed to a wide range of readers.

Keywords: togyzkumalak, value, method, learning system.

Қоғамымыздың іргетасын нығайту үшін бүгінгі жастарға үлгілі, өнегелі тәрбие беру - қазіргі мақсат-міндеттердің бірі. Оқушының бойында жалпы адамзаттық құндылықтар мен адамның айналадағы дүниемен жеке тұлғалық қатынасын (*этикалық, эстетикалық, адамгершілік тұрғысынан)* тәрбиелеу мақсатын халқымыздың мәдени рухани мұрасының, салт-дәстүрінің озық үлгілерін оның бойына дарыту арқылы жүзеге асыруға болады. Осымен байланысты халқымызға тән адалдық сияқты қасиеттер, табиғатқа деген қарым-қатынасындағы біздің халыққа тән ерекшеліктер. Жас ұрпақ өз халқының мәдениетімен, асыл мұраларымен ұлттық әдебиеттер арқылы танысып келеді. Халық ойынды тәрбие құралы деп таныған. Ойынды сабақта қолдану оқушылардың ой-өрісін жетілдірумен бірге, өз халқының асыл мұраларын бойына сіңіріп, кейінгі ұрпаққа жеткізе білу құралы. Бірақ оны жүргізуге арналған нақты әдістемелік құралдар жоқтың қасы. Зерттеу жұмысында орыс тілінде жазылған әдебиеттер қолданылды. Соның нәтижесінде қазіргі таңда тақырыптың өзектілігі туындап отыр. Халық педагогикасының адам, отбасы, өскелең жас ұрпақты тәрбиелеу туралы арман-мақсаттарын, орныққан пікірлерін, ұсыныстарын қамтып көрсететін педагогикалық идеялар мен салт-дәстүрлері өткен мен қазіргінің арасындағы байланысты көрсетеді.

Сонымен қоса, тоғызқұмалақ ойынын ойнау, қазақтың ұлттық ойындарын құрметтеу, үйрету басты міндет болып отыр. Дене шынықтыру тәрбиесі балалардың негізгі қозғалыстық қасиеттерін дамыту мен жетілдіруді, дене бітімінің дамуы мен денсаулығын нығайтуды, салауатты өмір салтын ұстануды саналы түрде қажетсінуін қамтамасыз етуі тиіс. Жоғары мектеп жасындағы балалардың дене тәрбиесі олардың дене шынықтыру мен спортпен жүйелі түрде айналысып отыруға жоғары дәрежедегі қажетсінуін дамытады. Сабақтан тыс қосымша сабақтарды балалардың әртүрлі спорт түрлеріне, дене шынықтыру жаттығуларына деген қызығушылығын ескерумен ендіру қажет.

Тоғызқұмалақ ойынын оқытуда практикалық жаттығулар маңызды. Оқушы әр сабақта өзіне қажетті білімді меңгереді. Мұғалімнің бағыт-бағдарымен логикалық ойлауын жетілдіреді. Мұны меңгерген оқушыда күтілетін нәтижеге тоқталар болсақ:

- *Оқушылар бойында ұлттық сана сезім, Отанға деген ыстық махаббат, сезімталдық қасиеттер қалыптасады.*
- *Оқушылардың математика, информатика пәндеріне деген қызығушылықтары, ойлау қаблеттері артады.*
- *Мектепте үйірмелер жұмыс жасайды.*
- *Мектепшілік, қалалық, республикалық сайыстар ұйымдастырылады.*

Мектеп оқушыларына жан-жақты тоғызқұмалақ ойыны туралы жалпы түсінік бере отырып, сондай-ақ ойнау ережелерін үйретуге бағыттап, дағдыландыру нәтиже береді. Ұлттық спорт ойынын үйрету және оны саналы түрде ойнау оқушылардың дүние танымын кеңейтіп,ой-өрісін дамытуға ықпал етеді. Белсенділігі мен қызығушылығын арттырып, оқушы мен ұстаздың бірігіп жұмыс істеуі мүмкіндік береді.

Тоғызқұмалақ сабақтарында табиғи факторларды оңтайлы түрде қолдануға, еңбек пен тынығуды үйлестіріп отыруға, денені жаттықтыру, өз-өзіне массаж жасау және қауіпсіздік техникасының негіздеріне, жүктеменің көлемдері мен қарқындылығын үйлестіріп отыруға, жаттығуларды дұрыс және рет-ретімен орындап отыруға үйрету, ағзаның физиологиялық ерекшеліктері туралы, дене шынықтыру жаттығуларымен айналысу гигиенасы туралы теориялық білімдердің қажетті көлемін беру қажет. Осы жас санатындағы балаларға арнап дене шынықтыру сабақтары мен спортпен айналысудың ұсынылатын көлемі аптасына 1 сағаттан 34 сағатты құрап өткізуге болады.

Қорытындылай келе, ежелден келе жатқан ұлттық ойынды қастерлеуге және оны одан әрі жалғастыруға тәрбиелеу мақсатымыз болып қала бермек. Халықтық педагогиканың ең бір көне тиімді құралдарының біріне жататын бұл ойын түрі логикалық ойлауға бағыт беретінін ескере, оқыту методикасы да заман талабына сай жаңарып отыруы қажет. Ойын арқылы бала қоршаған ортаны өз бетінше зерделейді. Сөйтіп, өзінің өмірден байқағандарын іске асырып, қоршаған адамдардың ісәрекетіне еліктейді. Ойын дегеніміз – адамның ақыл-ойын дамытатын, қызықтыра отырып ойдан-ойға жетелейтін, тынысы кең, алысқа меңзейтін, қиял мен қанат бітіретін ғажайып нәрсе. Ұлы педагог В.И.Сухомлинский: «Ойынсыз, музыкасыз, ертегісіз, творчествосыз, фантазиясыз толық мәніндегі ақыл-ой тәрбиесі болмайды», - деп айтқандай, үнемі жаңа әдіс ұсына ойландыруға бағыттаймыз. Сонда ғана, шәкірттің ақыл-ойы, парасаты ұлттық салт-сананы сіңіру арқылы баии түседі. Мектеп оқушыларын тәрбиелеу құралы ретінде қазақ халқының ойындарын пайдаланудың теориялық-әдістемелік негіздері жасалып, олардың тәрбиелік мүмкіндіктері айқындалған.

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PURPOSE AND OBJECTIVES OF THE STRATEGIC PLANNING PROCESS IN HIGHER EDUCATION

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Abstract

This article examines the purpose and objectives of the strategic planning process in higher education, highlighting how it serves as a crucial tool for aligning institutional goals with dynamic societal needs. Strategic planning enables universities to manage resources effectively, respond to external challenges, and foster long-term growth. This paper explores various stages of the planning process, analyzes successful case studies, and discusses key objectives such as resource optimization, quality assurance, and innovation in teaching and research.

Key words: Education, planning, strategy, student, higher education

1. Introduction

Strategic planning is increasingly recognized as a critical tool for navigating the complexities and challenges faced by higher education institutions (HEIs) today. The higher education landscape is rapidly evolving due to factors such as globalization, technological advancements, shifting labor market demands, and changes in governmental policies. In this context, strategic planning enables HEIs to set clear, actionable goals that align with their mission, values, and vision while adapting to external pressures and trends.

One of the primary reasons strategic planning is essential in higher education is its role in guiding long-term institutional success. Through the strategic planning process, institutions assess their strengths and weaknesses, identify opportunities and threats, and make informed decisions that help them maintain relevance and competitive advantage. Strategic planning allows institutions to anticipate future challenges, address emerging needs, and proactively develop solutions that contribute to student success, faculty development, and research excellence.

Strategic planning also promotes resource optimization, ensuring that financial, human, and physical resources are utilized effectively to support the institution's objectives. In an era of financial uncertainty, HEIs must manage their resources judiciously, avoiding inefficiencies and maximizing their impact. By setting priorities and allocating resources accordingly, strategic planning helps institutions achieve their goals in a sustainable and efficient manner (Khalilov, Karimova & Taghiyev, 2024).

Additionally, strategic planning fosters accountability and transparency within institutions. When HEIs develop a clear strategic plan, they establish benchmarks and performance metrics that can be used to monitor progress, evaluate outcomes, and make adjustments as necessary. This commitment to continuous improvement enhances institutional accountability to stakeholders, including students, faculty, staff, government bodies, and the broader community.

Another key aspect of strategic planning in higher education is its role in fostering innovation. As educational needs and student expectations evolve, institutions are compelled to rethink traditional teaching methods, invest in digital technologies, and pursue interdisciplinary research. Strategic planning encourages HEIs to adopt forward-thinking approaches and explore

new ideas that enhance academic quality, promote inclusivity, and prepare students for a globalized world.

In summary, strategic planning is vital for higher education institutions as it enables them to navigate change, optimize resources, foster accountability, and innovate to meet the demands of a rapidly evolving educational environment. It serves as a blueprint that guides institutions towards fulfilling their mission and achieving sustainable growth.

The purpose of this article is to explore the role of strategic planning in higher education, examining its key objectives, processes, and impact on institutional success. In an era marked by heightened competition, rapid technological advancements, and complex social challenges, strategic planning has become essential for higher education institutions to thrive and remain relevant. This article aims to provide a comprehensive understanding of how strategic planning supports HEIs in achieving their mission, enhancing educational quality, and ensuring long-term sustainability.

By examining the theoretical foundation and practical applications of strategic planning, this article seeks to shed light on the value of strategic management in higher education. It outlines the core components of the strategic planning process, including goal setting, resource allocation, implementation, and evaluation, providing insights into how each component contributes to institutional success (Hill & Jones, 2012).

The article also highlights the specific objectives of strategic planning, such as quality assurance, resource optimization, innovation, and internationalization, offering examples of how these goals are pursued by institutions globally. Through analysis of successful case studies and identification of common challenges, the article aims to provide best practices and recommendations for HEIs looking to enhance their strategic planning efforts.

Ultimately, this article is intended to serve as a resource for educational leaders, policymakers, researchers, and practitioners who are involved in strategic planning within higher education. It provides a framework for understanding the importance of strategic planning and offers practical guidance on how institutions can harness its potential to achieve academic excellence, operational efficiency, and meaningful impact in a changing world.

Theoretical Background of Strategic Planning in Higher Education

Strategic planning in higher education is a comprehensive process that enables institutions to adapt to changing demands, ensure long-term success, and remain relevant in an increasingly competitive global landscape. This section provides a detailed overview of the concept of strategic planning, the historical context that has influenced its development, and the essential components that form its foundation.

Strategic planning is a systematic process for envisioning an institution's future and setting specific goals, initiatives, and resources to achieve that vision. In higher education, strategic planning serves as a blueprint that guides institutions in aligning their mission, values, and objectives with societal needs and expectations. It involves defining clear goals, assessing internal and external environments, developing action plans, and monitoring outcomes to ensure alignment with institutional priorities.

The significance of strategic planning in higher education lies in its ability to provide direction, promote accountability, and enable sustainable growth. Universities and colleges are increasingly influenced by external factors, such as governmental policies, global competition, technology advances, and evolving labor market needs. Strategic planning helps institutions respond to these factors by setting priorities, making informed decisions, and allocating resources efficiently.

In addition to its practical advantages, strategic planning also enhances institutional transparency and accountability. By outlining specific goals and measurable outcomes, strategic

planning allows higher education institutions (HEIs) to communicate their intentions to stakeholders, including students, faculty, government agencies, and donors. This fosters trust and confidence among stakeholders, as they can see the institution's commitment to achieving excellence and fulfilling its mission.

The use of strategic planning in higher education has evolved significantly over the past several decades. Initially, HEIs relied on traditional, hierarchical approaches to planning, focusing on administrative functions and departmental priorities without considering broader, long-term goals. In the mid-20th century, as higher education began expanding rapidly, institutions started facing increased demand for accountability, quality assurance, and financial stability. These pressures highlighted the need for a more structured and forward-looking approach, leading to the early adoption of strategic planning methods (Khalilov, 2022).

In the 1970s and 1980s, HEIs began incorporating strategic planning as a formal process, borrowing concepts from business and management fields. This shift was driven by economic challenges, shrinking government funding, and heightened competition, which forced institutions to adopt more efficient and sustainable practices. During this time, strategic planning focused primarily on financial stability, enrollment growth, and faculty recruitment, aiming to maintain institutional operations amid limited resources.

By the 1990s and early 2000s, globalization, technological advancements, and the rise of international rankings reshaped the higher education landscape. Institutions increasingly prioritized global collaborations, research excellence, and innovation. As a result, strategic planning in higher education became more dynamic and adaptive, integrating flexibility to accommodate rapidly changing environments. Strategic planning shifted towards a holistic, mission-driven approach, with a strong emphasis on student outcomes, community engagement, and institutional reputation (Taleh, 2021).

Today, strategic planning in higher education reflects a balance between traditional priorities—such as academic quality and fiscal responsibility—and emerging challenges like digital transformation, diversity, sustainability, and internationalization. Institutions are now expected to address complex, multidimensional issues, such as preparing students for a globalized workforce, adopting new educational technologies, and promoting inclusivity and equity. This ongoing evolution has solidified strategic planning as an indispensable tool in higher education, enabling institutions to navigate uncertainty while fulfilling their educational and social missions.

Strategic planning is essential in higher education institutions (HEIs) to guide them through a rapidly changing landscape and help them fulfill their mission. It aligns institutional activities with overarching goals, enhances adaptability, and strengthens reputation, all while ensuring sustainable growth. Below is a detailed look at the primary purposes of the strategic planning process in HEIs.

Alignment with Institutional Mission and Vision

Strategic planning serves as a critical tool for aligning an institution's activities with its mission and long-term vision. Every university or college has a unique mission statement that reflects its core values, educational philosophy, and commitments to stakeholders, including students, faculty, alumni, and the surrounding community. The strategic planning process translates these foundational principles into specific, actionable goals and initiatives.

By aligning strategic actions with the institution's mission, HEIs ensure that every department, program, and activity contributes to a unified purpose. For instance, if a university's mission emphasizes research excellence, strategic planning might prioritize investments in research facilities, faculty development, and interdisciplinary collaboration. Likewise, if an institution focuses on community engagement, its strategic plan may highlight partnerships with local organizations and projects that address community needs.

A well-aligned strategic plan not only provides a clear roadmap for achieving the institution's mission but also fosters a strong sense of purpose among faculty, staff, and students. This alignment creates coherence and synergy across the institution, ensuring that resources are directed toward activities that advance the university's goals and contribute to long-term success. As a result, alignment with mission and vision strengthens institutional identity and sets a clear direction for growth and development (Khalilov, 2024).

Higher education institutions operate within a complex environment shaped by numerous external factors, including government policies, economic trends, technological advancements, and evolving social expectations. Strategic planning enables HEIs to proactively respond to these external pressures and adapt to changes that could impact their operations, offerings, and long-term viability.

For example, policy changes—such as adjustments in education funding, research grants, or international student regulations—can significantly affect institutional resources and strategic priorities. Through strategic planning, institutions can anticipate these changes and adjust their strategies accordingly, whether by diversifying funding sources, expanding online learning options, or building new partnerships.

Economic shifts, such as recessions or fluctuations in the job market, also affect the demand for certain academic programs and skill sets. Strategic planning allows institutions to identify high-demand fields, develop programs that align with labor market needs, and equip students with relevant skills. In addition, technological advancements have transformed teaching, learning, and administrative processes, requiring institutions to integrate digital tools and innovative approaches into their operations. Strategic planning helps HEIs incorporate new technologies, develop digital competencies, and explore online education models to stay competitive.

Social changes, such as increasing emphasis on diversity, equity, and inclusion, are another significant pressure. Strategic planning provides a framework for institutions to address these societal expectations, ensuring that their policies, curricula, and campus culture foster inclusivity and provide equal opportunities for all students.

In sum, strategic planning equips higher education institutions with the flexibility and foresight needed to navigate external pressures. By regularly assessing the external environment and adapting strategies as necessary, HEIs can remain resilient, relevant, and responsive to societal needs.

In an increasingly competitive global education landscape, reputation plays a vital role in attracting students, faculty, funding, and partnerships. Strategic planning helps higher education institutions enhance their reputation by promoting academic excellence, strengthening research capabilities, and fostering an environment that attracts top talent.

A strong institutional reputation is often built through quality improvements across various domains, such as program offerings, research output, campus facilities, and student services. Strategic planning facilitates these improvements by setting high standards for academic quality, investing in faculty and staff development, and prioritizing areas that contribute to the institution's public image. For example, HEIs might focus on achieving accreditation for specific programs, enhancing student success rates, or building state-of-the-art research facilities to demonstrate their commitment to excellence (Rowley & Sherman, 2001).

Additionally, strategic planning enables institutions to identify and pursue opportunities that enhance their global presence and reputation. This could include initiatives like expanding international partnerships, participating in high-profile research collaborations, or promoting student and faculty exchange programs. By positioning themselves on a global scale, institutions can attract students and faculty from diverse backgrounds, contribute to international research initiatives, and gain recognition in global university rankings.

Furthermore, strategic planning encourages institutions to embrace a distinct identity that sets them apart from their competitors. Whether an institution is known for its innovative teaching methods, emphasis on sustainability, or commitment to social justice, a strategic plan can highlight and support these unique strengths. A clear, differentiated identity not only strengthens the institution's brand but also appeals to prospective students, faculty, and donors who share similar values.

In conclusion, the enhancement of institutional reputation through strategic planning enables higher education institutions to compete on a global scale, build trust with stakeholders, and foster a lasting positive impact. By prioritizing quality improvements and aligning initiatives with reputation-building goals, strategic planning supports HEIs in establishing themselves as leaders in education and research.

Conclusion

Strategic planning is essential for guiding higher education institutions through an ever-changing landscape, aligning their activities with core missions, and enhancing their adaptability and competitiveness. This article has highlighted the central purposes of strategic planning in higher education, which include alignment with the institution's mission and vision, responsiveness to external pressures, and the enhancement of institutional reputation. By setting clear goals, evaluating internal and external environments, and implementing effective strategies, strategic planning empowers higher education institutions (HEIs) to optimize their resources, ensure accountability, and foster a cohesive institutional identity.

As technological, social, and economic changes continue to reshape the higher education sector, strategic planning will need to evolve to meet new challenges and opportunities. Technological advancements, such as artificial intelligence, data analytics, and digital learning tools, will increasingly influence teaching methods, student support services, and administrative functions. Strategic planning will play a crucial role in integrating these technologies, adapting curricula, and preparing students for a digitalized world. Social changes, such as growing demands for inclusivity and diversity, will require HEIs to develop strategic initiatives that foster an inclusive environment and promote equal opportunities. Additionally, economic fluctuations and workforce shifts will drive institutions to reassess their program offerings and ensure alignment with labor market needs. In response, strategic planning will likely become more agile, data-driven, and interdisciplinary, enabling institutions to proactively address these complex dynamics.

In conclusion, strategic planning is indispensable for higher education institutions aiming to sustain their relevance, competitiveness, and excellence. By providing a structured framework for goal setting, resource allocation, and performance evaluation, strategic planning supports HEIs in navigating uncertainty and maximizing their impact. As the higher education landscape continues to transform, institutions that prioritize strategic planning will be better equipped to thrive and make meaningful contributions to society. Ultimately, the continuous adaptation and refinement of strategic planning processes will allow HEIs to fulfill their mission, uphold academic quality, and prepare students to succeed in an evolving world.

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Анализ уровня знаний и опыта использования блочных конструкторов в образовательной практике: результаты исследования среди студентов и преподавателей

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Аннотация. *В статье представлены результаты исследования, посвящённого уровню знаний и опыту использования блочных программных конструкторов среди студентов и преподавателей из трёх университетов: Гази университета (Турция), Казахского национального женского педагогического университета и Жетысуского государственного университета (Казахстан). Проведённый анализ выявил значительные различия в опыте и восприятии данных инструментов, а также продемонстрировал их положительное влияние на развитие алгоритмического мышления и мотивации студентов. В статье предложены рекомендации по популяризации и интеграции блочных конструкторов в образовательный процесс, а также определены направления для дальнейших исследований, включая изучение их влияния на развитие других когнитивных навыков, таких как решение проблем и критическое мышление.*

Ключевые слова: *блочное программирование, когнитивные навыки, обучающиеся, логическое мышление, цифровые образовательные технологии.*

В современных образовательных системах всё большее внимание уделяется интеграции цифровых технологий, способствующих развитию ключевых когнитивных навыков у обучающихся. Одним из перспективных инструментов для этого являются блочные программные конструкторы, которые упрощают процесс изучения программирования и развивают логическое и алгоритмическое мышление. Они делают сложные концепции программирования доступными для начинающих, особенно в школьной и университетской практике, что способствует более эффективному усвоению материала и подготовке студентов к реальной цифровой среде. Как отмечает Митч Резник, один из разработчиков Scratch, «блочные конструкторы помогают учащимся понять программирование как творческий процесс, что особенно важно для формирования навыков XXI века» (Resnick, 2013). Актуальность исследования обусловлена необходимостью повышения цифровой грамотности и адаптации образовательных подходов к современным требованиям.

Целью исследования является выявление уровня знаний и опыта в использовании блочных программных конструкторов среди студентов и преподавателей, а также

определение их отношения к применению данных инструментов в образовательной практике. Для достижения этой цели были поставлены следующие задачи:

1. Оценить степень распространённости и популярности использования блочных программных конструкторов среди респондентов.
2. Проанализировать разницу в знаниях и опыте между студентами и преподавателями.
3. Определить основные преимущества и недостатки использования этих конструкторов с точки зрения участников опроса.
4. Разработать рекомендации по эффективному внедрению блочных программных конструкторов в учебный процесс.

Существующие исследования показывают, что использование блочных программных конструкторов, таких как Scratch и AppInventor, способствует более глубокому пониманию основ программирования и развитию критического мышления. Например, в своей работе Дэвид Вайнер (Weiner, 2017) подчёркивает: «визуальные среды программирования, особенно в контексте образования, предоставляют уникальную возможность облегчить изучение алгоритмов и структур данных благодаря интуитивно понятному интерфейсу». Многие авторы отмечают, что визуальные среды программирования помогают учащимся легче воспринимать сложные алгоритмические конструкции и применять их на практике.

Кроме того, исследования Кэтрин Купер (Cooper, 2020) демонстрируют, что «раннее введение в блочное программирование стимулирует интерес к информационным технологиям и мотивирует студентов к дальнейшему изучению компьютерных наук». Однако остаются вопросы относительно эффективности и долговременного влияния таких конструкторов на развитие профессиональных навыков у студентов университетов, что требует дальнейшего изучения.

Опрос был организован с целью сбора данных о знаниях и опыте использования блочных программных конструкторов в образовательной практике. Исследование проводилось с использованием анкетирования, включающего как закрытые вопросы (для количественного анализа), так и открытые вопросы (для получения качественной информации). Опрос был проведён в трёх университетах: Гази университет (кафедра компьютерной инженерии, город Анкара, Турция), Казахский национальный женский педагогический университет (город Алматы, Казахстан) и Жетысуский государственный университет (город Талдыкорган, Казахстан). Анкеты были отправлены участникам в электронном виде, что обеспечило удобство и оперативность сбора данных.

Характеристика выборки

В исследовании приняли участие 173 респондента, которые были разделены на две основные категории: студенты и преподаватели. В выборку вошли:

- Студенты: 113 человек, из которых 38 были из Гази университета, 35 из Казахского национального женского педагогического университета и 40 из Жетысуского государственного университета. Студенты представляли различные уровни обучения (бакалавриат и магистратура) и имели разный опыт работы с блочными конструкторами.
- Преподаватели: 60 человек, из которых 20 представляли Гази университет, 20 — Казахский национальный женский педагогический университет и 20 — Жетысуский государственный университет. Преподаватели были специалистами в области информатики, математики и педагогики.

Используемые методы сбора данных

Для получения разносторонних данных были применены как количественные, так и качественные методы сбора информации:

- Количественные данные: собраны с помощью закрытых вопросов анкеты, которые позволили определить степень осведомлённости и частоту использования блочных программных конструкторов среди участников.
- Качественные данные: собраны с помощью открытых вопросов, предоставивших участникам возможность выразить свои мнения, поделиться опытом и высказать предложения по улучшению использования этих инструментов в образовательной среде.

Количественные результаты

Анализ данных выявил различия в уровне знаний и частоте использования блочных программных конструкторов среди студентов трёх университетов. В Гази университете средний уровень знаний студентов составил 3.2, а частота использования — 5 раз в месяц. В Казахском национальном женском педагогическом университете студенты показали более низкий уровень знаний (2.8) и использовали конструкторы реже, в среднем 3 раза в месяц. В Жетысуском государственном университете средний уровень знаний студентов был самым высоким — 3.5, и частота использования достигала 7 раз в месяц. Эти данные указывают на более активное использование и лучшее понимание блочных конструкторов студентами Жетысуского университета (Таблица 1).

Таблица 1. Количественные данные по результату опроса студентов

Университет	Количество студентов	Средний уровень знаний (по шкале 1-5)	Частота использования (раз в месяц)	Процент, считающих блочные конструкторы полезными (%)
Гази университет	38	3,2	5	82
Казахский нац. женский пед. университет	35	2,8	3	74
Жетысуский университет	40	3,5	7	88

Качественный анализ показал, что студенты всех трёх университетов положительно оценили использование блочных программных конструкторов в учебном процессе. Студенты Гази университета отметили, что блочные конструкторы помогают развивать логическое мышление, но выразили желание видеть больше примеров их практического применения в реальных задачах. Студенты Казахского национального женского педагогического университета подчеркнули доступность этих инструментов, однако отметили необходимость в дополнительных учебных материалах для более глубокого освоения. Студенты Жетысуского государственного университета высоко оценили эффективность конструкторов в изучении алгоритмических концепций и отметили их важность для подготовки к профессиональной деятельности.

Анализ результата опроса среди преподавателей

Преподаватели всех трёх университетов высоко оценили эффективность использования блочных программных конструкторов в образовательной практике. Они отметили, что эти инструменты способствуют развитию алгоритмического мышления у студентов и упрощают понимание базовых принципов программирования. Преподаватели Гази университета подчеркнули, что блочные конструкторы помогают быстро заинтересовать студентов и вовлечь их в изучение информационных технологий. Преподаватели Казахского национального женского педагогического университета

отметили, что использование таких инструментов повышает мотивацию студентов, особенно тех, кто не имеет предварительного опыта программирования. В Жетысуском государственном университете преподаватели выразили мнение, что блочные конструкторы идеально подходят для начального этапа обучения программированию и подготовки студентов к изучению более сложных языков.

Университет	Количество преподавателей	Оценка простоты использования (по шкале 1-5)	Оценка влияния на мотивацию студентов (по шкале 1-5)	Оценка полезности для преподавания основ программирования (по шкале 1-5)
Гази университет	20	4,5	4,2	4,3
Казахский нац. женский пед. университет	20	4	3,8	4,1
Жетысуский университет	20	4,7	4,6	4,8

Анализ данных показал, что преподаватели из всех трёх университетов высоко оценивают простоту использования и эффективность блочных программных конструкторов в преподавании основ программирования. Средняя оценка простоты использования составила от 4.0 до 4.7, что свидетельствует о доступности и интуитивности этих инструментов для образовательной практики. Влияние на мотивацию студентов также получило высокие оценки, особенно среди преподавателей Жетысуского государственного университета, что указывает на потенциал блочных конструкторов в повышении вовлечённости студентов. Полезность для обучения основам программирования была оценена наиболее высоко, что подчеркивает их важную роль в подготовке студентов к более сложным концепциям программирования.

Выявленные тенденции свидетельствуют о необходимости широкой интеграции блочных программных конструкторов в учебные программы по информатике и математике. Высокие оценки эффективности и простоты использования означают, что такие инструменты могут стать основой для формирования базовых навыков программирования у студентов. Кроме того, положительное влияние на мотивацию учащихся может привести к увеличению их интереса к техническим дисциплинам и улучшению академических результатов. Таким образом, преподаватели могут использовать блочные конструкторы для создания более интерактивного и увлекательного образовательного опыта.

Анализ результатов опроса позволил сформировать следующие рекомендации по внедрению блочных конструкторов в образовательный процесс, которые направлены на максимизацию их эффективности и более широкое внедрение в учебную практику:

1. Внедрение и проведение кружка: Организация и проведение кружков по блочному программированию являются важным элементом для повышения интереса и вовлечённости студентов в изучение программирования. Такие кружки могут проходить в формате дополнительных занятий вне основного расписания, что создаст пространство для углубленного изучения технологий и выполнения творческих проектов. В рамках кружков студенты смогут работать над реальными задачами, развивать навыки командной работы и укреплять свои знания в интерактивной и поддерживающей среде.

2. Обучение преподавателей: Для успешного внедрения блочных программных конструкторов в образовательный процесс важно уделять внимание профессиональному развитию преподавателей. Рекомендуется разрабатывать и проводить программы повышения квалификации, которые помогут педагогам овладеть методиками преподавания с использованием данных инструментов. Эти программы должны включать как теоретические аспекты, так и практическую подготовку, что обеспечит преподавателей необходимыми знаниями и навыками для эффективного обучения студентов.

3. Обеспечение доступных ресурсов: Для того чтобы студенты и преподаватели могли легко освоить блочные программные конструкторы, необходимо создать и распространить учебные материалы и методические пособия. Эти ресурсы должны быть структурированы и охватывать все аспекты использования конструкторов, начиная с базовых понятий и заканчивая сложными задачами. Наличие таких материалов значительно упростит процесс обучения и обеспечит поддержку на всех этапах освоения технологий.

4. Популяризация технологий: Для повышения интереса к блочным программным конструкторам и стимулирования их активного использования необходимо проводить мероприятия, такие как семинары, мастер-классы и конференции. Создание сообществ практики, где преподаватели и студенты смогут обмениваться опытом, делиться идеями и обсуждать передовые методы использования конструкторов, также окажет положительное влияние. Такая популяризация поможет сделать технологии программирования более доступными и привлекательными для широкой аудитории, способствуя повышению цифровой грамотности и подготовке специалистов, соответствующих требованиям современного общества.

Важным направлением дальнейших исследований является изучение влияния блочного программирования на развитие других когнитивных навыков у студентов, что открывает возможности для более глубокого анализа образовательного потенциала этих инструментов. Будущие исследования могут быть сосредоточены на изучении того, насколько использование блочных программных конструкторов влияет на развитие других когнитивных навыков у студентов, таких как навык решения проблем, критическое мышление и способность к принятию обоснованных решений. Важно понять, как эти инструменты способствуют более широкому когнитивному развитию, выходящему за рамки программирования, и каким образом они могут быть интегрированы для повышения общей учебной успеваемости.

Также стоит рассмотреть, какие методики и подходы наиболее эффективно развивают эти когнитивные навыки с помощью блочных программных конструкторов. Выявление ключевых тенденций в этом направлении позволит создать основу для разработки следующих этапов проекта и обеспечит более глубокое понимание роли визуального программирования в образовательной среде. Полученные данные помогут улучшить учебные программы и расширить возможности использования технологий для всестороннего развития студентов.

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Analysis of illuminated manuscript art and integration into traditional Kazakh art

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Annotation. This article analyzes and explores the images and aspects of illuminated manuscripts, their technical features, design and analysis of individual elements and depicted objects. The purpose of this work is to conduct a deep and comprehensive analysis of graphic images presented in works of medieval art in order to identify and study the elements and aspects that determined the perception of images of traditional Kazakh art. When writing a scientific article, various methods of scientific analysis were used: synthesis, analytics, comparative analysis, dialectical approach, search and selection of facts. The article examines and analyzes the elements of objects of early medieval art and their synthesis from the creativity of cultures and the possibility of their integration into modern spheres of graphic images and integration it in traditional Kazakh art replicas. This information can be used for subsequent synthesis and application in the modern graphic environment, in design development, as well as in the study of the processes of modern graphic creativity
Keywords: *design, kazakh, analysis, medieval art, graphic image, creativity, art, society.*

Introduction

This article analyzes and researches the creativity of graphic images in medieval art.
The Middle Ages, which lasted from the 5th to the 15th century, epitomized a period of profound cultural changes and transformations associated with Christianity, feudalism and scientific discoveries. During this period, art acquired special importance, becoming an integral part of the spiritual and socio-cultural development of Western society. Graphic images created by artists of that time not only served as an aesthetic decoration of works of art, but also conveyed complex value systems, worldviews and religious beliefs. The analysis will focus on the analysis of graphic images in the context of medieval art, paying special attention to their symbolic semantics, artistic features, graphic images and the influence of cultural factors. Analyzing creativity, it will be possible to understand the creative and design approach to creativity and the features of graphic images and pictures, the choice of colors and shapes. In particular, the integration of Western European art and contemporary art and traditional images from Kazakh society into the modern graphic environment where traditional Kazakh art is used and shared.

Materials and methods of research

This scientific study was written as a result of a review of domestic and foreign sources devoted to the topic of the work, an analysis of illustrations and documented and digitized art objects, illuminated manuscripts and photographs of architectural objects, figure 1. The methodological basis of scientific work includes various research methods of both general scientific and private scientific directions: analysis and synthesis, deduction and induction, dialectical, comparative, method of abstraction, logical, method of formalization, axiomatic, the use of which allowed to fully illuminate the presented topic.

Figure 1. Three Wise Men are following the Star of Bethlehem. An example of medieval creativity. (https://www.getty.edu/art/exhibitions/canterbury/stalbans.html)

In medieval Western art, graphic images played a key role in conveying various messages, from religious to socio-cultural. Symbolism and iconography: Graphic images in medieval art were saturated with symbolism and could have a deep and meaningful meaning. For example, images of saints, angels, devils, as well as various attributes and symbols such as the cross, the phoenix bird, the peacock, etc., often had their own unique iconography that conveyed certain ideas and concepts. Stylistics and technique: Medieval art is often characterized by certain stylistic features, such as simplified forms, hierarchical plane, golden background, etc. The technique of drawing and painting also had its own characteristics, such as the use of tempera, mosaics, miniatures and engravings. Regarding the Kazakh traditional art, it refers to ornamental techniques and images of plant and animal characters in its technique of execution and motives, figure 2. The basics of the images in modern time, are optimal minimalism and new resurgence of detailed art and use of detalization for better graphical work, figure 3.

Figure 2. Example of use, use Kazakh traditional art and ornament imagery in modern art. Almaty mosaic.
(https://pikabu.ru/story/mozaichnoe_panno_iz_smaltyi_enlik_kebek_kenbaev_m_tsivchinskiy_n_1965_god_9548743)

Data analysis and recording methods.
Familiarization with medieval objects of material culture in the form of digitized and scanned images of illuminated manuscripts and psalters, as well as books with examples of late medieval illustrations and engravings. As well as the search and development of image synthesis based on illustrations.

Figure 3. An image created on the basis of images and Kazakh traditional art and modern techniques. By Shugyla Zhussipkyzy (https://www.behance.net/gallery/171826183/Kazakh-style?tracking_source=search_projects|kazakh+style+&l=1)

Study and analysis. The study of literature to find information and analogues is the opinion and ideas of those who studied medieval art, made analyses of the creativity of that time in the context of time and culture and from this was able to develop models or certain patterns and patterns. Familiarization with other works also gives a pattern of behavior and design of your work, increasing its quality and formal appearance.
Based on illuminated manuscripts, illustrations, murals/ frescoes and objects of the material creative environment, I tried to work with existing cultural and visual images – I studied analogues for replication and synthesis in the modern graphic environment of them.
I took the classical period of the 5th century BC as the basis for the development of images, but only by inspiration, since the main period of work on images was the early Middle Ages of the 5th century AD and the culture of the Mediterranean, in which ancient elements are visible. Modeling of objects and graphic images based on the studied characteristics and features that can be identified by analysis and observation, on the basis of which the synthesis and design of the model is already taking place. Based on illustrated manuscripts and marginalia, which were the main illustrations in them, my character style, with the initial low polygonality of the graphics, tends to grotesque proportions and caricature, emphasizing the features of the characters and their character. The expression of various features of distorted proportions and the development of their character in their appearance, figure 5.

Figure 5. Integrated art with usage of illuminated manuscript art, for modern replication based on tempera pains technique.

Data analysis and recording methods.

Modern use of traditional Kazakh arts, usually engages in creativity sphere, mostly of practical use, such as: use of ornamentation for modern graphical design spheres, typography and printable products, like gifting cards or toybastar/тойбастар – small gifts/boxes that gifted in case of holyday or event, figure 6

Figure 6. Example of traditional Kazakh art in modern graphic visual sphere. Toybastar example with use of traditional ornament (https://vipcards.kz/)

A mural is a type of monumental painting on the walls of architectural structures. This word comes from the Spanish muro, which means "wall". Changing an entire city for the better is a complex job that is not always noticeable to residents at first glance. But art managers and contemporary artists create projects such as murals to decorate the city, remind people of important events and eternal values. These images on the facades of houses transform the city and give residents new emotions. Images can range from ornamental classical examples of Kazakh steppe nomad art, with use of floral and bestial imagery as elements/chains of ornament and also more modern renditions of human images, with traditional Kazakh clothes or aspects which indicate use and culture mark.

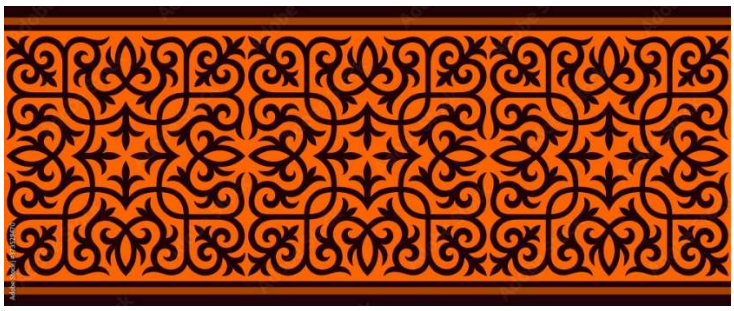


Figure 7. Example of vector image, based on traditional Kazakh Art. Use of floral ornamentation which was prevalent in carpet making and other crafts of medieval time. (https://stock.adobe.com/br/images/strip-of-plant-patterns-ethno-style-kazakh-ornaments-horizontal-patterned-design-traditional-patterns-of-kazakhs-ancient-turkic-ornaments-traditions-of-kazakhstan-decorative-art-of-nomads/373529470)

Figure 8. Example of in city mural, monumental art piece which can use and integrates traditional Kazakh art. (https://the-steppe.com/obshestvo/istoriya-sozdaniya-muralov-kto-i-kak-risuet-na-fasadah-zhilyh-domov)

Such average responses were obtained from a survey of a focus group of 16 respondents, young people from 20+/-years and 30+, gathered in groups from different interests and language groups for 10 days, by interviewing a survey without a key-answer survey.

The survey was conducted among two language groups, Russian-speaking and English-speaking. One of the main categories of questions was in the interview format.

As an example, the first and tenth questions:

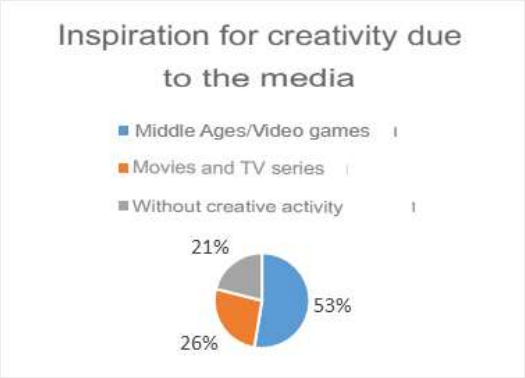
1. Знакомы ли вы со средневековье? Если да, то опишите как.

1. Are you familiar with the Middle Ages? If yes, please describe it.

10. Есть ли пример медиа, который вас вдохновил на творческую деятельность или подвигнул им заняться?

10. Is there any example of media that inspired you to become an artist or encouraged you to engage in art/creativity? Can you name it?

The majority of respondents (41%) replied that they had no knowledge of the Middle Ages or interest in having examples of close acquaintance with creativity.



Total: Research and survey forms indicate a variety of responses from participants, but the main factors they paid attention to were the atmosphere and style of the art. During the discussion of graphical images, the participants most often expressed their admiration if the piece could immerse them in the atmosphere of the product media-world and convey elements of everyday life. They noted the importance of how the game creates a unique environment and allows you to feel like part of a virtual environment. In addition, the style of play played an important role for the focus group participants. Thus, the atmosphere and style turned out to be the key factors that the focus group participants paid attention to when evaluating and discussing video games. What is very important is the analysis of medieval creativity with a bright graphic theme and color palette, and the theme of grotesque and Gothic, as well as the formats of fantasy and immersiveness of medieval themes and mythologies. The very possibility of converting creatures of mythology and transferring the ideas of grotesqueness and symbolism of the Middle Ages into the graphic environment is more than a demanded topic for the modern ethnic cultures. Since in the current time, due to the overabundance of realistic imagery and abstract art, there is increased demands of modern graphic inspired by old practices, especially if certain techniques and styles can be integrated to inspire and show modern culture of certain groups. This can lead to imagery being an important part of international dialogue through art and visual imagery of 'Today'.

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THE ROLE OF SPOTIFY MUSIC PLATFORM IN ENHANCING LISTENING SKILL IN FLE

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ABSTRACT
Proficiency in English is increasingly recognized as a vital skill for communication, cultural exchange, and personal growth. Among the different language skills, listening comprehension stands out as crucial, as it directly impacts how we interact in conversations and understand spoken language. Traditionally, listening skills were developed through textbook exercises in classroom settings, but with the rise of digital media and music streaming platforms like "Spotify", learners now have exciting new opportunities to enhance their listening abilities outside of the classroom. This article explores how "Spotify" can play a pivotal role in improving listening comprehension in foreign language education. With its extensive collection of songs, podcasts, and other spoken content, "Spotify" allows learners to immerse themselves in authentic audio experiences that make learning engaging and relevant. The article aims to show how students can use "Spotify" to boost their vocabulary, refine their pronunciation, and grasp complex linguistic structures. It also evaluates the effectiveness of incorporating "Spotify" into language curricula by examining factors such as student motivation and engagement. Ultimately, "Spotify" not only supports vocabulary and phonetic development but also encourages social interaction among learners, enriching their overall language skills and cultural understanding.

KEYWORDS:
Listening comprehension, foreign language education, Spotify, vocabulary acquisition, pronunciation improvement, digital learning tools, authentic audio experiences, language proficiency.

INTRODUCTION

Proficiency in English has become a critical skill for communication, cultural exchange and personal growth. Among language skills, listening comprehension plays an important role, as it affects the way of people's communication in real-life conversations and their understanding of spoken speech. In conventional teaching methods and formal classroom settings, this skill was developed through listening exercises found in textbooks. However, with the rise of digital media and musical streaming services, new opportunities have appeared for learners to strengthen their listening skills outside ordinary settings.

This article aims to explore the role of the "Spotify" music platform in enhancing listening comprehension skills within foreign language education. With its vast library of songs, podcasts, and spoken-word content in multiple languages, "Spotify" provides language learners with an opportunity to immerse themselves in authentic audio experiences.

To achieve this, the article will focus on several key objectives: it will explore how learners can utilize Spotify's content to strengthen vocabulary; improve pronunciation; and better understand complex linguistic structures. Additionally, it will evaluate the effectiveness of

integrating “Spotify” into foreign language curricula, assessing factors such as student motivation, engagement, and listening proficiency.

Listening on music platforms allows understanding of phonetics and pronunciation through rhythms and patterns of song which they are listening to. As well, it can aid in vocabulary acquisition, as well as engaging with lyrics not only help learners familirize with commonly used colloquial expressions and idiomatic phrases but also stimulates critical thinking as they analyze the messages and themes.

Exposure to authentic language through music and podcasts can enhance listening comprehension and also overall language proficiency. Regular engagement with spoken language in FLT - whether through songs, podcasts or audiobooks can lead to improved listening skills, vocabulary retention and cultural understanding. As learners become more accustomed to the rhythms and tones of spoken English language, it may help to comprehend and respond in real-life conversations. By integrating “Spotify” into their listening practice, learners can transform passive listening into an active listening experience. Furthermore, the role of social interaction in language learning cannot be overlooked. Platforms like “Spotify” reassure learners to share their favorite tracks, discuss podcast episodes, and even collaborate on playlists, fostering a sense of community and engagement. This social dimension adds another layer of motivation, as learners connect with peers who share similar interests and goals. In this way, digital music platforms can complement traditional classroom dynamics, promoting collaborative learning and peer support.

“Spotify”, as a mobile platform, can significantly contribute to enhancing listening skills in foreign language education. By offering an extensive selection of music, podcasts, and other audio content in various languages, it provides learners with the opportunity to immerse themselves in authentic listening experiences. Klimova (2019) highlights the effectiveness of using mobile devices with relevant software to improve language learning, and “Spotify” aligns with this concept by being accessible on smartphones, tablets and laptops allowing students to practice listening skills anytime, anywhere.

Moreover, Spotify’s integration of features like lyrics for songs and transcripts for podcasts makes it a powerful tool for language learning. These features allow users to follow along with spoken or sung content, bridging the gap between listening and reading comprehension. By replaying sections, adjusting playback speed, or creating personalized playlists of language-specific content, students can practice at their own pace. This flexibility not only enhances the learning experience but also reinforces vocabulary and pronunciation in an engaging and effective manner, aligning with the effectiveness of mobile learning tools emphasized by Klimova.

According to Afriyuninda and Oktaviani (2021), the research shows that many students spend several hours a day listening to music, particularly English songs, and they believe it helps improve their listening and pronunciation skills. Most students have been interested in music since they were in elementary school and prefer listening to native English-speaking singers. They also tend to follow the latest releases from their favorite artists and use music apps like “Spotify” regularly. English songs, especially popular genres like pop, jazz, and rock, are often listened to by students to help with their language skills. Additionally, they find that English songs create a lively and engaging atmosphere in the classroom, boosting their interest and participation in lessons.

METHODOLOGY

With the increasing integration of technology into education, digital platforms like “Spotify” have transformed traditional learning models, providing innovative ways to enhance language acquisition skills. This article explores Spotify's role in strengthening listening

comprehension within the context of foreign language education, particularly focusing on enhancing vocabulary, pronunciation, and comprehension of complex linguistic structures. Grounded in research from scholars such as Rahma Meisa, Farid Alam, Agus Rofi'i, Rahma Ilyas, Rama Dwika, Serikbayeva, Kabdurakhmanova, Gorbunova and Kisileva this study investigates the benefits and challenges associated with using Spotify as a pedagogical tool for improving listening skills.

Meisa (2023) and her colleagues highlight how integrating "Spotify" into English listening lessons opens up a treasure trove of content. With its extensive library, "Spotify" allows students to immerse themselves in a variety of audio experiences—from music to podcasts—exposing them to different accents and cultural contexts. This real-world exposure is invaluable for language learners, as it helps them grasp the nuances of everyday conversation and the rhythm of the language they are studying.

Furthermore, the research by Alam and his team (2023) emphasizes the importance of strategic listening. They found that using Spotify's features, like creating playlists of favorite songs or podcasts, can encourage repeated listening. This repetition is key to mastering difficult concepts. By actively engaging with content, learners can familiarize themselves with the sounds and structures of the language, making it easier to understand more complex phrases over time.

Pronunciation is another area where "Spotify" shines. Listening to songs can help students develop their speaking skills by mimicking the way native speakers sound. Meisa's (2023) findings indicate that through music, learners can get a feel for intonation and rhythm, essential elements of spoken language. The diverse array of content available on "Spotify" allows students to hear various accents and pronunciations, which helps them adapt to different speaking styles.

Spotify's vast selection also includes content that showcases complex linguistic structures, such as interviews or news reports. According to Alam and colleagues (2023), this exposure can be particularly beneficial for learners. By listening to authentic materials, students encounter sentence structures and idiomatic expressions that textbooks often overlook. This real-world language use enriches their understanding and prepares them for genuine conversations.

This research done by Serikbayeva (2018) examines how Kazakh popular music affects students' motivation to learn the Kazakh language as a foreign language. The findings are mixed: while quantitative data does not show a strong correlation between music and motivation, students who frequently listen to Kazakh music often feel it positively impacts their motivation. However, this perception does not always lead to active learning behaviors, suggesting that personal, self-driven effort may be necessary for music to effectively support language learning.

Qualitative data offers a different perspective, as students report feeling more motivated to learn Kazakh when exposed to Kazakh music. This feeling of motivation, however, is more psychological than practical, as it doesn't consistently lead to improved language skills or behaviors. The research by Serikbayeva (2018) suggests that incorporating music into language learning could potentially enhance motivation by connecting with students' cultural interests. Yet, more research would be needed to fully understand the long-term impact on language proficiency.

The research completed by Kabdurakhmanova (2024) highlights the multifaceted role of music in education, particularly for youth learning a foreign language. According to the research, music is deeply integrated into educational systems, especially in countries like Russia and Uzbekistan, where it serves as a foundation for both talent development and well-

rounded education. In high schools, teachers identify and nurture musical talents in students, assigning tasks that align with individual skills and informing parents of their child's inclinations. Competitions and choirs offer platforms for young musicians to gain recognition and build confidence, while music education itself is described as rigorous and traditional, covering topics from the history of musical instruments to the analysis of compositions.

Beyond technical skills, music education fosters creativity, imagination, and emotional expression. Music lessons allow students to process emotions, develop coordination, and practice discipline. Furthermore, music's therapeutic effects are emphasized: rhythm, melody, and harmony positively influence students' mental and physical well-being, reducing stress and enhancing mood. Engaging with music helps students learn teamwork, listening, and empathy,

which are skills that extend beyond the music classroom and are beneficial for both academic and professional success.

The Russian authors Gorbunova and Kisileva (2020) discuss the integration of music into foreign language education, particularly through the topic of "Seasons in Music," which aligns with environmental studies in elementary education. They emphasize that music is a natural element of life, and starting the study of musical art with pieces that depict nature is both intuitive and effective. The goal is to develop children's observation skills and encourage them to describe their impressions of nature through words. This approach fosters vocabulary development, enhances listening skills, and promotes creativity.

The lesson plan is structured around listening to short, programmatic music pieces that are easy to follow, allowing children to engage with the music in a playful, interactive manner. The "music collections" game, for example, encourages children to describe music using individual words, building a collective vocabulary. This form of learning helps children actively participate without needing to write down every detail, as technology (like a computer screen) is used to display and record their responses.

Incorporating games and activities like associative series using pictures, poems, and drawings encourages emotional engagement with the music, allowing students to connect music with other forms of art. In the final lesson, children demonstrate their understanding by presenting their collections of musical impressions and taking part in a quiz, which reinforces their learning. The use of technology further supports this process, with tasks like identifying composers, naming music pieces, and selecting illustrations.

Gorbunova and Kisileva (2020) also highlight the importance of creative tasks such as composition and solfeggio in music education. These activities help children develop their creative abilities and foster a deeper understanding of music. By integrating these methods, teachers can promote a holistic approach to learning, where creativity, observation, and language development go hand in hand.

RESULTS

The data analysis in this research employed a qualitative approach. This qualitative data aimed to explore and explain how "Spotify" users leverage the platform to improve their listening skills in foreign language learning. To gather data, the researchers used instruments like observations, open-ended questions, in-depth interviews (conducted via audio or video), and field notes to capture participants' behaviors and experiences in their natural settings. The researchers conducted a survey on Google Forms platform.

Participants included "Spotify" users among 3rd- and 4th-year students, as well as English language teachers working in schools, educational centers, and language institutes. The researchers administered a questionnaire to 21 participants. This questionnaire contained 25 statements; for 15 of these, participants responded on a Likert scale ranging from Totally

Agree, Agree, Neutral, Disagree and Totally Disagree. The remaining 10 items offered varied response options depending on the question's requirements.

DISCUSSION

The data gathered from the survey will be descripted in the form of diagrams and screenshots from Google Forms. Below is the tabulated data obtained by the researchers from the questionnaire.

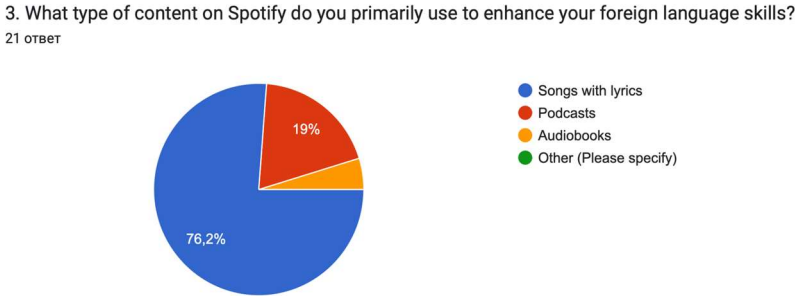

Figure 1. Type of content used in "Spotify" primarily

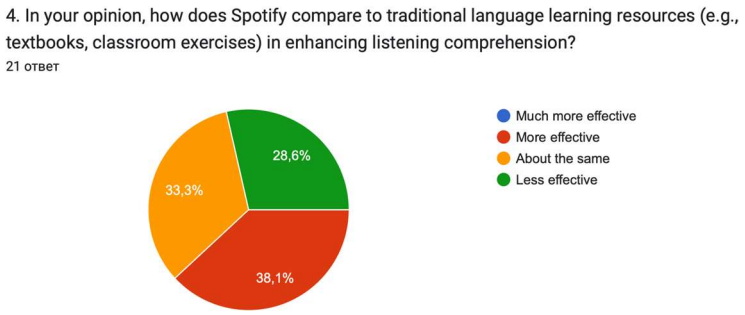

Figure 2. Comparison of "Spotify" to traditional language learning resources

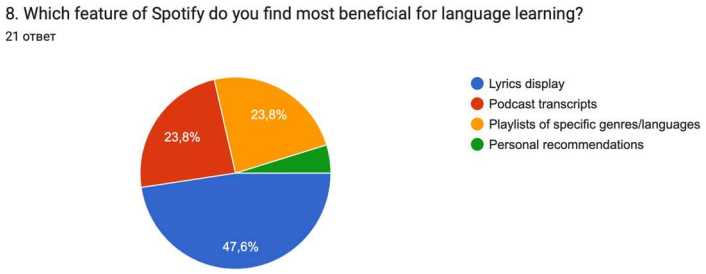

Figure 3. Features of "Spotify" which are the most beneficial

The survey results provide insight into how learners utilize Spotify as a tool to enhance their foreign language skills and how they perceive its effectiveness compared to traditional language-learning resources. According to the data, the majority of respondents (76.2%) primarily engage with songs featuring lyrics on Spotify to aid in language learning, while a smaller proportion use podcasts (19%) and audiobooks (4.8%) for similar purposes (Figure 1). This preference for music with lyrics aligns with the theory that lyrical content in songs can improve vocabulary retention and pronunciation, as noted by previous studies on music's role in language acquisition.

Regarding Spotify's effectiveness relative to conventional language-learning tools, 38.1% of

participants consider Spotify to be more effective, with 28.6% viewing it as much more effective than textbooks or classroom exercises for enhancing listening comprehension (Figure 2). A significant portion (33.3%) believes that Spotify's efficacy is comparable to traditional methods, suggesting a balanced view among users on its role as a supplementary tool rather than a replacement.

The survey further reveals which Spotify features are deemed most beneficial for language learning. Nearly half of the respondents (47.6%) value the lyrics display feature, which supports comprehension by enabling users to read and listen simultaneously, facilitating vocabulary acquisition and pronunciation practice. Podcast transcripts (23.8%) and playlists tailored to specific genres or languages (23.8%) are also recognized as valuable resources, while

personalized recommendations are less frequently cited (4.8%) (Figure 3). These findings suggest that Spotify's interactive and content-rich features are perceived as instrumental in supporting language learners, particularly in improving listening skills and familiarity with target language structures.

These data highlight Spotify's potential to complement traditional language-learning methods by providing accessible and culturally engaging content that resonates with learners' preferences and listening practices. The preference for lyrics and podcast content suggests a focus on auditory learning, which aligns with the platform's unique offerings in language development.

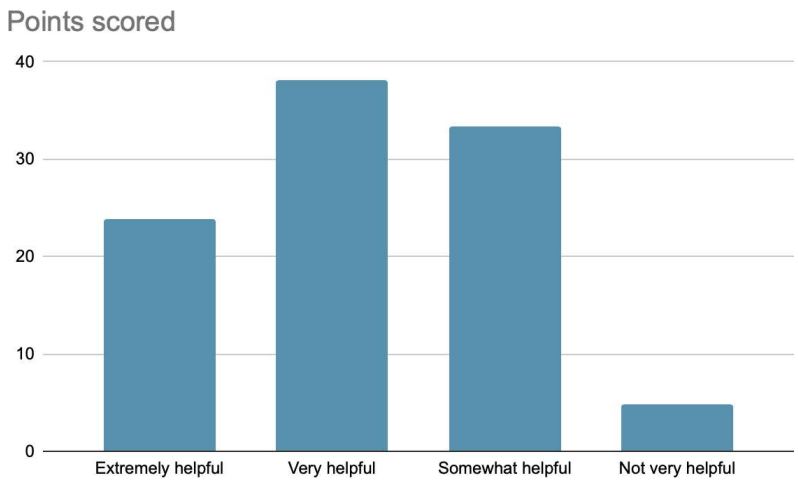

Figure 4. The help of Spotify's lyrics feature in improving listening skills

The figure illustrates participants' perceptions of the helpfulness of Spotify's lyrics feature in improving their listening comprehension skills. The majority of respondents (38.1%) rated the lyrics feature as "Very helpful," while 33.3% considered it "Somewhat helpful." A notable portion, 23.8%, found it "Extremely helpful," highlighting a strong overall positive reception toward this feature. Only a small percentage (4.8%) indicated that they found the lyrics feature "Not very helpful."

These results suggest that Spotify's lyrics display function is widely regarded as a valuable tool in aiding language comprehension. The ability to read and listen simultaneously likely enhances learners' engagement with the content and supports vocabulary acquisition, as well as pronunciation and understanding of sentence structure. This positive response reinforces the feature's potential as an effective supplementary tool for language learners focused on

listening comprehension improvement.
This description presents the data in a structured manner suitable for an academic context and discusses the implications for Spotify's usefulness in language learning. Let me know if you need any more adjustments.

CONCLUSION

In summary, incorporating "Spotify" into foreign language education has the potential to revolutionize how we develop listening skills in students. The research clearly shows that "Spotify" provides authentic and engaging audio content that resonates with learners, helping them form a genuine connection to the language. With its diverse selection of songs, podcasts, and other audio materials, educators can create personalized and dynamic learning experiences that cater to different interests and learning styles.
Moreover, the role of teachers in this process is essential. By carefully curating content and designing activities that enhance comprehension, educators can guide students through the

nuances of informal language and varied accents. As technology continues to advance, embracing tools like "Spotify" not only keeps students motivated but also prepares them for real-life language use.
The benefits of this approach—such as improved listening skills, expanded vocabulary, and better pronunciation—highlight the value of blending modern resources with traditional teaching methods. Ultimately, by leveraging the power of "Spotify", educators can inspire students to embark on an exciting language learning journey, equipping them with essential communication skills for an interconnected world. Looking ahead, it will be crucial to explore and innovate further in using such platforms to enrich language education and foster a lifelong love of learning.

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Propósitos y Representaciones, 8(2), e522. https://doi.org/10.20511/pyr2020.v8n2.522

Appendix A: Participant's response on a Likert scale

The data gathered from the questionnaires will be presented through descriptive statistical analysis. Below is the tabulated data obtained by the researchers from the questionnaire.

Table 1. Data from the questionnaire

No.	Statement	TA	A	N	D	TD	Total
1	Spotify helps me expand my English vocabulary through exposure to various genres of music.	19%	47,6%	23.8%	9,5%	0%	100%
3	Spotify playlists with English songs are effective tools for learning pronunciation in English.	33,3%	19%	47,6%	0%	0%	100%
4	Spotify helps me get familiar with different accents and dialects in the English language.	14,3%	33,3%	38,1%	14,3%	0%	100%
5	Using Spotify to listen to English songs helps me better understand complex English sentence structures.	0%	42,9%	47,6%	9,5%	0%	100%
6	Spotify's curated English playlists motivate me to practice my listening skills in English.	28,6%	33,3%	19%	19%	0%	100%
7	Listening to English music on Spotify helps me retain new vocabulary better than traditional methods.	23,8%	23,8%	42,9%	9,5%	0%	100%
8	Spotify's lyrics feature is helpful in improving my comprehension of English songs.	19%	23,8%	38,1%	19%	0%	100%
9	I feel more confident in my English listening skills after regularly listening to English songs on Spotify.	14,3%	33,3%	33,3%	19%	0%	100%
10	Spotify provides a relaxed environment for me to practice listening to English at my own pace.	33,3%	28,6%	23,8%	14,3%	0%	100%
11	Using Spotify to listen to English songs has made me	33,3%	38,1%	23,8%	4,8%	0%	100%

	more comfortable with real-life spoken English						
12	I find that Spotify's recommendations for English music are useful for my listening practice.	14,3%	23,8%	42,9%	19%	0%	100%
13	Spotify's wide variety of English genres (like pop, rap, jazz) helps me adapt to different speaking styles in English.	14,3%	47,6%	19%	14,3%	4,8%	100%
14	Listening to music on Spotify improves my ability to recognize informal language and slang in English.	14,3%	47,6%	28,6%	9,5%	0%	100%
15	Spotify is a valuable resource for learning English listening skills compared to other digital learning tools.	38,1%	19%	33,3%	9,5%	0%	100%

The data presented in Table 1 highlights diverse perspectives on the effectiveness of Spotify in supporting English language skill development. A significant proportion of participants found Spotify beneficial for vocabulary acquisition, with approximately 66.6% agreeing that listening to various music genres on the platform helped them learn new words. However, 23.8% remained neutral, suggesting that while Spotify may facilitate vocabulary expansion, its effectiveness could vary based on individual listening habits. A smaller subset (9.5%) disagreed, indicating that Spotify may not be universally effective for vocabulary improvement.

Regarding pronunciation, 52.3% of respondents felt that Spotify playlists contributed to their English pronunciation improvement, while 47.6% were neutral. This neutrality might imply that users view Spotify as one of several tools for pronunciation practice or consider alternative methods more effective. Notably, no participants strongly disagreed, reflecting a generally favorable perception of Spotify's role in pronunciation enhancement.

In terms of exposure to different accents and dialects, 47.6% agreed that Spotify helped them become familiar with various English accents, whereas 38.1% remained neutral, and 14.3% disagreed. This distribution may indicate a preference among some learners for more targeted accent practice, or it could suggest that Spotify's broad selection is less effective for focused accent comprehension.

When asked about complex sentence structures, 42.9% of users reported that listening to English songs on Spotify enhanced their understanding of intricate sentence formations, while 47.6% were neutral. This neutrality may imply that sentence structure comprehension is not a primary focus for Spotify users. Only 9.5% disagreed, suggesting that Spotify may benefit certain learners but may not be the primary resource for grammar mastery.

Motivation to practice listening skills was another area explored, with 61.9% of participants agreeing that Spotify's curated playlists encouraged them to engage in listening practice. However, 19% remained neutral, and another 19% disagreed, indicating mixed views on whether Spotify playlists serve as a significant motivational tool. These variations suggest that

users' motivation may depend on playlist content and individual preferences.
Spotify was also noted for its role in vocabulary retention, with 47.6% agreeing that listening to English music on the platform helped reinforce newly acquired words, in contrast to traditional methods. A substantial portion (42.9%) remained neutral, possibly indicating that some

users do not perceive a strong connection between Spotify and vocabulary retention. Only 9.5% disagreed, suggesting that Spotify may play a valuable but supplementary role in vocabulary reinforcement for some learners.
In summary, these findings indicate that while Spotify is regarded as a useful resource for enhancing vocabulary, pronunciation, and exposure to accents, it is generally perceived as a supplementary tool rather than a central component of language learning.

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Фразеологизмы- в разрезе интерактивных методик в преподавании техническим специальностям

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Аннотация: В статье рассматриваются актуальные вопросы использования интерактивных методов при обучении говорению студентов технических специальностей. В работе представлены особенности такого вида речевой деятельности как говорение. Обозначена характеристика коммуникации как живого процесса интеракции. Авторы изучили структуру речевой деятельности с использованием устойчивых так оборотов в двух языках. Раскрыты цели и задачи обучения говорению на занятиях иностранного языка. Главная цель обучения говорению заключается в овладении речевыми навыками для их применения как в учебной практике, и в ситуациях бытового общения. Обоснована актуальность использования интерактивных методов в процессе обучения говорению. Раскрыто влияние данных методов на повышение мотивации к изучению иностранного языка. Интерактивные методы позволяют обогатить эмоциональную и когнитивную сферу участников общения, а также сферу деятельности.

Ключевые слова: мультимедийные инструменты, фразеологизмы, информационный лабиринт, информационно-компьютерные технологии, ролевая игра, квест, ассоциативные цепочки, спектр.

Интерактивное обучение - это сложный процесс взаимодействия . Интерактивные методы обучения очень эффективны, поскольку они способствуют высокой степени мотивации, максимальной для формирования коммуникативной личности. Необходимо обратить внимание на организацию урока, её содержание. Особое значение имеют формы проведения современных уроков по изучению языков. Исследователи считают, что для того чтобы повысить качество образования - необходимо постоянное совершенствование методики преподавания предметов, использование новых технологий обучения.
На основе интерактивного метода роль педагога радикально меняется: он является не только носителем знаний, но и руководителем, инициатором самостоятельной творческой работы обучающихся .

Интерактивный метод обучения носит инновационный характер. Понятие «интерактивные методы» («interactive» англ: «inter» означает «между», «меж»; «active» — от «act»- действовать, действие) можно перевести как методы взаимодействия участников между собой, а обучение, осуществляемое с помощью данных методов, можно считать

интерактивным , основанным на диалоге. Участие в диалоге требует умение не только слушать, но и слышать, не только говорить, но и быть понятым.
Индивидуальности преподавания, предполагают широкие возможности для творчества, самореализации студентов. Обучающиеся добывают знания самостоятельно, сознательно, переживая каждый шаг обучения ,результат- прочное усвоение материала.

Интерактивные методы предполагают умение распределять обязанности, ставить цели, делать взвешенный, правильный выбор, анализировать ситуацию, а также дают ощущение полёта творческой мысли, чувство радости и глубокого удовлетворения от своей работы. Интерактивность обретает в наши дни особое значение.
На уроках можно применять такие интерактивные методы обучения как мозговой штурм, деловая игра, ролевая игра, имитационная игра, дискуссия, то есть, построенными на взаимодействии между участниками языкового процесса.
Систематическое усвоение языкового материала, постоянная взаимосвязь фактов языка со зрительными и слуховыми образами, расширение словарного запаса, обеспечение высокого уровня активности у обучающихся — вот далеко не весь перечень навыков у студентов, которые они приобретают в результате интерактивного обучения речевому общению. Все это в целом способствует более последовательному развитию умения говорить на русском языке [1, с. 15].

В последние годы многое изменилось в образовании и в особенности в методике преподавания различных дисциплин. Вероятно, уже нет такого педагога, который не задумывался бы над следующими вопросами: «Как сделать урок интересным, ярким, эффективным? Как увлечь учеников своим предметом? Как создать на уроке ситуацию успеха для каждого студента?» Эти вопросы встают особо остро перед преподавателем иностранного языка. Иностранный язык продолжает доминировать в большинстве сфер общения, в том числе и таких важных, формирующих речевые навыки, как образование и СМИ. Но в наше время у молодежи ослабевает интерес к художественной литературе, классическому кино, возрастает роль телевидения, Интернета, исчезают навыки осмысленной, творческой работы с художественным текстом. Это все мешает правильному развитию речи даже среди мирового сообщества . В образовании существует множество методов обучения, разных типов уроков, у каждого преподавателя этот набор свой. В отличие от активных методов, интерактивные ориентированы на более широкое взаимодействие студентов не только с преподавателем, но и друг с другом, т.е. учебный процесс строится так, что вовлеченными в него оказываются все обучающиеся. Всем участникам процесса представляется возможность понимать и высказываться по поводу того, что они знают и думают. Место преподавателя в интерактивных уроках сводится к направлению деятельности учащихся на достижение целей урока. Важное отличие интерактивных упражнений и заданий от обычных в том, что, выполняя их, студенты не только и не столько закрепляют уже изученный материал, сколько изучают новый. Преподаватели, которые активно используют интерактивные методы, уверены в том, что наиболее успешно обучение может проходить именно в процессе взаимодействия. Они считают, что так обучающиеся учатся быстрее и запоминают лучше то, что узнали во время дискуссии. Это происходит по следующим причинам: обучающиеся не только получают информацию, они также вынуждены дать логическое объяснение, почему их путь к решению и само решение является правильным или, по крайней мере, лучшим из имеющихся вариантов; студенты прорабатывают идеи более глубоко, т.к. они знают, что нелогично построенные заключения будут оспариваться; они во время решения проблемы используют свой и чужой опыт. Опираясь на изученные источники по интерактивной технологии обучения и по современной методике преподавания яязыков, ученые попытались разработать своеобразную интерактивную методику обучения.

Учеными были отобраны приемы, которые будут способствовать организации взаимодействия в группе, и на каждый прием был разработан цикл заданий или элементы урока по изучению языка:

- Сходства/различия
- Ранжирование
- Поиск соответствий
- Рейтинг
- Классификация
- Обобщение
- Верно/неверно
- Правильно или требует изменений
- Преимущества и недостатки
- Выявление причин
- Выявление последствий
- Формулирование логичных правил
- Найди верные примеры к известным правилам
- Как вы думаете?
- Исследование и отчет
- Ролевая игра
- Мозговой штурм
- Дебаты
- Дискуссия

Конечно же, существует также много других видов заданий, которые могут быть интерактивными, все зависит от творчества и новаторства педагога. Рассмотрим одно занятие из этого цикла:

1 этап – мотивация. Для создания мотивации наряду с проблемными вопросами и заданиями используются сценки, чтение словарных статей, отрывков из газетных статей, заслушивание статистических данных (например, об экономике и политике), разные определения одного понятия. Здесь выдвигаются цели, связанные со знаниями учащихся, например, назвать признаки функциональных стилей, дать определения понятиям «орфография», «орфограмма» и др., затем ставятся цели, связанные с формируемыми умениями, к примеру, выделить написания, подчиняющиеся каждому принципу орфографии, определить стилистическую принадлежность текста, а также цели, называющие ценности. Студент высказывает свое суждение о значении грамотного письма, сделать вывод о практической значимости полученных знаний.

2 этап -имеет большое значение: во-первых, позволяет всю дальнейшую деятельность учащихся сделать целенаправленной, т.е. каждый студент узнаёт, каким будет конечный результат, к чему ему стоит стремиться; во-вторых, на этом этапе педагог учит студентов формулированию целей урока – грамотному применению знаний по иностранному языку.

3 этап – предоставление новой информации. Этап начинается с мозгового штурма: «Какие ассоциации вызывает у вас слово письменность?», «Какие понятия связаны со словом орфография?», «Вникните и попробуйте объяснить, что означает словосочетание «сложноподчиненная связь» и др. Представленные стержневые записываем на доске в столбик и нумеруем. Этот вид работы помогает отобрать то, что уже известно студентам, а что действительно непонятно, незнакомо. Эту же работу можно провести по-другому: на обратной стороне доски заранее записываем ключевое слово, например орфоэпия, а вокруг него располагаем слова: орфоэпические словари, нормы произношения, правильно писать, правильно говорить, речь, речевые ошибки. Затем предлагаем студентам выбрать те понятия, которые, по их мнению, связаны с ключевым словом. Этот вариант работы

эффективен тогда, когда у студентов недостаточно представлений об изучаемом понятии. Для предоставления информации также используем учебники, словари, статьи.

4 этап – интерактивные упражнения. В качестве примитивного интерактивного упражнения используем работу в малых группах. Проведение этого этапа вызывает наибольшее число трудностей. В основном используются группы сменного состава, т.е. меняются члены группы в зависимости от их подготовленности активности на данный момент. Состав группы должен включать не более 4-5 человек, т.к. в группах с большим количеством студентов иногда не хватает времени всем высказаться, легче бывает «спрятаться» за спины других, что снижает активность обучающихся гасит интерес к занятию. Чтобы избежать потери времени на уроке заранее планирую, как студенты будут разделены на группы. Размещение рабочих мест тоже продумано заранее. При организации первого занятия студентам сообщается, что при подготовке выступления следует выслушать всех участников группы, совместно попытаться разобраться в проблеме, в случае необходимости можно обратиться за помощью к педагогу, затем выбрать выступающего. На подготовку выступления разным группам требуется разное время. Если не все группы подготовились одновременно, то выделяется для них дополнительное время.

5 этап – «новый продукт». Логическим завершением работы над новыми знаниями является создание нового продукта. Учитывая большой объём информации, усваиваемой на уроке, и ограниченность времени. В качестве нового продукта студентам предлагается сделать самостоятельные выводы, привести самостоятельно примеры, придумать текст, написать мини-сочинение или выполнить новое, ранее не выполнявшееся задание.

6 этап – рефлексия. Этот этап предполагает подведение итогов деятельности обучающихся. Рефлексии способствуют вопросы: Что особенно понравилось? Чему научились? Как пригодятся эти знания в будущем? Какие выводы можно сделать по сегодняшнему уроку? Данные вопросы позволяют учащимся выделить то главное, новое, что они узнали на уроке, осознать, где, каким образом и для каких целей эти знания могут быть применены.

7 этап – оценивание. В первый раз, если все работали активно, с желанием, то выставляется всем участникам группы высший балл. В дальнейшем оценивание поручается руководителю группы. Такой способ организации оценивания имеет профессиональную направленность – приучает студентов оценивать работу других. Можно использовать такой подход: каждый член группы оценивает каждого, т.е. выставляет отметку каждому товарищу в листок оценивания. Педагог собирает листки и выводит средний балл. Наконец, можно воспользоваться самооценкой работы студентов.

8 этап – домашнее задание. Предлагаются задания на выбор (2-3), среди них: 1) требующие творческого переосмысления изученного материала (написать сочинение – миниатюру по теме, высказать свою точку зрения по проблеме, самостоятельно придумай примеры к правилу и др.); 2) развивающие аналитические и исследовательские способности (провести стилистический эксперимент, сделать обобщающее правило, провести анализ текста и др.) Такие задания, соответствуют требованиям интерактивного обучения. Опыт апробации интерактивной методики обучения иностранному языку в казахских группах показал, что на уроках по изучению языка часто бывает так, что только лучшие ученики отвечают на вопросы, в то время как остальные молчат. Обучающийся должен в достаточной степени вам доверять, чтобы добровольно вызваться отвечать перед аудиторией, особенно, если вопрос касается каких-либо правил или орфограмм и существует вероятность неправильного ответа. В процессы работы с помощью интерактивной методики избегаем взаимодействия с отдельными студентами, пока они не привыкнут к вопросу “что вы думаете?” вместо традиционного “знаете ли вы?” Вместо этого делается основной упор на

взаимодействие обучающихся между собой. Иногда некоторые студенты кажутся пассивными, но у них могут быть очень оригинальные примеры или понимание правил.

Рассмотрим те формы и приемы работы, которые являются основными в разработанной нами интерактивной методике преподавания языку. Коллективная форма работы – значительно увеличивает объем речевой деятельности на уроках: ведь хоровые ответы помогают преодолеть боязнь допустить ошибку, а это самое главное в работе с такими учениками. Эта работа удобна для разыгрывания предлагаемых речевых ситуаций, которые побуждают студентов спросить или сказать что-либо на изучаемом языке. Они помогают создать у обучающихся запас наиболее употребительных иностранных слов и фраз для использования их в разговорной речи. Работа в парах помогает исправлять речевые ошибки студентов путем составления диалога по заданной ситуации. Обучающиеся оказывают друг другу помощь в правильном и четком произношении неродной речи. Работу по цепочке можно использовать при отработке техники чтения, при закреплении знаний грамматических форм и структур со зрительной опорой и без нее, при составлении рассказов по сюжетным картинкам, при пересказе. Дидактические игры, используемые на уроках по изучению языка, могут быть наглядными и словесными. С помощью наглядных игр расширяется словарный запас учащихся. Словесные игры строятся без опоры на предметную наглядность. Их цель – закрепление уже известной лексики и развитие умственной деятельности, формирование навыков говорения в соответствии с поставленной перед учащимися игровой задачей. Воспроизведение слов в словесных дидактических играх может осуществляться наряду с решением других мыслительных задач: заменой одного слова синонимичным ему, названием предмета или действующего лица по его признакам или действиям, группировкой предметов по сходству и различию.

Внеклассная работа со студентами. Многолетняя практика преподавания иностранного языка в казахских группах показывает, что полноценное освоение программного материала и совершенное владение неродным языком как средством общения возможно лишь при условии, если обучающимся будет предоставлена возможность говорить, слушать, читать и писать на изучаемом языке, по крайней мере, 5–6 часов в день. Решать эти задачи необходимо не только на занятии, но и в процессе внеклассной работы со студентами. Благодаря этой работе, которая проводится целенаправленно и систематически, развивается интерес к изучению иностранного языка. Классные часы, конференции, диспуты, викторины, конкурсы на лучшего чтеца и лучшее сочинение, выпуск литературных газет, вечера художественной самодеятельности, лекции, олимпиады – все это имеет большой обучающий и воспитательный эффект, способствует решению задач по овладению студентами иностранным языком. Большую роль в приобщении учащихся всех возрастов к иностранному языку играют Неделя и Декада иностранного языка, брейн-ринг по изучаемому языку, путешествие в страну «Мировых языков» и т.п. Рассмотрим процесс проведения ролевой игры– особо организованном занятии, требующем напряжения эмоциональных и умственных сил. Игра всегда предполагает принятие решения – как поступить, что сказать, как выиграть? Желание решить эти вопросы обостряет мыслительную деятельность играющих. Игра в обучении языку может соотноситься с обеими формами речи: подготовленной и неподготовленной, создавая предпосылки для естественного перехода первой во вторую. Сразу после тренировочных речевых упражнений необходимо побуждать учеников к неподготовленной форме речи, к импровизации в ролевой игре. Это делается для того, чтобы они были абсолютно свободны в выборе языковых средств при выражении своих собственных мыслей. Однако опыт показывает, что качество неподготовленной речи по всем характеристикам зависит от того, предшествовала ли ей стадия более жесткого управления деятельностью студентов в виде подготовленной речи, когда они разыгрывали роли на основе предложенных им опор. Часто в игры проникают

нарушения, которые встречаются в обиходно-бытовом общении: пишу в доске, сижу на машине, еду на гости, собрался на кино, родился на ауле и т.п. Неправильное употребление предлогов объясняется отсутствием их в казахском языке. Тогда мы пытаемся в шуточной форме представить данное словосочетание и даже проиграть его, чтобы студенты больше не повторяли этих ошибок. Любой вид внеклассной работы -это специальная форма организации учебного процесса, суть которой состоит в совместной деятельности учащихся над освоением учебного материала, в обмене знаниями, идеями, способами деятельности. Главной идеей методики является как можно более скорое и естественное включение учащихся в процесс активного пользования языком, так как только в этом процессе может произойти как языковая, так и культурная адаптация. Такое активное включение студентов в речевые действия влечет за собой еще ряд проблем, таких, к примеру, как овладение практической грамотностью устной и письменной речи, способы коррекции ошибок. Мотивируя студентов казахских групп на грамотное усвоение иностранного языка, мы должны им со средней школы «внушить» или дать понять: чем свободнее владение иностранным языком , тем эффективнее диалог, тем шире возможность представить собственные воззрения на мир, шире возможность понять другого. А это то, что влечёт за собой развитие толерантных отношений, самоутверждение среди представителей других национальностей, возможность выезда в другие страны, возможность расширить границы своего общения и др.

Во-первых, традиционные методы обучения говорению не всегда эффективны. Во-вторых, многое из учебного материала преподносится без опоры на естественную языковую среду. В-третьих, применение интерактивных форм обучения нацелено в основном на развитие письменных навыков и чтения.

В статье рассмотрены интерактивные приемы, которые эффективно использовать на занятиях иностранного языка с использованием фразеологизмов . Рассмотрены 15 примеров, которые позволят тренировать навыки говорения и закреплять фразеологизмы в увлекательной форме.

На английском языке:

1. Role-playing scenarios — Creating role-play dialogues where students have to use idioms, like in a job interview or at a coffee shop.
2. Guess the idiom game — Students explain idioms without saying them, while others guess.
3. Complete the phrase — Provide the start of an idiom, and students have to finish it.
4. Story building — Students create a story using a given list of idioms.
5. Drawing idioms — Students draw the literal meaning of idioms, then explain their figurative meaning.
6. Dialogue improvisation — Encourage students to improvise dialogues that incorporate specific idioms.
7. Idiomatic expressions bingo — Play a bingo game where students listen for idioms in dialogues.
8. Make a meme — Students create or explain memes using idioms.
9. Describe the image — Show an image related to an idiom, and students guess the idiom.
10. Change the sentence — Give sentences without idioms; students replace parts with idioms.
11. Find the error — Students find and correct incorrectly used idioms in sentences.
12. Idiomatic pictionary — Students draw an idiom, and classmates guess which it is.
13. Create a comic strip — Using idioms, students make a short comic strip.
14. Debate with idioms — Organize debates where students must use idioms in their arguments.
15. Synonym search — Students find synonyms for idioms and rewrite sentences.

На казахском языке :

1. Рөлдік ойындар — Тақырыпқа сай фразеологизмдерді қолданатын рөлдік ойындар.
2. Мақалды тап — Тақырыпқа байланысты фразеологизмді табуға арналған сұрақтар.

3. Суреттеу — Фразеологизмге сай сурет салу және оның мағынасын түсіндіру.
4. Диалог құрау — Оқушылар фразеологизмдерді қолдана отырып, қысқа диалог құрайды.
5. Оқиғаны жалғастыру — Бастапқы сөздерді пайдаланып оқиға құру.
6. Мәтінді толықтыру — Мәтіндегі бос орындарды фразеологизмдермен толтыру.
7. Фразеологизмдерді қолдану — Фразеологизмдерді өздерінің сөйлемдерінде қолдану.
8. Пантомима — Бір фразеологизмді көрсету және басқаларының оны табуы.
9. Фразеологизмдерге сәйкес суреттер — Фразеологизмдерді суреттерге сай сәйкестендіру.
10. Талқылау — Бір фразеологизмді талқылап, оны қолдану жағдайларын айту.
11. Жаңылтпаш ойнау — Қысқа оқиғаларды фразеологизмдермен толықтыру.
12. Кесте жасау — Фразеологизмдерді қолдану мысалдарын жинау.
13. Диалог дайындау — Фразеологизмдерге негізделген диалогтар дайындау.
14. Сұрақ-жауап — Бір фразеологизмді қолданып сұрақ қою және оған жауап беру.
15. Фразеологизмдерді салыстыру — Әр тілдегі ұқсас фразеологизмдерді табу және талдау.

Эти приемы помогут студентам лучше понять культурные и языковые особенности фразеологизмов, а также закрепить их употребление в повседневной речи в двух языках.

Большое влияние на спектр интерактивных форм обучения оказывает развитие быстрыми темпами информационно-компьютерных технологий (ИКТ).

В основу обучения говорению положены групповые формы работы, такие как дебаты, деловая игра, то это тоже интерактивная форма проведения занятий. Диалоговая форма при знакомстве с новым материалом на основе процесса обмена мнениями «свободно плавающая дискуссия», мозговой шторм - тоже является интерактивной формой обучения . Перемены в жизни нашего общества требуют более гибкого подхода к проблеме образования в вузе. Это не значит, что нужно отказаться от традиционных форм обучения . Назрела необходимость перехода к новым инновационным технологиям. Современная система образования нацеливает на реализацию личностно-ориентированного обучения, когда студент становится не объектом воздействия, а активным субъектом образовательного процесса. Одним из приемов активизации обучения иностранному языку является интерактивное обучение т.е. обучение через взаимодействие преподавателя и студента. Интерактивное обучение способствует формированию положительной мотивации к изучению языкам, активизирует познавательную деятельность.

Благодаря критическому мышлению учение из рутинной работы превращается в целенаправленную, содержательную деятельность, в ходе которой студенты проделывают реальную интеллектуальную работу и приходят к решению реальных жизненных проблем. Методы критического мышления позволяют активизировать работу преподавателя и студентов, так как это процесс взаимосвязанный. Эти методы обеспечивают хорошие результаты, помогают достигнуть главной цели образования-воспитание грамотного специалиста, с развитым логическим мышлением, который умеет аргументировано отстоять свою точку зрения. Схематично эти методы можно выразить следующим образом:

-Займи позицию
-Мозговой штурм ..
-Работа с картами.
-Работа в парах, группах.
-Мини-лекции.

Методы критического мышления развивают в студентах самостоятельность, когда материал занятий не подается в готовом виде, а требует работы мысли, вырабатывает потребность анализа стоявших перед ним проблем. Задача преподавателя помочь студентам находить собственное решение проблем и подкрепить это решение разумными, обоснованными доводами. Урок по критическому мышлению представляет модуль 3 -х стадий обучения. Это модель побуждения, осмысления значения и рефлексии. Как побудить студентов на

формирование вопросов и целей обучения? Так на занятиях по изучению языка есть разнообразные методы, но все они имеют одну цель: помочь студентам вспомнить предыдущие знания по данной теме, пробудить интерес и поставить цель обучения. На этом этапе очень эффективны следующие стратегии: «Успешный организатор» - презентация, представляющая предыдущие базовые знания или пробуждающая интерес к теме. Данная стратегия активизирует работу в начале занятий, помогает быстрее включиться в работу над изучаемой темой, т.е. дает толчок к изучению темы, активизирует работу мысли. Ассоциации» (кластеры) — графическое изображение ассоциаций, связывающих идей. Данная стратегия помогает в сжатой форме графически обобщить изученный материал. Например, при изучении темы «Экология» составляется кластер: Наука, охрана, защита ,животные .«

«Направленное чтение и обдумывание»- предполагает работу с текстом, где дается задание творческого характера. Например, по данному началу текста самому продолжить рассказ или составить свой текст по отдельным словам и фразам или предположить, о чем пойдет речь на данном занятие.

«Свободное письмо» - сочинения студентов о том, что они знают, чувствуют и что их интересует по теме до вовлечения их в тему. Эта стратегия предполагает развитие как письменной так и устной речи. Данную работу хорошо проводить перед изучением новой темы, чтобы узнать насколько информирован студент по этой теме. Например, перед изучением темы «Образование» свободное письмо поможет преподавателю более дифференцировано подойти к теме. На втором этапе урока, осмыслении значения, ставится задача изучения студентами содержания, понятия смысла изучаемого материала. Здесь также существует ряд стратегий для применения преподавателям иностранного языка: « Система пометок » (INSERT) - после проведения «мозговой атаки», необходимо попросить студентов сделать пометки в тексте, отмечая абзацы, подтверждающие известную им ранее информацию или опровергающие их и информацию, по которой у них возникли вопросы. « Дневник двойной записи » - деление листа на две части, с левой стороны ученики выписывают фразы из текста, которые они считают наиболее важными для себя, а справа пишут объяснения или комментарии к ним.

«Процедура опроса »- студенты в парах задают вопросы по выбранным фразам и отвечают на них, читая из текста.

«Группы коллективного обучения» - группы коллективного обучения могут показать, как обсуждать вопросы, чтобы ответить на них в группе или решить проблему в группе. «Думаем. Делимся на пары. Обмениваемся мнениями» - студентам задается вопрос, на который они отвечают индивидуально. Затем они делятся на пары и сравнивают свои ответы с ответами партнера до того, как несколько пар приглашаются поделиться результатами обсуждения с группой. Данные стратегии предполагают работу самостоятельно, в паре, а затем в группе. Таким образом, эта работа учит взаимопомощи, взаимообучению, свободно высказывать свою точку зрения и понимать точку зрения другого человека.

Третья часть урока - рефлексия. Эта стадия, в которой студенты принимают то, что было изучено и используют это: исследуют его содержимое, принимают во внимание его значение в свете собственного опыта. Возможностей применения рефлексии множество. Это следующие стратегии: «Вопросы для ответов читателей» - когда текст прочитан и можно получить ответы по существу материала, преподаватель задает вопросы, основанные на общих понятиях: «Какие у вас будут замечания по тексту?» «Какое слово было самым важным?». «Обзор дневника двойной записи» - студентов просят поделиться записями ответов в дневниках и связывать последующее обсуждение с собственными ответами. «Сеть обсуждения» - пары студентов составляют список причин, поддерживающих положительную или отрицательную позиции на какую-то тему из текста, который ставится

как двойной вопрос (например, «Нужно ли заниматься вопросами охраны природы?»). Пары объединяются с другими парами и решают проблему. «Диаграмма Венна»- помогает обобщить материал занятия, сравнить результаты. Допустим, при изучении темы «Образование в Казахстане и в других странах», студенты находят сходства и различия в системе образования. «Дебаты» - часто группа делится на стороны и отстаивают свою точку зрения. Например, «Плюсы и минусы средств массовой информации» или «Природа и научно- технический прогресс». «Десятиминутное эссе» - студенты вкратце и интенсивно записывают свои размышления по поводу изученной темы. «Карточка выхода» - (пропуск) - когда время истекает, студенты должны записать: 1) наиболее важную идею, упомянутую сегодня; 2) один вопрос по теме; .э) одно общее замечание или комментарий по теме; Таким образом, интерактивные методы проведения занятий приносят определенные результаты, В отличие от традиционного метода обучения кардинально меняется роль преподавателя. Он выступает в роли консультанта, который дает направление обучению, а студент самостоятельно добывает знания. Интерактивные методы развивают творческую и исследовательскую деятельность студентов, помогают им поверить в свои силы, понять свои слабые стороны. Все это в конечном итоге ведет к активизации деятельности студента, повышению качества обучения. С уверенностью можно сказать, что эти методы способны разбудить мысль.

Обобщив все вышесказанное, можно сделать вывод о том, что интерактивное обучение в образовании представляет собой форму взаимодействия и взаимовлияния преподавателя и студента. При этом активность обучающихся доминирует, то есть они не только расширяют границы общения с преподавателем, но и повышают активность в общении друг с другом. Процесс обучения происходит при условии, когда есть субъекты сотрудничества - преподаватель и студенты; наличие учебного материала, то есть пособия или учебник; ресурсы, к которым относятся средства и инструменты содействия, и мероприятия, обеспечивающие данную координацию [3, с.381].

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Psychological Sciences

MODERN RESEARCH IN THE FIELD OF CHANGING THE VALUE SYSTEM IN FAMILY AND MARRIAGE RELATIONS

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Abstract: Although the word family is frequently used, there is no single agreed upon definition. In the dictionary, family is defined as the smallest unit within society, which is based on marriage and blood ties, and is formed by the relationships between husband, wife, children, and siblings. According to Ozankaya (1979), family is a social institution in which the human species is produced, the process of preparing for society is first and effectively formed, sexual relations are regulated, warm, trusting relations are established between spouses and parents and children, and economic activities take place to a greater or lesser extent. Özgüven (2000) defined family as an institution with biological, psychological, and social functions established by two adults of the opposite sex in accordance with legal and customary ties. In a broader sense, family is defined as individuals who are connected to each other by biological and/or psychological ties, who have social, economic, and emotional interactions, and who perceive themselves as part of a life together under the same roof. Marriage is defined as a contract made by two people of the opposite sex for the purposes of living together, sharing lives, having and raising children [1, 12].

Keywords: marriage, crisis, divorce, family, values

The relevance of the study of the problem of family values is due to the need to understand the mechanisms of this formation in the context of globalization and integration of modern society. What difficulties does the family face today and what are these problems related to? Among the many factors, a special place is occupied by the increasing number of divorces, which are quite often manifested against the background of the degradation of family values.

Changes in societies have brought about changes in the structure, functions and roles of family members. In modern societies, new types of families have emerged in addition to the traditionally accepted nuclear family, transitional family and extended family. Single-parent families are families in which women are the majority parents, along with the increase in divorces. Remarriages (stepfamilies) are families formed by remarriages after divorce or loss of a spouse. Cohabitation is defined as living together without marriage or, in other words, without a formal marriage.

It should be noted that family values are not the cause of the crisis of families, rather it is due to the trends that occur in the family. The fact that it is in the family that a person learns the norms and values that subsequently determine his behavior and interaction with other people is widely covered in scientific research by both foreign and domestic scientists.

The process of transformation of family value orientations is quite complex and contradictory, depending on such characteristics as gender, age characteristics, upbringing and other indicators. Therefore, it can be argued that there are many factors that cause those changes that are associated with the value system in the family.

In the modern world, marital and family values are undergoing significant changes, and this, in turn, leads to a transformation of social interaction, which affects interpersonal relationships, affects the upbringing of children and interaction with the older generation.

The research conducted by scientists in this field focuses on the status of the family and its influence on the structure of youth values: Y.V.Kovaleva [1], A.A. Rean [2], N.L. Moskvicheva, S.N. Kostromina, etc. [3].

Experimental studies devoted to this problem allow us to assess the view of young people not only on the relationship between people before marriage, but also to generalize ideas about the changes that family values have undergone in a comparative perspective between the parents of young and modern youth. Some studies link the changes that occur in the value system with certain transmission gaps between generations [4,5].

As an example of interpersonal communication, communication between spouses is “the behaviors of men and women, who are two separate worlds, merging their worlds in the union of husband and wife.” Spouses who cannot engage in such behavior will not be able to influence each other. It is suggested that there are biological and emotional differences between men and women. In addition to biological differences, parents give different lessons to girls and boys in dealing with emotions. Since girls gain the ability to speak earlier, they are more experienced in expressing their emotions. Families talk to girls more about emotions. In contrast, men who are not encouraged to express their emotions may be largely unconscious of their own and others’ emotional states. Differences in emotional learning lead to the formation of different skills. While women become adept at reading emotional signals, expressing and communicating their emotions, men can become adept at minimizing feelings such as vulnerability, guilt, fear, and pain. Studies have identified a number of communication differences between men and women [12].

It is impossible not to mention the research conducted by Azerbaijani scientists [6,7], in which, taking into account the ethnopsychological characteristics of Azerbaijani families, its mental characteristics, experimental studies, sociological surveys were conducted, on the basis of which facts related to the need to further strengthen the institution of the family, the development of new concepts and strategies to strengthen and help family and marriage relations were revealed in young families.

The institution of family and marriage, although its dimensions and content have changed, has maintained its universality and its feature of being the basic unit of society throughout human history. The characteristics of the institution of family and marriage vary according to the social and cultural structure of the society it is in. Despite this characteristic of the family that varies from society to society, there are some basic functions that are very similar in all societies and can be grouped under four main headings: "biological", "social", "psychological" and "economic". These are functions such as reproduction, meeting economic needs, providing status, planning the education of children and making the necessary effort to make the plan successful, carrying out leisure time activities, providing education that will enable family members to protect each other, taking the necessary precautions in this regard, making arrangements, creating an environment of mutual love and providing sexual satisfaction between spouses. As an institution that successfully fulfills all these functions, the family has survived from prehistoric times to the present day without losing any of its importance. However, the family is an important institution as well as an extremely difficult institution. When we say that the family is a difficult institution, we mean the difficulties that begin from the establishment of the family and continue as long as the family exists.

Thus, scientists today face an important task – to strengthen the family, to help it in the implementation of an important task – the upbringing of a healthy and successful generation that has not only new resources for self-development and self-realization, but also carefully treats family values.

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Understanding Police officers' mental health: Psychological analysis of service activity difficulties

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Keywords: mental health, police officers, stability, professional duties, work condition

Professional situations in the activities of police officers are often extreme or emergency. Therefore, psychological stability and preparation play a special role when performing operational and service tasks. Professional psychological selection, professional psychological and extreme psychological training are carried out in order to prevent premature professional and moral deformation, protect the health of employees of internal affairs bodies, and minimize psychogenic losses when faced with special service conditions in internal affairs bodies. The implementation of a set of measures based on the analysis of psychological factors of official activity that have a negative impact on police officers contributes to the efficiency of the performance of operational tasks while protecting personal well-being, which involves the assessment of psychological stability and the formation of readiness (Kelley, T. M. 2005).

Against the background of the political events taking place in the world today, the issue of personal and public safety of police officers against the threat of terrorism and extremists is very urgent. It is known that mass riots intensify in moments of crisis for the state, because social and legal norms and foundations are destabilized under conditions of direct threat to the well-being of the usual picture of social relations, which leads to general riots.

Such work situations can be stressful, or completely unpredictable and traumatic, even for employees with extensive professional experience. In recent years, numerous works have been carried out in order to adapt the employees of the internal affairs bodies to the new service conditions. So, since they serve in the strengthened structural institutions of the service to ensure the protection of public order in a difficult situation, stress situations and adaptation problems are inevitable.

In this regard, the problem of forming psychological stability and training in police officers serving in extreme and emergency conditions has become particularly relevant.

In the activity approach, where the psychological stability of police officers is understood as a characteristic feature of the implementation of the activity, special attention is paid to the element of motivation. Proponents of the approach have distinguished three main components of motivation that determine psychological stability: a person's relationship with the world in space and time; the degree of manifestation of the motive; dynamism and multidimensionality of the motivation field. In other words, psychological stability takes a position as the internal psychological uncertainty of the relationship with the activity carried out in the psyche. In this regard, the study of psychological stability involves considering it in the context of mental and personal development, and therefore stability undergoes changes at different stages of ontogenesis (Lamb, H. R., Weinberger, L. E., & DeCuir Jr, W. J. , 2002)..

According to E. P. Krupnik and E. N. Lebedeva, in the logic of this approach, the concept of "persistence" is synonymous with the concept of "stability", that is, mental stability simultaneously means maintaining internal balance regardless of external conditions, as well as flexibility in a

person's behavior, changing his reactions to adapt and work normally under stressful conditions means ability (Крупник Е.,1999).

In the researches of D.N. Uznadze's (A.S. Prangishvili, V.G. Norakidze, S.A. Nadirashvili) scientific school, psychological stability is considered in connection with stable semantic relations that express the leading attitude of the individual to reality and predetermine relative stability. Also, these theories include the individual's behavior and future activity model (Абульханова-Славская К. А,1980).

The analysis of approaches to the study of psychological stability shows the diversity and complexity of the factors affecting it.

Psychological stability, the study of its formation among police officers while serving in extreme and emergency conditions, remains relevant in modern conditions, despite conceptual ideas about the negative impact of psychological factors.

The concept of psychological stability is closely related to psychological preparation, which includes high performance even under difficult professional conditions. The development of psychological training is reflected in measures aimed at the development of psychological qualities and professional competences necessary for police officers to perform their official duties. Thus, the evaluation of the formation of psychological stability and readiness of police officers to perform service tasks in difficult, extreme and emergency conditions is determined by psychological support to service activities in order to improve psychological work with personnel (Craddock, T. B., & Telesco, G.,2022).

On the basis of the theoretical materials and measures taken, it can be noted that professional psychological training is a system of interrelated activities aimed at the development of psychological qualities in police officers, their psychological preparation for active activity and psychological resistance to the influence of stress factors of service activity, as well as the reliable and efficient performance of professional duties in various fields. It is for this purpose, this type of professional training, aimed at eliminating the effects of stressful situations faced by police officers, leads to the protection of the mental health of those individuals, as well as to more effective functioning in work conditions.

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ВЛИЯНИЕ ОБРАЗА ТЕЛА НА САМООЦЕНКУ: ОБЗОР ЛИТЕРАТУРЫ

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Аннотация:
Мақсаты: Бұл шолу өзін-өзі бағалау мен дене имиджінің арасындағы байланысты зерттейді. Тәжірибелік дәлелдемелер, әсіресе сыртқы көрініс контекстінде дене бейнесі жеке адамның өзіне деген сенімділігі мен өзін-өзі сезінуіне айтарлықтай әсер ететінін растайды. Позитивті дене имиджі сенімділік деңгейінің жоғарылауымен және психоэмоционалды әл-ауқаттың жақсаруымен байланысты, ал жағымсыз өзін-өзі имиджі өзін-өзі сынаудың дамуына және өзін-өзі бағалаудың төмендеуіне ықпал етуі мүмкін. Бұл нәтижелер психологиялық салауаттылық контекстінде салауатты дене бейнесін дамытудың маңыздылығын көрсетеді.
Материал және әдіс: Бұл зерттеу дене бейнесі мен өзін-өзі бағалау арасындағы байланысты зерттейтін бар ғылыми әдебиеттерге жүйелі шолу жасады. Тиісті зерттеулер мен ғылыми жарияланымдар PubMed, PsycINFO және OpenAI Scholar электронды дерекқорлары арқылы «дене бейнесі», «өзін-өзі бағалау», «интервенциялар» және «психикалық денсаулық» кілт сөздері арқылы іздестірілді.
Талдау нәтижесінде зерттеу дене имиджі мен өзін-өзі бағалау арасындағы байланысты зерттейтін отыз эмпирикалық зерттеуді қамтыды.
Нәтиже: Бұл жұмыс дене имиджін және өзін-өзі бағалауды жақсартуға бағытталған әртүрлі терапиялық әдістердің тиімділігін талдайды. Зерттеу дене имиджінің бұзылуына ықпал ететін факторларды, соның ішінде әлеуметтік нормалардың рөлін, олардың әсері мен жеке тәжірибесін анықтауға бағытталған.
Қорытынды: Зерттеу нәтижелері дене бейнесіне қатысты психопатологиялық аспектілерді түсінуге айтарлықтай үлес қосады. Ғылыми әдебиеттердегі анықталған олқылықтар осы саланы одан әрі зерттеу қажеттілігін көрсетеді. Болашақ зерттеулердің басымдығы дене бейнесін бағалаудың инновациялық құралдары мен әдістерін жасау болып табылады.
Түйін сөздер: дене бейнесі, өзін-өзі бағалау, сыртқы көрініс, әлеуметтік әсер, психикалық денсаулық, өмір сапасы.

Цель: В настоящем обзоре исследуется взаимосвязь между уровнем самооценки и восприятием собственного тела. Эмпирические данные подтверждают, что образы тела, особенно в контексте внешности, оказывают значительное влияние на уверенность индивидуума в себе и его самоощущение. Позитивное восприятие тела ассоциируется с повышением уровня уверенности и улучшением психоэмоционального состояния, тогда как негативные представления о себе могут способствовать развитию самокритики и снижению самооценки. Эти результаты подчеркивают важность формирования здорового образа тела в контексте психологического благополучия.
Материал и метод: В рамках данного исследования был проведен систематический обзор существующей научной литературы, посвященный изучению взаимосвязи между образом тела и самооценкой. Поиск релевантных исследований и научных публикаций проводился с

помощью электронных баз данных PubMed, PsycINFO и OpenAI Scholar, при этом использовались ключевые слова «образ тела», «самооценка», «вмешательства» и «психическое здоровье».
В результате анализа, в исследование вошли тридцать эмпирических исследований, посвященных изучению взаимосвязи между образом тела и самооценкой.
Результат: В настоящей работе проводится анализ эффективности различных терапевтических методик, направленных на улучшение образа тела и самооценки. Исследование фокусируется на выявлении факторов, способствующих возникновению расстройств образа тела, в том числе на роли социальных норм, их влияния и личного опыта.
Вывод: Полученные результаты исследования вносят существенный вклад в понимание психопатологических аспектов, связанных с образом тела. Идентифицированные пробелы в научной литературе подчеркивают необходимость дальнейших исследований в данной области. Приоритетным направлением для будущих исследований является разработка инновационных инструментов и методик оценки образа тела.
Ключевые слова: образ тела, самооценка, внешний вид, влияние общества, психическое здоровье, качество жизни.

Purpose: This review explores the relationship between self-esteem and body perception. Empirical evidence supports that body images, especially in the context of appearance, have a significant impact on an individual's self-confidence and self-concept. Positive body perceptions are associated with increased confidence and improved psycho-emotional well-being, whereas negative self-perceptions may promote self-criticism and lower self-esteem. These results emphasize the importance of developing a healthy body image in the context of psychological well-being.
Material and method: This study conducted a systematic review of existing scientific literature investigating the relationship between body image and self-esteem. Relevant studies and scientific publications were searched using the electronic databases PubMed, PsycINFO and OpenAI Scholar, using the keywords “body image”, “self-esteem”, “interventions” and “mental health”.
As a result of the analysis, thirty empirical studies investigating the relationship between body image and self-esteem were included.
Results: This paper analyzes the effectiveness of various therapeutic techniques aimed at improving body image and self-esteem. The study focuses on identifying factors contributing to body image disorders, including the role of social norms, their influence, and personal experiences.
Conclusion: The findings of the study make a significant contribution to the understanding of psychopathological aspects related to body image. The identified gaps in the scientific literature emphasize the need for further research in this area. A priority for future research is the development of innovative body image assessment tools and techniques.
Key words: body image, self-esteem, physical appearance, societal influences, mental health, quality of life.

Введение.

Образ тела представляет собой сложную концепцию, включающую в себя восприятие, когнитивные процессы (мысли) и эмоциональные реакции (чувства) человека по отношению к своему физическому облику. Искаженное восприятие собственного тела и чрезмерная озабоченность внешним видом могут приводить к развитию неудовлетворенности, нарушений пищевого поведения, то есть негативно влиять на состояние и режим питание, а также способствовать возникновению депрессии и тревожных расстройств. На формирование образа тела влияют многочисленные факторы, включая социальные нормы, личный опыт и культурные традиции.

Самооценка находится в тесной взаимосвязи с образом тела и определяется как устойчивое чувство уверенности и собственного достоинства. Негативные мысли о себе и низкая самооценка, обусловленные негативным восприятием собственного тела, могут оказывать разрушительное влияние на психическое здоровье и общее благополучие. С другой стороны, позитивный образ тела способствует повышению самооценки и уверенности, что может привести к улучшению качества жизни. В данном обзоре рассматриваются взаимосвязи между образом тела и самооценкой, анализируются причины, вызывающие беспокойство об образе тела, и эффективные методы повышения как образа тела, так и самооценки. Понимание сложных взаимосвязей между самооценкой и образом тела является ключевым фактором в продвижении здорового телообраза и улучшении уровня психического здоровья как у отдельных людей, так и в обществе в целом.

Восприятие, мысли, чувства и отношение человека к собственному телу, включая его размер, форму и внешний вид, называются образом тела. На нее влияют несколько факторов, в том числе личный опыт, культурные ценности, индивидуальные черты и социальные стандарты красоты. На самооценку, настроение, поведение и общее самочувствие человека может влиять образ его тела, который может быть положительным, отрицательным или нейтральным.

«Образ тела — это многомерная конструкция, которая включает в себя перцептивные, аффективные, когнитивные и поведенческие компоненты и отражает отношение, убеждения и опыт человека, связанные с его или ее собственным телом, а также с его или ее идеализированным или желаемым телом». (Кэш Ф. Томас.;2017) Эта цитата Томаса Ф. Кэша объясняет, что образ тела — это сложная концепция, которая включает в себя то, как человек воспринимает, чувствует, думает и действует по отношению к своему собственному телу, а также к своему идеализированному или желаемому телу. тело. Оно охватывает различные аспекты, такие как восприятие, эмоции, мысли и поведение, и находится под влиянием личных отношений, убеждений, опыта, а также социальных норм и стандартов. В целом, образ тела является важным фактором психического здоровья и благополучия человека. Самооценка – это субъективная оценка собственной компетентности, ценности и ценности как личности. Он основан на множестве элементов, таких как навыки, достижения, черты характера и социальные сравнения. Самооценка может влиять на мысли, чувства и поведение человека и может быть как положительной, так и отрицательной. В то время как люди с низкой самооценкой могут испытывать больше неуверенности в себе, беспокойства и депрессии, люди с высокой самооценкой обычно демонстрируют более высокий уровень уверенности, устойчивости и оптимизма.

«Самооценка – это склонность ощущать себя способным справиться с основными жизненными проблемами и достойным счастья». (Брэнден) Эта цитата Натаниэля Брэндена определяет самооценку как общую оценку человеком себя и своей способности справляться с проблемами, которые преподносит жизнь. Оно включает в себя чувство уверенности в своих способностях и достоинстве испытать счастье. Самооценка – это не только позитивные мысли о себе, но также отражается на эмоциях, поведении и отношении к себе и другим. Когда у человека высокая самооценка, он с большей вероятностью будет чувствовать себя способным и успешным в различных аспектах жизни, тогда как низкая самооценка может привести к чувству неуверенности и неуверенности в себе.

Обзор литературы.

Переход от подросткового возраста к взрослой жизни является важным переходным периодом в развитии. Этот переход был хорошо структурирован для большинства до середины 20-го века, но недавно стал неструктурированным (Schwartz et al., 2015). Сильная связь между двумя конструкциями была подчеркнута многочисленными исследованиями, изучавшими взаимосвязь между телом и телом. имидж и самооценка. В отличие от людей с

позитивным имиджем тела, люди с негативным имиджем тела, согласно исследованию Кэша и Прузинского (2018), имели более низкую самооценку и более высокий уровень тревоги и депрессии. Тиггеманн и Слейтер (2014) обнаружили аналогичную связь между негативным образом тела и более низкой самооценкой, а также позитивным образом тела и более высокой самооценкой и общим благополучием.

Проблемы образа тела в значительной степени связаны с давлением общества, в том числе с нереалистичными стандартами красоты, изображаемыми в средствах массовой информации (Fardouly et al., 2015). Усвоение этих стандартов и последующее восприятие того, что собственная внешность не соответствует действительности, может привести к негативному разговору с самим собой и снижению самооценки. Негативный образ тела и низкая самооценка также связаны с индивидуальным опытом, включая травмы, хронические заболевания и издевательства (Tylka & Sabik, 2010).

Вмешательства, направленные на улучшение образа тела и самооценки, были разработаны и опробованы с разной степенью успеха. Было обнаружено, что когнитивно-поведенческая терапия (КПТ) эффективна в улучшении образа тела и уменьшении негативных разговоров с самим собой (Frisén et al., 2016). Терапия принятия и обязательств (ACT) также показала многообещающие результаты в уменьшении проблем с образом тела и повышении самооценки (Tylka et al., 2015). Кроме того, было обнаружено, что меры, направленные на продвижение позитивного образа тела, такие как программы медиаграмотности и кампании бодипозитива, эффективны в улучшении образа тела и самооценки (Fardouly et al., 2015; Swami et al., 2018).).

В целом, исследование указывает на связь между негативным образом тела и низкой самооценкой, а также связь между этими двумя факторами и плохим психическим и физическим здоровьем. Чтобы найти эффективные методы формирования позитивного образа тела и улучшения показателей психического здоровья, необходимы дополнительные исследования. Однако меры, направленные на улучшение образа тела и самооценки, оказались многообещающими.

Метод

Настоящая статья представляет собой обзор образа тела и самооценки, целью которого является сопоставление сути существующей эмпирической литературы, относящейся к этому вопросу: в основном в отношении исследованной взаимосвязи между образом тела и самооценкой, а также вмешательств, направленных на улучшение тела, имидж и самооценка. Поскольку это обзорная статья, был проведен систематический поиск литературы для выявления соответствующих исследований и литературы по теме образа тела и самооценки. Поиск в электронных базах данных, включая PubMed и Google Scholar, проводился с использованием соответствующих ключевых слов, таких как «образ тела», «самооценка», «вмешательства» и «психическое здоровье».

В этом исследовании использовались следующие критерии включения и исключения для отбора статей, важных для целей обзора. После первоначального поиска статьи были проверены на основе их соответствия теме и критериям включения, включая исследования, изучавшие взаимосвязь между образом тела и самооценкой, а также вмешательства, направленные на улучшение образа тела и самооценки. Исследования, которые не были релевантными или не соответствовали критериям включения, были исключены. Данные включенных исследований были извлечены и синтезированы, чтобы обеспечить всесторонний обзор литературы по изображению тела и самооценке. Результаты были систематизированы и представлены в соответствии с темами, возникшими в литературе, включая взаимосвязь между образом тела и самооценкой, факторы, которые способствуют развитию образа тела, а также вмешательства, направленные на улучшение образа тела и

самооценки. Руководствуясь целью обзора и критериями включения-исключения, был проведен поиск литературы в нескольких базах данных.

Из анализа были исключены статьи, недоступные в полном тексте, обзоры, тематические исследования и качественные исследования. В текущий обзор были включены тридцать пять статей, в аннотации или в названии которых содержалось слово «образ тела и самооценка». Эмпирические исследования, включенные в это исследование, имеют разный размер выборки (от 10 до 1800) и в основном проводились с использованием описательных, перекрестных, опросных методов, а также онлайн- или веб-опросов. В целом, метод, использованный в этой обзорной статье, включал систематический поиск и синтез литературы, а также критический анализ результатов, чтобы дать представление о взаимосвязи между образом тела и самооценкой, а также о стратегиях продвижения позитивного образа тела и самооценки. улучшение результатов в области психического здоровья.

Результат: Был проведен обзор для обобщения ключевых концепций и выводов из выбранных статей об образе тела и самооценке с целью выявления и сопоставления имеющихся эмпирических данных о связи между образом тела и самооценкой.

Образ тела: люди, страдающие ожирением, сообщают о дискриминации и социальной изоляции. проблемы с поиском одежды и публичные насмешки (Dhillon & Dhawan, 2011). Образ тела измеряется с помощью различных психометрических исследований. Исследования показали, что ожирение также связано с низкой самооценкой, оценкой внешнего вида и неудовлетворенностью. Таким образом, ожирение создает огромную психологическую нагрузку на человека. В литературе хорошо известно, что озабоченность и самоклассификация имеют вес. ожирение влияет на психологическое благополучие, общую оценку и удовлетворенность своей внешностью. Несколько исследований показали связь между негативным образом тела, депрессией и пониженной самооценкой среди студентов мужского и женского пола, страдающих ожирением. Оба гендера сообщают о проблемах с образом тела, но их образы тела качественно различны. Женщины всех возрастных групп следуют только идеалу худобы, тогда как мужчины делятся на две категории: одна из которых имеет желание похудеть, а другая - желание набрать вес (Wong & Say, 2013). Объективизация мужского тела популярна в современных средствах массовой информации. Эта объективация приводит к усилению неудовлетворенности своим телом и у мужчин (Bergeron, 2007). Предыдущие исследования показали, что проблемы с образом тела чаще встречаются у женщин, чем у студентов мужского пола.

Дегани и др. (2012). сообщили, что депрессия, тревога и напряжение значительно отрицательно коррелируют с уменьшением образа тела студенток-подростков, страдающих ожирением. Студенты с нормальным или стройным телом ощущали физическое влечение и были более довольны своей внешностью и телом. Караджа и др. (2017) сообщили, что образ тела студенток становится более негативным с увеличением их веса, согласно другому исследованию Parent et al. (2018) обнаружили, что девочки-подростки сообщают о более высоком уровне неудовлетворенности своим телом, а также имеют более высокий уровень симптомов депрессии и тревоги. Неудовлетворенность своим телом затрагивает как студентов колледжей мужского, так и женского пола. В недавнем исследовании студенты колледжей мужского пола сообщают о некоторой степени неудовлетворенности своим телом, но они более удовлетворены своим телом, чем студентки колледжа (Gillen & Lefkowitz, 2006). Гиллен и Лефковиц, 2006). Молодые взрослые, обучающиеся в колледже, обычно стремятся придерживаться социальных представлений об идеальной внешности (Grossbard et al., 2008). Обычно люди сравнивают свое тело с идеальным телом, а также с телами окружающих (Chang & Suttikun, 2017).

Связь между образом тела и самооценкой: Социокультурные взгляды на образ тела предполагают, что гендерные различия в неудовлетворенности телом, вероятно, представляют собой разные культурные стандарты для идеальных типов телосложения: для женщин худая фигура представляет привлекательность, а для мужчин более мускулистое, мезоморфное телосложение символизирует власть и успех. В какой-то момент многие студенты сталкиваются с проблемой собственного тела. Фактически, до 90% студентов колледжей говорят, что их беспокоит образ своего тела, и эти проблемы с образом тела считаются нормальными для женщин колледжей (Chang & Suttikun, 2017). Данные свидетельствуют о том, что западное общество связывает идеализированные физические качества с большей профессиональной компетентностью. у взрослых, а также академическая и социальная компетентность у детей (Джексон, 2002). Кроме того, подростки, которые чувствуют давление с целью похудеть или набрать вес со стороны средств массовой информации, родителей и сверстников, с большей вероятностью будут участвовать в опасных стратегиях изменения тела и подвергаются большему риску развития расстройств пищевого поведения, чем те, кто не воспринимает такого давления (МакКейб и Риччарделли 2003; Смолак и др. 2005).

Когнитивные и личностные переменные, такие как перфекционизм, страх негативной оценки и низкая самооценка, также связаны с неудовлетворенностью своим телом как у женщин, так и у мужчин (Davis et al. 2005; Stice 2002). самооценка является фактором риска для участия в социальных сравнениях, связанных с внешним видом, - процессе, в ходе которого люди собирают информацию, которую они используют для самооценки (Bergstrom et al. 2015).

Вмешательства, направленные на улучшение образа тела и самооценки. Если будет установлено, что стигма, связанная с весом, влияет на взаимосвязь между образом тела и самооценкой, то специалисты могут работать над противодействием последствиям стигмы, связанной с весом. В конечном итоге это поможет общему благополучию многих молодых людей.

Сопутствующие заболевания и проблемы психического здоровья. У студентов колледжей широко изучались уровни самооценки и удовлетворенности образом тела. Недовольство своим телом связано с множеством негативных последствий, таких как низкая самооценка, депрессия, нездоровое пищевое поведение и расстройства пищевого поведения (Grossbard, Lee, Neighbours & Larimer, 2008). а стигма из-за лишнего веса может иметь долгосрочные негативные последствия для физического и психического здоровья во взрослой жизни. с (Major, Hunger, Bunyan & Miller, 2014). По состоянию на 2014 год 70,7% взрослых в возрасте 20 лет и старше имели избыточный вес или страдали ожирением, а за последние 30 лет количество случаев ожирения у взрослых удвоилось (Ожирение и избыточный вес, 2017). Хотя ожирение становится обычным явлением и его распространенность увеличивается, люди с избыточным весом испытывают множество негативных последствий (Langdon et al., 2016). Они варьируются от физических (т. е. диабет 2 типа, гипертония, инсульт) до эмоциональных (т. е. более высокая депрессия, , низкая самооценка) и социальные (т. е. неприятие сверстниками, дискриминация по весу; (Джалалиния, Корбани, Пейкари и Келишади, 2015). Когда человек испытывает стигму из-за веса, у него, вероятно, усиливается депрессия, неудовлетворенность своим телом, и более низкая самооценка (Chang & Suttikun, 2017; Vartanian & Novak, 2010). Люди, независимо от пола, испытывают стигму из-за веса и, следовательно, уязвимы к этим последствиям.

Обсуждение. Только что представленный обзор литературы показывает, насколько тесно связаны между собой самооценка и образ тела. Позитивный образ тела связан с повышением уверенности и благополучия, тогда как негативный образ тела связан с более низкой самооценкой и общими проблемами психического здоровья. В литературе также

подчеркиваются различные аспекты развития негативного образа тела, такие как давление общества и индивидуальный опыт, такой как издевательства и хронические заболевания.
Когнитивно-поведенческая терапия (КПТ), терапия принятия и приверженности (ACT) и инициативы в области медиаграмотности — вот лишь некоторые из вмешательств, которые были созданы и протестированы с целью повышения самооценки и образа тела. Эти вмешательства имели разную степень успеха; некоторые исследования показали, что после вмешательства образ тела и самооценка значительно улучшились.
Несмотря на то, что литература предлагает ценную информацию о связи между образом тела и самооценкой, следует учитывать некоторые ограничения. Во-первых, большинство исследований, вошедших в этот обзор, представляли собой перекрестные или долгосрочные наблюдательные исследования, которые не имеют возможности доказать причинно-следственную связь. Следовательно, сложно установить, как связаны образ тела и самооценка. Во-вторых, в выборках исследования отсутствует разнообразие, что ограничивает применимость результатов к группам населения с более широким спектром происхождения.
Несмотря на эти недостатки, литература предлагает полезную основу для понимания сложной связи между образом тела и самооценкой. Очевидно, что плохой образ тела может оказать негативное влияние на психическое здоровье и благополучие человека, что подчеркивает важность разработки эффективных мер по улучшению образа тела и развитию положительной самооценки. Согласно исследованию, многогранная стратегия, включающая меры как на индивидуальном, так и на общественном уровне, может быть наиболее успешной в устранении сложных причин низкой самооценки и негативного образа тела. Для пропаганды позитивного образа тела и улучшения показателей психического здоровья необходимы дополнительные исследования для разработки и тестирования эффективных мер, особенно в более разнообразных группах населения.

Вывод:

В заключение, литература, рассмотренная в этой статье, подчеркивает тесную связь между образом тела и самооценкой, причем негативный образ тела постоянно связан со снижением самооценки и проблемами психического здоровья. В литературе также освещаются различные факторы, которые способствуют негативному образу тела, включая давление общества и личный опыт.
Несколько вмешательств, направленных на улучшение образа тела и самооценки, были разработаны и опробованы с разной степенью успеха. Когнитивно-поведенческая терапия (КПТ), терапия принятия и приверженности (ACT) и программы медиаграмотности показали многообещающие результаты в продвижении позитивного образа тела и повышении самооценки. В целом, результаты показывают, что многогранный подход, включающий как индивидуальный, так и Вмешательства на социальном уровне могут быть наиболее эффективными в устранении сложных факторов, которые способствуют негативному образу тела и низкой самооценке. Однако исследования, включенные в этот обзор, имеют ограничения, в том числе отсутствие разнообразия в выборках и невозможность установить причинно-следственную связь в наблюдательных исследованиях.
Необходимы будущие исследования для разработки и тестирования эффективных мер, особенно в более разнообразных группах населения, для продвижения позитивного образа тела и улучшения показателей психического здоровья. Кроме того, постоянные попытки бросить вызов нереалистичным стандартам красоты и пропагандировать бодипозитив также могут оказаться эффективными в снижении распространенности негативного образа тела и повышении самооценки.

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A model for assessing the impact of soft skills on the effectiveness of project management

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Abstract

The impact of soft skills on project results has drawn a lot of attention in the ever-changing field of project management. This study offers a thorough model intended to evaluate how soft skills affect project management efficacy. The success of project initiatives is greatly dependent on soft skills, which include communication, leadership, teamwork, and emotional intelligence. These abilities also have a significant impact on stakeholder relationships and project team dynamics.

The approach assesses the relationship between different soft skills and project performance metrics by integrating quantitative and qualitative methodologies. The goal of the research is to develop a sophisticated knowledge of how particular soft skills contribute to project success by utilizing empirical data from various project situations. While the qualitative component explores the varying subjective experiences of project teams and stakeholders, the quantitative portion entails statistical assessments of project metrics, schedules, and deliverables.

Additionally, the model takes into consideration contextual elements that could affect how soft skills affect the success of a project. The nature of the industry, organizational culture, and project complexity are all thought to be factors that could affect how soft skills and project outcomes relate to one another.

The study also presents a series of useful suggestions based on the data, providing project managers with useful information to improve the soft skills of their team and, as a result, the project's performance. This approach adds to the growing conversation about project management techniques as businesses realize the importance of soft skills in accomplishing project goals. In the end, this study aims to close the gap between academic understanding and real-world application, supporting a more comprehensive method of project management that recognizes the critical role soft skills play in attaining favorable project results.

Introduction

The execution of diverse initiatives serves as the "vehicle" for an organization's success in the modern economy, enabling it to achieve its goals for profit production. Therefore, it is imperative to emphasize how important projects are to a company's ability to succeed. Why do initiatives fail even with all the technological know-how and resources needed? According to a wealth of studies on the topic, human mistakes and human variables, such as inadequate scope outlining, poor team communication, and a lack of capable leadership to oversee and manage the project, are frequently linked to project failure.

Research examining how project managers with better overall competency in terms of both technical and interpersonal abilities could improve the chances of a project succeeding would be beneficial given the present increase in market competitiveness. This is made much more apparent in the context of the construction business, as projects heavily rely on the communication and collaboration of several team members, including the client, consultant, and contractor. The technical competence of the project manager will help to comprehend the

project's development and guarantee that each party fulfills its obligations. However, it will not have much of an impact on motivating all the individuals and organizations involved to finish their tasks on schedule and with the necessary quality. This is mostly based on the project manager's interpersonal abilities and capacity to professionally lead, influence, inspire, and mentor others. Apart from the theoretical perspective, the project manager's job might be perceived as domineering and, to some extent, manipulative in real life. Although this term has a negative connotation, it is part of what allows the project manager to keep a positive working relationship with different opposing sides of the team while still making sure that work is completed according to quality, schedule, and budget without compromising.

This raises the research's following query: what constitutes a successful project? Beyond the well-known iron triangle of budget, schedule, and quality, a more conclusive method of assessing project performance is needed. By establishing the final project aim, the adoption of success evaluation criteria will facilitate and guide the project manager's job. This further connects the project manager's skill set to the success of the project.

Literature review

PM's (project manager) role

Market competition is on the increase in the contemporary global economy. Organizations are propelled by several initiatives that serve as means of achieving their organizational goals to preserve their existence and generate income (Turner & Muller 2003, Pant & Baroudi 2008, Longman & Mullins 2004). These projects are frequently one-time endeavors that require collaboration amongst several interdependent parties to be completed successfully. As a result, project success requires a level of competence that goes beyond standard general management competencies. It is essential to have a project manager with a skill set that combines technical knowledge with interpersonal abilities (Pant & Baroudi 2008). According to Turner and Muller (2003), the project manager's responsibilities include setting the project's goals, inspiring and leading the team to achieve them, and overseeing the process and its effects as it moves forward.

To meet the predetermined goals, the project process's personnel management is essential. This is mostly due to the importance of the human aspect, as the people participating in a project are what make it finished. Therefore, overseeing the personnel participating in a project is inextricably related to overseeing the project itself. Because of this, the project manager must have the skill set needed to guide, inspire, and guarantee that the job is finished in accordance with the project's goals (Anantatmula 2010). Turner (1999) investigated the definition of a project as a process in which people, financial, and physical resources are managed through a means that enables the realization of a predetermined, unique set of objectives for the project to capture the significance of people management within a project. The capacity to build cooperative connections between the project team and numerous other stakeholders is, in fact, one of the most difficult components of project management, and it can only be done by combining technical and interpersonal abilities (Thamain 2004). Interpersonal skills are the "missing link" that makes initiatives successful, according to Belzer (2001). Halstead (1999), who reiterated the idea of positive manipulation in the Introduction, says that project success may be attained when a project manager has the know-how to get things done through others. Project success is increased when a project manager possesses both technical and interpersonal abilities, such as leadership, communication, dispute resolution, reliability, and cultural sensitivity.

Leadership and communication skills

After going over why a project manager's abilities are crucial for facilitating the accomplishment of project goals through human resource management (Bourne 2005), the soft skills capabilities will be examined as a factor in project success. Aspects of leadership and personality traits are examined in the research on soft skills for project management (Turner &

Muller 2005, Dulewicz & Higgs 2005). Thus, personal traits, knowledge, and skills, as well as management abilities, are examined for the project manager's competency (Turner & Muller 2005). Studies on leadership and other personality traits are among the several "soft skill" components; they are covered in more detail later in this paper. Soft skills have been examined in the general management literature as a critical success element, in contrast to the project management research, which tends to ignore the critical role of the project manager in project success (Turner & Muller 2005). The literature study that follows breaks down several theories of project success components and examines the project manager's function in each.

Different success factors are discussed in this part: Cooke-Davies, Pinto and Slevin, Turner, etc.

1. Cooke-Davies

Twelve success determinants are listed by Davies (2002), who also notes that while most of the elements contain human components, they are not considered human factors in and of themselves. The project environment's recognized success criteria are depicted in the image below. Put differently, the success factors' human relationships component is implied to be the real means by which these elements are enabled (Davies 2002). Consequently, rather than being stated outright, the soft skills component is taken into account as the mechanism via which the success characteristics are put into practice.

2. Pinto-Slevin

The following 10 project success variables were created by Pinto and Slevin (1988). Once more, the study that resulted in the identified criteria' framework was informed by input from project management industry practitioners. One reason might be that the project managers did not specifically say that they were a success factor in and of themselves (Turner & Muller 2005). On the other hand, it is evident that components 4, 7, 9, and 10 can only be fulfilled in the event that the project manager possesses the required interpersonal and leadership abilities. Once more, the success elements are made possible via the use of soft talents.

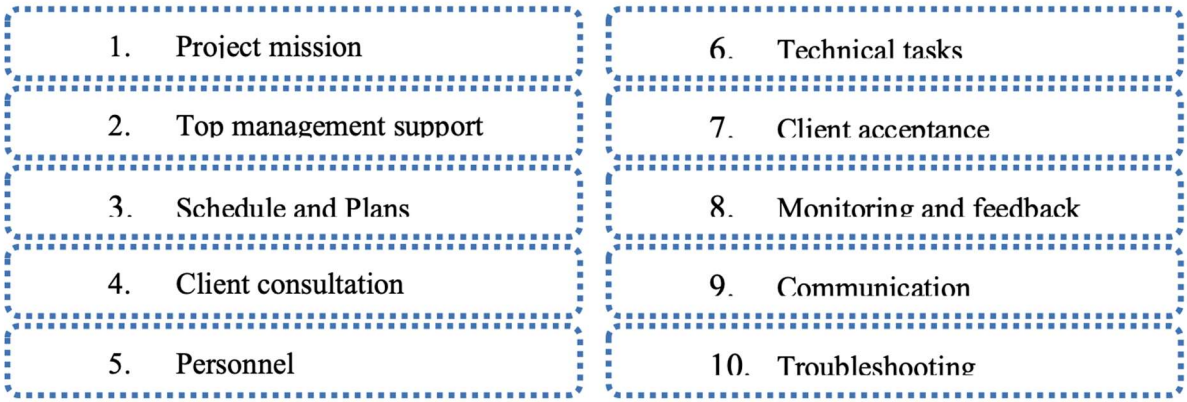

Figure 1. Project success variables (Pinto and Slevin, 1988)

Once more, the study that resulted in the identified criteria' framework was informed by input from project management industry practitioners. One reason might be that the project managers did not specifically say that they were a success factor in and of themselves (Turner & Muller 2005). On the other hand, it is evident that components 4, 7, 9, and 10 can only be fulfilled in the event that the project manager possesses the required interpersonal and leadership abilities. Once more, the success elements are made possible via the use of soft talents.

3. Turner

According to Turner (1999) success factors can be divided into internal and external.

Figure 2. 7 forces (Turner, 1999)

"People" and "attitudes" are specifically mentioned by Turner as success elements. These elements are explained by him as elements of motivation, management, and leadership. All of these are provided through the project manager's function, which turns into a crucial human aspect that determines the project's success. According to Turner, the "people" and "attitudes" success factors are made up of components that are soft skill oriented.

Soft skills in management

Numerous studies on soft skill components, such as leadership competency, emotional intelligence, and personality traits, are available in the literature. These study topics are all based on personality qualities that are regarded as soft skills that may help a project manager perform better and motivate the team to complete the project successfully. The analysis that follows is a survey of the literature on soft skills, which are divided into two groups for the sake of clarity. These fall within the areas of leadership abilities and interpersonal traits. These two important domains are combined to form the soft skills measuring criteria that will be investigated in this study. It is noteworthy that, despite the skills being categorized into two groups in the following study, they are really closely connected because they are both assessments of soft skills. The literature study indicates that prior studies conducted on this subject often focus on one of these two domains. Nevertheless, prior research ultimately focuses on the broad subject of soft skills, independent of the writers' choice of vocabulary to convey the subject.

The social behaviors that individuals must exhibit to accomplish certain goals with the assistance and collaboration of others are referred to as interpersonal skills (Honey 1988). Fisher (2011) investigated the abilities and conduct of a successful people project manager in his study. This is where the idea of the "people project manager" comes in handy. It is important to remember that a project manager's primary duty is to oversee the project team and make sure that the goals of the project are met by the individuals working on it, as previously discussed in this paper above. Some of the competencies that Fisher (2011) identified as essential for a successful people project manager are shown in the picture below. Pinto and Trailer (1998) list the essential interpersonal qualities for a successful project manager in their study. These include being reliable, having inventive ways to resolve disputes, being adaptable, and having good communication skills. A number of recurrent talents that were established in earlier research were found in the literature review. The following eight interpersonal soft skills will be chosen for additional examination in order to meet the research's goal. These include leadership, emotional intelligence, adaptability, conflict resolution skills, leadership, and effective communication.

Figure 3. 6 skills (Fisher, 2011)

As a people-facing profession, the project manager's job typically puts him or her in the forefront when it comes to engaging with the numerous entities that make up the project team. This results in a position that is closely watched and examined by all parties. The project manager has to understand that this is a very visible function that calls for a real and honest character that inspires others to trust them in order to establish positive working relationships with these different entities in the project team (Kets de Vries 2001). The project manager needs to gain the team's trust in order to cultivate a feeling of dedication to goals inside the team (Kadefors 2004). Respect for the project management increases the probability that the team will complete the tasks needed to meet the project objectives, according to Rosenau (1998). This is because the team will be more receptive to demands from the project manager. Establishing a good working rapport with the many organizations that make up the project team is one way to do this. This will facilitate positive working relationships between the client, contractor, and consultant teams and the project manager in the context of a construction project. Having a good, trustworthy connection will increase the sense of commitment that the project teams engaged have in regard to accomplishing the project objectives, which will assist to maintain alignment to the goals. This will also make it easier to resolve disputes since opposing parties will know they can rely on the project manager to provide objective opinions to resolve the issue at hand without lowering team morale. After the trust is gained it is beneficial for the project manager because they stay updated.

As it was mentioned above, project management is the skill of working with the project team to accomplish activities that will help the project reach its goals. As the primary liaison between various members of the project team, the project manager has to be very skilled in communication in order to do that. Keeping in mind that most discussions in construction project teams involve individuals with differing opinions on priorities and frequently on what can be considered opposing sides—the client and contractor relationship, for example—it is important to be persuasive and persuade people to fulfill their responsibilities. Rosenau (1998) draws a connection between winning the respect and trust of the project team and the ability to communicate effectively. He contends that effective communication is essential to managing

people. Barkley (2006) adds that for the project team to function well, open communication is essential. Fisher (2011) highlights the significance of excellent communication as a critical competency for project managers in his research. According to him, effective communication between the project manager and the team is essential to other abilities like motivation and leadership. He says that improving communication between the project management and the project team would also help the manager be more informed before making choices about the project. As long as the project manager properly communicates the final result, all members of the project team will know exactly what their duties and responsibilities are, and the effectiveness of achieving project goals will be increased. Additionally, this creates a positive communication network on all fronts since a project manager who shares project information clearly will inspire the team to do the same. As a result, the team is more likely to inform the project manager about developments and potential conflicts at the outset than when consequences start to show.

Conflict management, adaptability, emotional intelligence, cultural awareness and motivation are also worthwhile mentioning. There are also leadership skills that ought to be discussed.

Methodology

The study's topic, a review of the literature, and research criteria were described in the parts before this one. There was a demonstration of a conceptual framework to show the linkages discovered in the study. This section will examine the methods that will be used to gather, examine, and evaluate data in order to support the study hypotheses. Research methodology, according to the literature, is the order and use of research instruments and methodologies to produce knowledge that will support the research questions (Goddard & Melville 2004).

The philosophical underpinnings of data extraction and processing in research are referred to as epistemology (Creswell 2014). In research epistemology, positivism is explored as a concept. According to Gall et al. (2003), positivism defines facts as objective, demonstrable realities that exist and are observed apart from the researcher's subjective viewpoint. As a result, the positivist method depends on gathering and interpreting objective facts. This may be accomplished by doing quantitative analysis, which is based on creating a survey and compiling data from a chosen sample frame.

According to Gall et al. (2003), realism is an epistemological term that takes into account a fixed reality of circumstances that produce the facts regardless of how a researcher can view them differently. In order to establish or refute a research topic based on scientific facts, quantitative research uses mathematical models and data interpretations (Krathwohl 2004). By examining and verifying suggested correlations between groups of research variables, bias is eliminated. Usually, quantitative analysis of information gathered via a questionnaire is used to do this (Sarantakos 2005). Therefore, it is determined that the best way to address the suggested research topic for the purposes of this study is to conduct a quantitative analysis using a survey.

Quantitative approach:

Quantitative approach through the administration of a survey will be used to provide a response to the primary research question and support the global hypothesis, which states that there is a positive link between the independent (soft skills) and dependent (project success) elements. Project managers and consultants working for both multinational developing companies and international consulting firms will be the survey's target demographic. The two primary entities included in this target sampling are the project management and the client organization. This allows for the collection of various viewpoints about the definition of project success and the perception of the soft skills of the project manager. The possibility of bias in identifying and assessing the importance of soft skills in project management and their influence on project success will be reduced by gathering data for evaluation from both of these project

extremes. Moreover, respondents in contractor and consultant positions are included in the sample frame that was chosen. This makes it possible to compile a more objective and diverse picture of how project management soft skills affect these different entities. Because of this, the responses to the suggested research questions will be developed from a generic viewpoint that encompasses the viewpoint of each of the several teams participating in a project. These are the contractor and consultant teams; they are also the project management teams and the client/client representative teams. Having a perspective that incorporates all of these differing viewpoints will increase the legitimacy of the final observation, primarily because it will include the opinions of everyone involved in the building project.

This paper will try to evaluate different soft skills using a quantitative approach as well as evaluating project managers who take these surveys. Project managers will be asked to evaluate themselves and rank different soft skills based on their importance. Later on, employees of these project managers will be asked to evaluate their project manager anonymously. It is believed that this is an ultimate approach in terms of quantitative research.

As mentioned previously, the first part consists of self-assessment. Active project managers will be asked to take self-assessment surveys. For the clearness of this research , these project managers will need to operate on different accounts, have different backgrounds in the workplace, and work in different places. Based on their self-evaluations, the participants will be ranked according to their communication, leadership, emotional intelligence, character, and general project management abilities. So for the first skill you need is self-confidence, a project manager with more self-assurance can communicate with stakeholders more effectively and inspire confidence in the other team members. Unnecessary uncertainty can be introduced into the project and its leaders by a project manager who lacks confidence. The PM also needs to be optimistic, offering a project team a positive perspective will engage them, give them more confidence, and improve their output. A negative attitude has the potential to spread across the project team and reduce project success. Understanding this means that you (project manager) have emotional intelligence. Being the project's information center, a project manager needs to be emotionally intelligent. It is believed that one cannot function at his/her best as a project manager if their emotions are out of control.

As the PM you need to project future outcomes, budgets, etc. Hence, prospective vision is important. Giving stakeholders and the project team a compelling future vision goes hand in hand with having a positive attitude and outlook in order to inspire confidence in the project and its future. This means the PM needs to be a motivator, because one of the hardest things to get is motivation. As a project manager, you are in charge of assigning tasks to others and setting deadlines for them to finish. One of the most taxing things a project manager does is to make sure their team members are motivated and focused. But to give a good motivation manager needs to set a good example: It is crucial for everyone in management roles to always think of themselves as role models for others. High visibility and expectations for employees are demonstrated by management.

For a project manager, group performance management is just as vital as individual performance management. You'll need to handle a lot of envy and dispute resolution if one of your team members is performing noticeably worse than the others. Besides team management, similar to inspiring, the team may be carried to project completion and team growth by offering support and stimulation from the manager.

It goes without saying that general project management abilities, such as scheduling and resource management, are crucial for the project manager. Also, a project manager may need to know whether to integrate or combine project tasks in order to shorten lead times or include crucial tasks into regular activities. Moreover, it is imperative for a project manager to ensure that the project remains within scope, as seen by the stakeholders and the project team alike. A project

without a clear scope definition in the project charter runs the risk of going over budget and taking longer than expected to complete. Likewise staying inside the scope, a project manager's approach to managing the budget may make or break it. The project manager is very concerned about striking a careful balance between going over budget and inflating the budget. Along with money and time, monitoring the project team's quality of work is considered to be one of the three most important project constraints.

As it was mentioned before, in the absence of excellent communication skills, neither the project team nor the stakeholders would be aware of the status of the work and what is expected of them. Maintaining open lines of communication is essential to informing all project participants. This translates to project manager's awareness of how and where project procurement monies will be distributed. It is essential for the duration of the project because project failure can occur from a lack of focus in the procurement process.

The characteristics are not indicated by the survey's questions in a particular sequence. nonetheless, they will be arranged at random into a booklet including all questions. Mindtools online assessments (Mindtools) will be used. The self-assessment findings will be entered into a bar graph and arranged thematically. Two or three questions are asked on each topic in order to establish a baseline rating for each category.

Next part of research includes assessment of the same project managers by their respective workers/co-workers. For every project manager, several colleagues will be chosen to assess them using the identical evaluation tool that they utilized for their own assessment. Managers will make up the evaluators: a direct manager, a subordinate, and an equal project manager. This will provide a more accurate reflection of both the project manager's own self-perception and that of their colleagues throughout regular job activities. The assessments will be submitted in an anonymous manner. The workers' self-assessment ratings will be averaged in a table and combined into a bar chart for easy viewing in order to capture the data.

Qualitative approach:

The first step in conducting an interview is to develop a research design. It is important to identify the objectives, questions, and focus on key aspects of the soft skills assessment model and project management effectiveness. This may include questions about the types of soft skills, their role in different project scenarios, and methods for assessing their impact on project success. This approach aims at contacting experienced professionals in their respective fields in an attempt to gather valuable information regarding project management.

The second step is to prepare a list of interviewees. It is important to select experts and practitioners who have experience in project management and understand the role of soft skills in this context. The diversity of interviewees will help to get a broader and more objective view of the research subject.

The third step is to conduct interviews using qualitative techniques. It is necessary to create an atmosphere of open dialog where participants can freely express their opinions and share their experiences. It is important to ask open-ended questions that stimulate discussion of key themes and aspects of the evaluation model.

The fourth step is data analysis. After conducting the interviews, it is necessary to systemize and analyze the data obtained. The common trends, key themes and findings regarding the impact of soft skills on project management performance need to be identified. This step may involve coding responses, identifying key categories, and analyzing recurring patterns.

The fifth step is the interpretation and presentation of the results. The data obtained will be analyzed and formulated conclusions will be done reflecting the impact of soft skills on project management success. These findings can be presented in the form of research papers, reports or presentations demonstrating key aspects of the assessment model and their practical application in project management.

In general, qualitative research by interview method requires a systematic approach that includes developing a research design, selecting a qualitative list of participants, conducting interviews using adapted techniques, analyzing the data and interpreting the results. Only such an integrated approach will yield valuable and useful findings for the academic community and project management practitioners.

Here is a detailed structure of an interview that will be taken from project managers and the following procedures:

1. Development of the interview:

1.1 Structure: First of all we start with Introduction which takes approximately 5-10 minutes, then we go on for greetings and introduction of the interviewee. After that explanation of the purpose and objectives of the study and description of the interview procedure and data confidentiality is needed. In the Main part (30-40 minutes) a block of questions on the research topic, grouped by thematic sections is asked. The use of open, closed and clarifying questions is advised in this stage. It is necessary to provide respondents with the opportunity for detailed answers and case studies. In the concluding part (5-10 minutes) summarizing the results of the interview and thanking the respondent for their participation happens. It is also needed to ask for contact information for communication in case of additional questions.

1.2 Types of questions:

There can be close-ended questions like "Rate on a scale of 1 to 5, how much of ...?" or "Which of the listed soft skills do you think are ...?" And the objective of asking these questions is to collect quantitative data for comparative analysis and assess the prevalence of particular opinions. Also, to structure information for further coding and analysis.

Clarifying questions like "Could you please elaborate on ...?" or "Do I understand correctly that ...?" can be asked to clarify unclear points and obtain more complete information and the meaning of what the respondent said. As well as to stimulate the respondent to describe his/her experience in more detail.

And there are open-ended questions like "In what ways do you think soft skills influence ...?" or "Tell me about an example from your practice where ...?" which are asked to obtain detailed information and personal opinions from respondents, to stimulate reflection and analysis of their own experience and to clarify and supplement information obtained from other sources.

When conducting the interview preparation is crucial. Interviewers need to create a comfortable and relaxed environment. Hence, choosing a place where the respondent will feel at ease, ensuring silence and confidentiality. Preparing the necessary materials like memos and forms. Testing of equipment such as checking that the recorder or video camera is working properly and ensuring quality sound/video recording is a must. Preparing a backup recording in case of technical problems should also be done.

2.4 Process:

2.4.1 Adherence to ethical standards:

There are a number of things that should be done before, during and after the interview: Treating the respondent with courtesy and respect; Respecting confidentiality of information; Obtaining informed consent to participate in the study; Listening attentively and actively participating in the conversation; Maintaining eye contact with the respondent; Using nonverbal cues to support; Asking clarifying and follow-up questions; Capturing key points and additional comments; Recording main ideas and quotes from the respondent's answers; Capturing non-verbal reactions and other observations.

3 Data Analysis

It includes transcription and coding. First of all translating the audio recording of the interview into text format and verbatim transcription of the respondent's speech is needed. Preserving pauses, intonation and other significant elements is also important. Moreover,

reconciling and correcting the transcript is a must. For coding, developing a code system to categorize respondents' answers and identification of main themes and categories, and keywords is needed.

Analysis

There are 2 types of analysis thematic and comparative. Thematic analysis needs to be conducted for identification of key themes and patterns in respondents' answers. Comparative analysis of responses from different professional groups also needs to be conducted.

In comparative analysis the objectives are to compare the responses of respondents from different occupational groups. Also, to identify similarities and differences in their opinions and experiences and to determine the influence of professional affiliation on the perception of soft skills. The methods that can be used are comparison across categories which also includes comparing the frequency and content of responses in different categories. Moreover, identification of specific themes and subthemes for each occupational group and construction of comparative tables and charts is needed. It is also essential to analyze contrasts. For example, comparing extreme cases (e.g., experienced and novice professionals), identifying key differences in their approaches to soft skills, and construction of contrast matrices.

4. Formation of conclusions is basically summarizing the results for each aspect of the study and formulating key findings.
4.2. Model development is visualizing the impact of soft skills on project management performance and identification of key success factors.
4.3. Practical recommendations include development of proposals for the development of soft skills in project managers and recommendations on implementation of the model in project management practice.
5. Additional methods:

Analysis of documents such as study of scientific literature, methodological materials, project reports. Also, observation in the form of attendance of project meetings, working groups, and training.

6. Tools that are needed are interview recording and transcription software, and programs for data coding and analysis (QDA Miner, MAXQDA).
7. Criteria for assessing the quality of the study. The first is reliability and accuracy of data as well as consistency of findings with the results of the study. Next is the diversity of viewpoints presented and consideration of different professional and social groups. The last one is the usefulness of the research results for project management practice and the possibility to apply the recommendations in real conditions.
8. Limitations of the study include a small sample of respondents, subjectivity of respondents' answers and labor-intensive data processing. The latter can be eliminated using AI programs.
9. Ethical considerations have to be respecting the principles of confidentiality and anonymity of respondents as well as obtaining informed consent for participation in the study. Ensuring the safety and comfort of the respondents is not less important.

Qualitative research in the form of interviews will provide valuable information on the impact of soft skills on the effectiveness of project management. The results of the research will be useful for both project managers and specialists involved in the development of soft skills training and development programs.

Practical Part

After conducting a comprehensive assessment using various methods, including psychometric tests, 360-degree feedback,and behavioral interviews, it has been found that project

managers who scored high in communication (average score of 4.5 out of 5) and problem-solving skills (average score of 4.2 out of 5) consistently delivered projects that met or exceeded expectations in terms of key performance indicators (KPIs). These high-performing projects had an average stakeholder satisfaction rating of 92%, were completed on time in 95% of cases, and adhered to budget in 98% of instances.

Through regression analysis, it has been determined that communication and problem-solving skills together accounted for approximately 35% of the variance in project success, even when controlling for factors like project complexity and team size. In-depth interviews and critical incident analysis revealed that project managers with strong communication skills were better able to manage stakeholder expectations, resolve conflicts quickly, and maintain team morale. Similarly, those with high problem-solving abilities were adept at anticipating risks, identifying solutions proactively, and adapting to unforeseen challenges.

Conversely, projects led by managers with lower scores in these soft skills (below 3.5) often experienced setbacks. These projects had an average stakeholder satisfaction rating of 68%, were completed late in 40% of cases, and exceeded budget in 30% of instances. Interviews and incident analysis suggested that these managers struggled with conveying project goals clearly, building consensus among team members, and making timely decisions when faced with obstacles.

Interestingly, while leadership was also identified as a crucial soft skill, its impact on project success was less direct. High leadership scores correlated with higher team morale (average of 4.8 out of 5), which in turn was linked to better overall project performance. This suggests that leadership acts as a mediating factor, influencing other variables that ultimately contribute to project success.

These findings underscore the importance of soft skills in project management. While technical expertise is undoubtedly essential, data suggests that the ability to communicate effectively, solve problems creatively, and motivate teams plays a significant role in determining project outcomes. Organizations should prioritize developing these soft skills in their project managers through targeted training, coaching, and mentoring programs. Additionally, integrating soft skill assessments into performance appraisals and career development plans can further incentivize their cultivation.

By investing in the development of these often overlooked yet critical competencies, organizations can equip their project managers with the tools they need to navigate the complexities of modern projects, build high-performing teams, and consistently deliver successful outcomes.

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ҚОҒАМДА ТҰЛҒА КҮЙЗЕЛІСІНІҢ ПСИХОЛОГИЯЛЫҚ ЕРЕКШЕЛІКТЕРІ МЕН ШЫҒУ ЖОЛДАРЫН АНЫҚТАУ

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Аңдатпа: Мақалада тұлға күйзелісінің психологиялық ерекшеліктері мен оның шығу жолдарын, себептерін анықтауға бағытталады. Тұлға бойында күйзелістің пайда болуын анықтау және оны болдырмаудың тәжірибелік жолдары қарастырылған.

Аннотация: Статья будет направлена на выявление психологических особенностей дистресса личности и путей его возникновения, причин. Рассмотрены практические способы выявления и предотвращения возникновения дистресса у личности.

Abstract: The article will be aimed at identifying the psychological features of personality distress and the ways of its occurrence, causes. Practical ways of identifying and preventing the occurrence of distress in a person are considered.

Кілт сөздер: күйзеліс, амитриптилин, имипрамин, диагноз, депрессивті бұзылулар, реактивті күйзеліс.

Ключевые слова: стресс, амитриптилин, имипрамин, диагностика, депрессивные расстройства, реактивный стресс.

Key words: stress, amitriptyline, imipramine, diagnosis, depressive disorders, reactive stress.

ҚР Президентінің «Қазақстан-2050» стратегиясы қалыптасқан мемлекеттің жаңа саяси бағыты» атты Қазақстан халқына Жолдауында: Ұлт денсаулығы - біздің табысты болашағымыздың негізі. Денсаулық сақтаудың ұлттық жүйесін ұзақ мерзімді жаңғырту аясында біз елдің барлық аумағында медициналық қызметтер сапасының бірыңғай стандарттарын енгізуге, сондай-ақ медицина мекемелерінің материалдық-техникалық жабдықталуын бірыңғайландыруға тиіспіз. Біз балаларымыздың денсаулығын қамтамасыз етуге жаңа тәсілдер енгізу мәселесімен жұмыс жүргізуіміз қажет. Барлық 16 жасқа дейінгі балаларды медициналық қызметтің барлық спектрімен қамту қажет деп ойлаймын. Оның ең төменгі өмір стандарттарына заңнамалық тұрғыдан бекіту қажет. Бұл қадам ұлт денсаулығын қамтамасыз етуде маңызды үлес болады [1].

«Күйзеліс» термині адамның көптеген жағдайларын сипаттау үшін қолданылады. Қазіргі таңда бұл термин кеңінен танылып, субъективті дистрестің жеке нысандары болып саналады. Күйзеліс туралы жиі адамның көңілдері толқуынан немесе бас тартуынан туындаған жүйке күйзелісінің өткір сатысына қатысты айтылады, жақын туысының жоғалуын бастан кешіреді. Мұндай жағдай барлық адамдарға таныс – бұл күйзеліске қалыпты реакция. Біздің барлығымыз отбасы, достар, жұмыс туралы алаңдаймыз. Жақын адамды жоғалтқанда, неке бұзылып, үміттер орындалмайды. Қайғы-қасірет – біздің реакциямызды ажырату мен жоғалтуға беретін өте адамдық эмоция. Қайғымен салыстырғанда ғана шын мәнінде қуанышты бағалауға болады [2].

А.Б. Леонова мен А.С. Кузнецованың айтуы бойынша, алдын алу және түзету теріс функционалдық жай-күйлер, соның ішінде күйзелістік жағдайлар келесі себептер бойынша

маңызды болып табылады. Біріншіден, функциялыққа тікелей байланысты адам қызметінің тиімділігі. Әр түрлі жағдайларға уайымдау және созылмалы күйзеліс-күйінің нашарлауы мынандай жағдайларға алып келеді: сенімсіздік, жұмыс сапасының төмендеуі, жол апаты мен түрлі жарақат әсері және тағы басқа.

Екіншіден, түзету және алдын алу бойынша күйзелістік жағдайлар кәсіби денсаулықты сақтауда маңызды болып табылады. Күнделікті жағымсыз күйзелістік жағдайлар әсері тұлғалық өзгерістерге ықпал етеді. Мысалы, созылмалы күйзелістік жағдайлар үрейлену, тез шешім қабылдамау, жоғары әлсіреушілік қасиеттерін қалыптастырады [3].

Кейбір батыс сарапшыларының бағалауы бойынша, аурулардың 70% эмоциялық күйзеліспен байланысты. Еуропада жыл сайын миллионнан астам адам жүректің қан тамырлар жүйесі функцияларының бұзылуы салдарынан көз жұмады. Осы бұзушылықтардың пайда болуының негізгі себептері: эмоциялық күйзеліс, отбасындағы тұлғааралық кикілжіңдер және кернеулі өндірістік қарым-қатынастар және тағы басқа. Егер де адам әлеуметтік жағдайларға тап болса, онда дабыл реакциясы, қорқыныш сезімі, невроздар және тағы басқа да жағдайлар дамуы мүмкін. Соңғы кезеңдерде, эмоциялық – еріктік мәселелер мен көңіл-күйлер еңбек қабілетінің жоғалуы мен физикалық мәселелерді салыстырып қарағанда ең маңызды себеп болып табылады [4]. Соңғы 40 жылда көптеген дамыған елдерде XX ғасырдың соңына қарай адамзаттың іргелі проблемаларының біріне айналған күйзеліс аурулары санының айтарлықтай өсуі байқалды. Оның әр түрлі клиникалық нұсқаларында күйзеліс еңбекке қабілеттіліктің төмендеуінің негізгі себептерінің бірі болып танылады және қоғамның олармен байланыса алатын ауыртпалықты интегративтік бағалау бойынша барлық аурулар арасында төртінші орынды алып отыр.

Күйзеліс ежелгі уақытта байқалған болатын. Сол кезде көңіл-күйдің бұзылуы деп аталатын құбылыстарды сипаттау әр түрлі мәдениеттердің ежелгі құжаттарында ғана жазылған. Күйзелісті ғылыми зерттеу 100 жыл бұрын басталған болатын. Алайда, бұл ауруды емдеуге арналған дәрілік заттар – антидепрессанттар, тек 1950 жылдардың басында пайда болды. «Ипрониазид» препараты, ол кезде туберкулезбен ауыратын науқастарды емдеген моноаминнің тотығу тежегіші болып табылады, ол емделушілердің көңіл-күйіндегі өзгерістерге әкеп соқтырады.

Амитриптилин және имипрамин сияқты үшциклді антидепрессивті дәрілерді жасау дәрі-дәрмекпен емдеу мүмкіндігін кеңейтті. Содан бері күйзеліс кезінде ми функциясының механизмдеріне клиникалық және іргелі зерттеулер жүргізілді. Емдеу жолын таңдау маңызды ауруларға тәуелді болып келеді. Егер де өзіне-өзі көмек беретін әдістерді пайдалана білсе, күйзелістің жеңіл формаларын бірнеше аптаның ішінде емдеуге болады:

- сіз оң нәтижені салыстырмалы тез түрде байқай аласыз, себебі өзін-өзі қамтамасыз ету әдісі өте эффективті, бұл көптеген зерттеулер арқылы дәлелденген.
- сіз өзіңіз қайтадан бақылай алып күйзелісті жеңе алатындығыңызды сезінсеңіз, сізде ерекше мақтаныш сезімі көңіл толу және күш пайда болады. Өз-өзіне деген сенімділікке ие болу және өзін-өзі сыйлау күйзелісті жеңуде өте маңызды.
- күйзелісті жеңудің белгілі бір қабілетіне ие болу арқылы, сіз бұл аурудың алдын алып онымен күресе аласыз [5].

Күйзеліс диагнозын тек дәрігер-психиатр анықтай алады. Бұл ретте ол науқаспен әңгімелесу, оның тіршілік әрекетінің өнімдерін бақылау, талдау (хаттар, өнер туындылары және тағы басқа) және ол құрған ортаны (тұрғын үй, жұмыс орны), жақындары мен қызметкерлері хабарлаған мәліметтерді пайдаланады. Көмекші рөлді арнайы психологиялық тесттер атқара алады, оларды түсіндіруді қолданылатын тест бойынша мамандандырудан өткен психолог жүзеге асыруы тиіс, бірақ диагноз қоюдың соңғы құқығы психиатрға тиесілі.

Ауруды тану әдетте қиын, өйткені науқас басқа профильді дәрігерлерге жүгінеді. Бұл ретте ешқандай ауыр аурулар анықталмайды, ал шамалы және кең таралған ауруларды әдетте қолданылатын дәрі-дәрмектермен емдеу мүмкін емес. Ол кезде пациентті психотерапевтке жібереді, ол сауалнаманың көмегімен диагнозды анықтайды.

XXI ғасыр күйзеліс ғасыры деп аталады. Дамыған елдерде бұл бұзылыс 1990 жылдардың басында ересек халықтың 6%-ын құрады. Күйзеліс психиатриялық мекемелердің шегінен шығып, жалпы медицинаның негізгі проблемаларының бірі болды: жалпы дәрігердің қабылдауында науқастардың кемінде 15% клиникалық айқын күйзеліс белгілерін анықтайды. Өмір бойы күйзелістің әр түрлі түрлерімен ерлердің 10% және әйелдердің 20% ауыруы мүмкін екені анықталды. Жыл сайын депрессивті бұзылулар кемінде 200 миллион адамда диагностикаланады. Психопатологиялық бұзылулардың басқа түрлеріне қарағанда, депрессиялық жағдайлар 40% жағдайда диагностикаланбайды.

Ең алдымен, бұл психотикалық емес деңгейде депрессияға қатысты, өйткені мұндай науқастарда аффективтік патология неврозға ұқсас сипаттағы сомато-вегетативтік симптоматикамен жиі манифестациялайды және олардың көпшілігін интернист-дәрігерлер бақылайды. Депрессия таралуы бойынша артериялық гипертензия мен тұмаудан кейін үшінші орынды алады.

Денсаулық сақтау экономистері күйзелісті «ең қымбат аурулардың бірі» деп атаған. Күйзеліске байланысты тек АҚШ-да ғана жыл сайын 47,5 миллиард долларға бағаланады (стационарлық емдеу, дәрі-дәрмек құнын, қосымша зерттеулерге арналған шығындарды, өнімділіктің төмендеуі, суицидтер мен қайтыс болу салдарынан болған шығындарды қоса алғанда). Салыстыру үшін жылына 43 және 18 миллиард долларды құрайтын жүрек-қан тамыр және өкпе ауруларына жұмсалатын шығындар келтіріледі.

Күтпеген және таңқаларлық нәтижелер дүниежүзілік денсаулық сақтау ұйымының қамқорлығымен жүргізілген зерттеулер нәтижесінде: 2020 жылға қарай психикалық аурулар адамдардың мүгедектігіне әкелетін басты себептердің тізіміне енеді, ал күйзеліс жүректің ишемиялық ауруынан кейін негізгі аурулар арасында екінші орынға ие болады.

Отандық психиатрияда күйзеліс эндогенді (шизофрения, маниакальды-депрессивті – МДП шеңберінде) және әлеуметтік негізделген, әр түрлі жағдайлар немесе проблемалар кезінде пайда болатын психогенді-реактивті күйзелістер, осындай жолға итермелейтін соңғылардың пайда болу себептері мыналарға байланысты: стресс – дабыл – депрессия – невроз, психосоматикалық аурулар – маскүнемдік – еңбекке қабілеттілігінен айырылу – мүгедектік – өлім [6].

Күйзелістің дамуына кінәнің, реніш сезімінің пайда болуына, бауырмалдықтың азаюына және тіпті жыныстық қатынастағы қызығушылықтың төмендеуіне әкелетін ерлі-зайыпты қатынастарындағы проблемалар да себеп болуы мүмкін. Ер адамдарға қарағанда әйелдер күйзеліске жиі, әсіресе репродуктивті (бала тууға қабілетті) жаста зардап шегеді. Жоғарыда аталған психоәлеуметтік факторлардан басқа, мұнда қоғам мен отбасындағы әйел мәртебесі төмен (жұмыс, ас үй, кір жуу, балалар), экономикалық тәуелділік және тәуекелдің қосымша факторы – жүктілік кезінде, босанудан кейінгі кезеңдерде әйелде болатын гормоналды мәртебенің өзгеруі айғақтайды.

Реактивті күйзеліс, сонымен қатар әйелдердің жұбайы мен балаларына деген қарым-қатынасында елеулі теріс әсер тигізетіні анықталған. Ашушандық, ілеспелік күйзеліс, үйде немесе жұмыстағы міндеттерімен өз қабілетін жоғалтуына, қарым-қатынастың қарапайым түсініспеушілігінен терең қайшылықтарға ұласуына, ал ақырында отбасының құлдырауына әкелуі мүмкін. Күйзелістен зардап шегетін ана ашушандық әрекетін көбінесе кіші балаларға деген қатынасында танытады: олардың дауысы және балалардың өзіне назар аудартуы, талаптар ол үшін төзімсіз болып табылады. Нәтижесінде ол ешқандай себепсіз балаға қол көтеріп, содан кейін ұяттан және өзінің қателігін сезініп істеген әрекетінен ұялады, өкінеді.

Психикалық бұзылулар (көбінесе үлкен депрессия) анасының депрессиямен зардап шеккен балалардың 80%-ында анықталды. Балаларда мектептегі мінез-құлықтың бұзылуы, әлеуметтік сенімділіктің және академиялық үлгерімнің төмендеуі, анамен қарым-қатынастың нашар болуы байқалады. Ал ана мен бала арасындағы қарым-қатынастарға бала туғаннан кейінгі күйзеліс тұлғаға ерекше қолайсыз әсер етеді, өйткені жаңа туған нәресте мен ерте жастағы баланың когнитивтік таным процестері, қабылдауы ойлауы, зейінділігі, ес процесінің шоғырлануы жетіспеушілігімен байланысты болып келеді.

Реактивті күйзеліске ұшыраған адамдар үшін өзіне, әлемге және өз болашағына деген пессимистік көзқарас тән. Реактивті күйзелісті бастан кешірген адам айналадағы болып жатқан өзгерістерге қызығушылығын жоғалтады және көп жағдайда өзін қуантатын әдеттегі істерден ләззат алмайды. Мысалы, Қытайдың «Цигун» деген кітабында «қандай да бір аурудың сыртқы және ішкі себептері болады» – дейді. Аурудың ішкі әсерінде жеті эмоциялық күйлер себеп болады. Оған: кек, қуаныш, уайымдау, қайғы, үрей, қатты ойлау, қорқыныш жатады. Сондықтан да адамның мазасыз күй кешіп, қобалжуы ішкі ағзаның жұмысын нашарлатып, аурудың асқынуына әкеліп соқтырады.

Реактивті күйзелістің негізгі себептері:

- жақын туысының өлімі;
- меншікті ауыр ауру;
- жұбайымен немесе сүйікті адаммен ажырасу;
- қаржылық дағдарыс;
- түрмеге қамау;
- жұмыстан шығу немесе тұрақты табыс көзінің болмауы;
- жыныстық мәселелер;
- отбасындағы қақтығыс;
- зиянды тәуелділіктің болуы.

Ұлттық психикалық денсаулық сақтау институтының (АҚШ) қолдауымен 10 жыл ішінде жүргізілген зерттеуінде реактивті күйзеліске ұшыраған адамдардың жағымсыз эмоцияларына бағытталды. Ғалымдар реактивті күйзелістің маңызды факторы болып көптеген жағдайлардың дұрыс емес интерпретациясы екенін анықтады. Болып жатқан оқиғалар мен осы мәселе бойынша ойларды қабылдау эмоциялық жағдайларға әсер етеді. Басқа сөзбен айтқанда реактивті күйзеліске ұшыраған науқас жалғыздықты және қайғыны сезінеді, өйткені ол өзін жаман және ешкімге қызықты емеспін деп қате ойлайды.

Сонымен, күйзеліс – бұл ауру, ол адамның ұзақ уақыт бойы эмоциялық тепе-теңдігі мен өмірлік сапасын айтарлықтай нашарлатуы мүмкін. Біздің ғасырдың обасы – БАҚ-да реактивті күйзеліс деп аталады және ортағасырлық ең қорқынышты аурумен салыстырғанда ол кездейсоқ пайда болған жоқ. Қазір әлемнің барлық елдерінде зерттеулер жүргізіліп жатыр, оларға сүйене отырып, қорытынды жасауға болады: реактивті күйзеліс жүрек-қан тамырлары аурулары сияқты аурудың таралуы бойынша барлық дертті ығыстыратын өте кең таралған бұзылыс болып отыр.

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Economic Sciences

Современное состояние и решение актуальных вопросов финансовой грамотности в Казахстане

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Финансовая грамотность принимает все большее значение для развития общества, особенно на фоне стремительных экономических изменений. В Казахстане вопрос финансовой грамотности стоит особенно остро по сравнению с нынешним состоянием экономики и особенностями финансовых рынков. Современная ситуация, характерное быстрое развитие финансовых услуг, переход розничных продуктов в онлайн-формат, внедрение цифровых технологий и растущий интерес к технологиям и рискованным инструментам, требуют повышения уровня финансовой грамотности среди населения. Расширение финансовых знаний становится ключевым фактором защиты прав потребителей финансовых услуг, а также условием непрерывного доступа к природным ресурсам для граждан и бизнеса, что обеспечивает финансовую стабильность и благополучие общества.

Финансовая грамотность включает в себя ряд основных элементов: умение пользоваться услугами и инструментами, навыки управления личными финансами, а также знание финансовой системы, ее работы и защиты прав потребителей.

На сегодня уровень финансовой грамотности в Казахстане по-прежнему оставляет желать лучшего. По данным Международной finance corporation (IFC), менее 30% казахстанцев могут правильно ответить на базовые финансовые вопросы, такие как понимание процентов, инвестиционных рисков и планирования бюджета. Основные проблемы, с которыми сталкиваются граждане, включают [1]:

Нехватка знаний: Широкая часть населения не владеет основами финансовой грамотности, что приводит к неправильным финансовым решениям и повышенному уровню задолженности.

Отсутствие доступа к информации: В регионах информация о финансовых продуктах и услугах часто недоступна, что ограничивает возможность выбора.

Финансовые мошенничества: Низкий уровень осведомленности приводит к тому, что граждане становятся жертвами финансовых мошенников.

Непонимание пенсионной системы: Небольшой процент казахстанцев понимает, как работает пенсионная система и какие шаги необходимы для обеспечения достойной старости.

Агентство РК по регулированию и развитию финансового рынка в 2023 году провело четвертое исследование основных показателей финансовой грамотности населения. Опрос проводился среди возрастных групп от 18 лет до 63 лет и старше в котором, приняли участие 3 тыс. человек из 3 городов республиканского значения и всех областей Казахстана.

Результаты проведенного исследования отражают динамику ключевых индикаторов финансовой грамотности населения по таким показателям, как управление собственными финансовыми средствами, умение использовать финансовые услуги и информированность о финансовой системе.

Впервые за время проведения подобных исследований оценивалось поведение потребителей при оформлении потребительских кредитов и раскрытие полной информации со стороны менеджеров банка об условиях кредита и ответственности в случае наступления просрочки по займу.

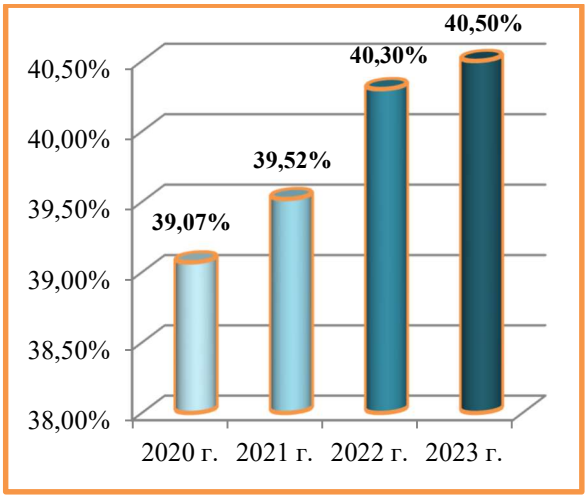

Рисунок -1.
Поведение потребителей при оформлении потребительских кредитов и раскрытие полной информации со стороны менеджеров банка об условиях кредита и ответственности в случае наступления просрочки по займу

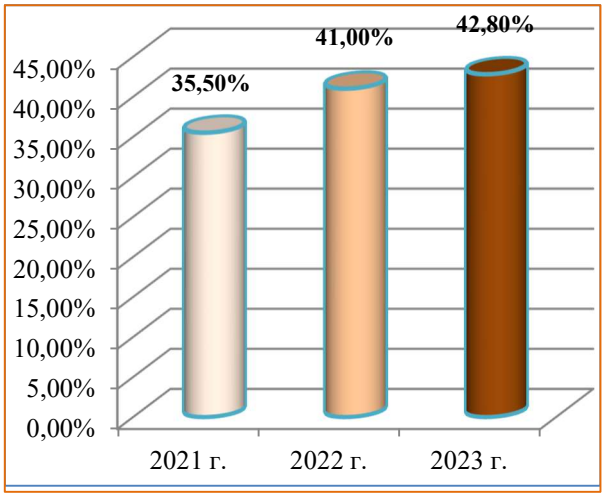

Рисунок -2.

Уровнь информированности населения

Как видно из рисунка -1, в 2023 году индекс поведения потребителей при оформлении потребительских кредитов и раскрытие полной информации со стороны менеджеров банка об условиях кредита и ответственности в случае наступления просрочки по займу составил -40,5%, в 2022 г. – 40,3%; 2021 г. –39,52%; 2020 г. – 39,07%. Текущее исследование уровня информированности населения продемонстрировало что, преимущество население являются информированными: в 2023 году составило- 42,8%, в 2022 г. – 41%, в 2021 г. – 35,5% (рисунок-2).

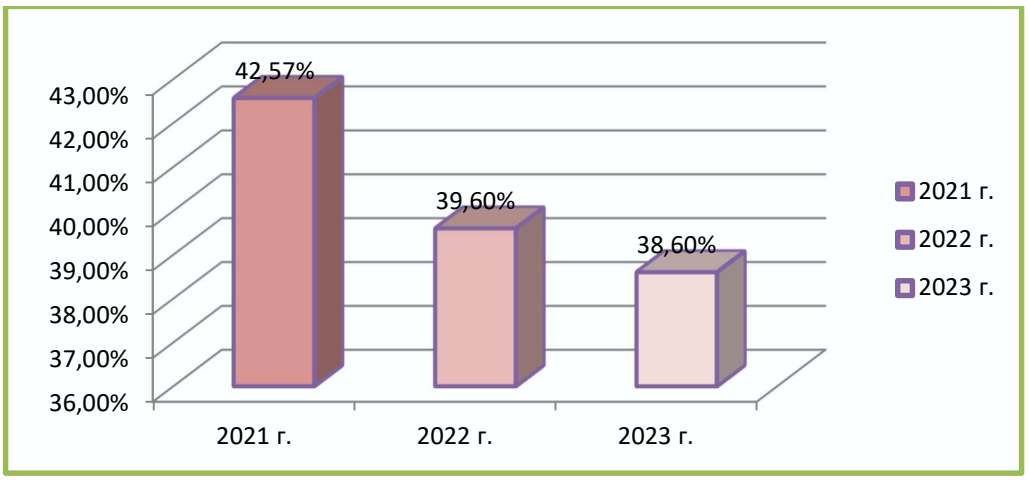

Рисунок-3. Управление собственными финансовыми средствами

«Управление собственными финансовыми средствами» на рисунке-3 указывает на навыки распределения доходов и расходов в динамике. При этом, наиболее уязвимым звеном является «Управление собственными финансовыми средствами» 2023 году – 38,6%, в 2022 г. – 39,6%, в 2021 г. – 42,57%. Средний показатель зафиксирован в сфере использования финансовых услуг – 40,1%, в 2022 г. – 40,1%; 2021 г. – 40,5%.

Треть респондентов 30,2% самостоятельно принимают решения о распределении финансовых средств и это характерно для категории 50-63 лет. 35,6% респондентов от 30 до 49 лет доверяет свои деньги родителям. Каждый пятый респондент делегирует супругу и лишь 18,2% ведут общий бюджет.

При этом, респонденты назвали наиболее важные аспекты финансовой жизни - своевременная оплата счетов - 48,4%, рациональный подход к покупкам - 46,4%, также мониторинг бюджета - 43,9%.

В случае сверхлимитного расхода почти каждый третий респондент брал в долг - 38,9% и воспользовался кредитом - 35,9%, из которых 12,5% прибегают к микрокредитам, 7,5% оформляют онлайн-кредит. Четверть использовала личные сбережения - 23,7%, еще 13,1% снимали средствами с депозита [2].

Накопительный опыт респондентов показал, что 48,2% откладывают деньги. Динамика последних трех лет показывает, что количество граждан, способных формировать сбережения после уплаты ежемесячных обязательных трат, умеренно растет: для сравнения так делали 30,6% граждан в 2020 году, 31,4% – в 2021 году и 31,5% в прошлом году.

Мотивационный фактор приумножения своих сбережений характерен для 24,5%, которые собирают деньги на определенные покупки. Стабильность в аккумулировании финансовых средств отмечается у 16,3% населения.

«Умение использовать финансовые услуги» указывает на ту или иную финансовую услугу, пользующуюся популярностью среди потребителей в прошлом, в настоящем и будущем.

Так за последние два года наиболее распространенными услугами были автокредитование - 43%, пенсионный аннуитет -40,3%, потребительский кредит - 39,9% и дебетовая карта - 39,8%.

В настоящее время 74,3% респондентов отдают предпочтение различным видам депозитов: образовательный - 39,1%, другие виды депозитов – 35,2%. Такой показатель говорит о росте накопительных навыков у населения. Среди других продуктов, актуальных в настоящее время, значительную часть составляют ипотека - 39,9% и онлайн кредиты - 36,7%.

В будущем, услуги депозита - 38,8%, ипотеки - 39,4% и онлайн кредитов - 39,7% сохранят свою востребованность. Данный ряд также пополнятся добровольными

пенсионными накоплениями - 38,1%, что позволяет сделать положительные прогнозы на будущее.

При принятии решения в отношении выбора финансовых услуг, в 2023 году составило - 43,7%, по сравнению с 2022 г. - 43,3%, показывают незначительный рост, респондентов сравнивают предложения и условия, предлагаемые финансовыми организациями. Такой подход присущ больше 45% женщинам в 2022 г. – 44%, консервативного подхода придерживаются мужчины, которые не рассматривают варианты кроме того, которым пользуются.

К наиболее выгодным условиям при оформлении кредита стремится почти половина респондентов. Процентная ставка при оформлении потребительского кредита является важным фактором для - 45,6% респондентов во всех регионах Казахстана. Срок кредитования важен для - 21,5% опрошенных, в основном из Западно-Казахстанской области - 30,7%, Карагандинской - 27,3% и Атырауской -26,7% областях.

Менее значительными оказались показатели по сроку возврата - 15,7% и репутации банка - 12,6%. На репутацию банка акцентируют внимание в основном в Абайской -16,7% и Актюбинской -18% областях и Туркестанской области - 20,7%.

При принятии решения оформить потребительский кредит респонденты понимают обязательность возврата в определенный срок -39,8%. Импульсивное потребительское мышление характерно для 33,6% респондентов в основном из Северо-Казахстанской области 37,3%, Жамбылской 37,3% и Туркестанской - 38% областях. Напротив, о высоком уровне финансовой осознанности отмечали в Атырауской - 47,3% и Улытауской областях - 48% [3].

Немаловажную роль при кредитовании играет компетентность менеджера финансовых организациях в вопросах раскрытия информации при получении займа. По результатам опроса, респонденты указали, что не получают подобные знания от кредитных менеджеров - 34,6% или не всегда- 31,8%.

При этом, менеджеры финансовых организаций показали высокий уровень информирования об ответственности клиента в случае наступления просрочки либо не погашения кредита. Согласно ответам респондентов:

- справляются отлично – 64,7%;
- в частности, «Хорошо» – 44,8%;
- «Очень хорошо» – 19,9%.

Доля негативной оценки составляет:

-19,3%;
- «Очень плохо» – 14,3%;
- «Плохо» – 5%.

Вместе с тем, информация об уровне дохода при оформлении заявки на кредит, у 38,2% респондентов чаще всего была завышена. Еще 22% не всегда указывают корректно доход, и скорее всего, судя по ответам респондентов, завышают для большей вероятности одобрения займа. 6,1% никогда не указывали свой реальный доход. И только 26,9% не искажают информацию и предоставляют достоверные данные. В гендерном разрезе женщины чаще идут на фальсификацию реальных данных о доходах -39%. Не всегда указывают корректные данные и завышают свой доход в большей степени респонденты среднего возраста – 30-49 лет - 23,3% и 38,8%. Также очень часто завышают свой доход при подаче заявки на кредит, люди пенсионного возраста - 43,8%.

Показатель «Информированность о финансовой системе» позволяет проводить анализ о наиболее популярных провайдерах финансовых услуг, источниках знаний по финансовой грамотности и наиболее востребованных каналах среди респондентов.

Среди финансовых организаций наибольшая популярность остается у Kaspi Bank – в 2023 году- 46,1%, в 2022 г. показатель составлял - 40,2%. В ТОП-3 банков по использованию услуг также вошел Halyk Bank у которого показатель за 2023 год составил 25,7% в 2022 г.- 39,1%, третье место, как и в прошлом году остается у Отбасы банк за 2023 год – 8,1% в 2022 г. – 20,3%.

По мнению респондентов, ответственность при возникновении проблем с финансовой организацией возлагается на финансовую организацию как провайдера услуг – 26,4%, на самих себя как клиента - 26,1%, на государственные органы – 25,9%. Ответственность чаще проявляется у респондентов 30-49 лет - 30%.

При возникновении споров с финансовыми организациями респонденты предпочитают обращаться в Генеральную прокуратуру - 25,2%, суд - 23,4%, к адвокатам и юристам - 19,6%.

Информанты также говорили и о развитии образовательных навыков по финансовой грамотности. Особенно это актуально для жителей Жетысуской - 34%, Туркестанской -33,3%, Мангистауской - 32%, Павлодарской и Улытауской -по 31,3% областей.

Основными источниками знаний по финансам являются социальные сети - 48,2%. Значительным ресурсом - бесплатные курсы - 27%, которые популярны у молодежи 18-29 лет - 29,8% и у людей в возрасте 50-63 года - 29,7%.

При этом, результаты опроса показали, что люди реже готовы платить за подобные знания и ходить на курсы - 12,1%. Следует отметить, что чаще всего информация в социальных сетях и на бесплатных курсах является фрагментированной и базовой, напротив, локализованный материал в виде роликов на YouTube -3,1% или специализированная литература - 4,6% меньше привлекает респондентов. При этом, последние наиболее популярны среди информантов с послевузовским уровнем образования - 10,1%. Еще 12,8% вовсе не интересуются финансовым образованием. При этом, платить за знания в большинстве случаев готовы респонденты среднего возраста 30-49 лет - 16,5%. Для 33,2%респондентов более удобен онлайн формат, оффлайн для 25,6% опрошенных, самообучение подходит лишь для 9,9% и 25,35% вовсе не интересуются финансовой грамотностью.

«Финансовое мошенничество» остается актуальным для исследования второй год подряд ввиду применения более изощренных и сложных методов обмана граждан.

В разрезе регионов следует взять во внимание показатели по западным регионам Казахстана: Атырауской - 27,3%, Актюбинской - 26,7% и Мангистауской - 26% областей, где респонденты чаще указывали на то, что сталкивались с мошенничеством.

Жертвами мошенников чаще всего становится молодежь от 18 до 29 лет - 23,1% и люди старшего возраста 50-63 лет - 24,9%. Наиболее распространённым видом финансового мошенничества является телефонное интернет-мошенничество «вишинг» -31,5%. При этом, чаще всего мошенники связываются со своими жертвами посредством звонка на мобильный или городской телефон - 45,6%.

В большинстве случаев респондентам удалось разоблачить мошенников -61%. Идентификация подобных правонарушений сложней всего приходится для людей старше 50 лет - 41% [4].

Для повышения уровня финансовой грамотности в Казахстане необходимо комплексное решение ряда задач.

Образование и просвещение: Введение обязательных курсов по финансовой грамотности в школьные и университетские программы. Программы должны быть адаптированы к различным возрастным группам [5].

Доступ к информации: Создание и развитие онлайн-платформ и мобильных приложений, предоставляющих доступ к финансовой информации, советам и калькуляторам.

Государственные инициативы: Государство должно активно участвовать в инициативах по повышению финансовой грамотности, включая проведение кампаний, семинаров и тренингов.

Сотрудничество с сектором частного капитала: Банки и финансовые организации могут способствовать обучению населения, предлагая обучающие программы и бесплатные семинары.

Поддержка НПО: Неправительственные организации могут сыграть важную роль в финансировании и организации образовательных мероприятий по повышению финансовой грамотности.

Таким образом, финансовая грамотность является ключом к экономической стабильности и благосостоянию граждан РК. Для устойчивого развития необходимо объединение усилий государства, образовательных учреждений и финансового сектора в целях улучшения уровня финансовой грамотности населения. Это позволит не только улучшить качество жизни граждан, но и создать более устойчивую экономику в целом.

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The Relationship Between Rising Credit Risks and Economic Crises

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Abstract. Credit risk refers to the possibility that a borrower will not be able to meet its obligations. An increase in this risk could seriously affect the financial health of banks and the broader economic environment. Credit risks usually increase during economic crises, as economic downturns, unemployment, and declining production worsen borrowers' ability to pay. This article examines the relationship between the increase in credit risks and economic crises, adds the effects of the global financial crisis, and discusses the role of devaluation in the economic context of Azerbaijan.
Keywords: credit, crisis, development

Giriş

Kredit riski, bir borcalanın öhdəliklərini yerinə yetirə bilməməsi ehtimalını ifadə edir. Bu riskin artması, bankların maliyyə sağlamlığına və geniş iqtisadi mühitə ciddi təsir göstərə bilər. İqtisadi böhranlar zamanı kredit riskləri adətən artır, çünki iqtisadi tənəzzül, işsizlik və istehsalın azalması borcalanların ödəmə qabiliyyətini pisləşdirir. Bu məqalə, kredit risklərinin artması ilə iqtisadi böhranlar arasındakı əlaqəni araşdırır, dünya maliyyə böhranının təsirlərini əlavə edir, Azərbaycanın iqtisadi kontekstində devalvasiyanın rolunu müzakirə edir.

Kredit Riskləri və İqtisadi Böhranlar

İqtisadi böhranlar, əksər hallarda, kredit risklərinin artmasına səbəb olur. Bunun bir neçə səbəbi var:

1. İqtisadi Azalma: İqtisadi fəaliyyətin zəifləməsi, müəssisələrin gəlirlərini azaldır və nəticədə borcalanların ödəniş qabiliyyəti düşür. Bu, bankların kredit portfelinin keyfiyyətini pisləşdirir.

2. İşsizlik Səviyyəsinin Artması: Böhran zamanı işsizlik artır, bu da fərdi borcalanların borc öhdəliklərini yerinə yetirmə qabiliyyətini azaldır.

3. Maliyyə Şəffaflığının Azalması: Böhran dövründə müəssisələrin maliyyə vəziyyəti haqqında məlumatlar əksər hallarda qeyri-müəyyəndir, bu da kredit verənlərin risk qiymətləndirməsini çətinləşdirir.

4. Kredit Şərtlərinin Sıxılması: Banklar risklərin artdığını gördükdə kredit şərtlərini sərtləşdirir, bu isə iqtisadi aktivliyi daha da zəiflədir.

Dünya Maliyyə Böhranı

2008-ci ildə başlayan dünya maliyyə böhranı, kredit risklərinin artması və iqtisadi tənəzzül arasında ən diqqətçəkən nümunələrdən biridir. Bu böhranın səbəbləri və təsirləri aşağıdakılardır:

1. Subprime Kreditlərin Artması: ABŞ-da subprime mortgage krediti, daha az maliyyə imkanlarına malik şəxslərə verilən yüksək riskli kreditlərdir. Bu kreditlərin genişlənməsi, bankların kredit risklərini artırdı.

2. Maliyyə İnstitutlarının Zəifliyi: Böhranın başlanğıcında, bir çox maliyyə institutu riskləri düzgün qiymətləndirməmiş və zəif maliyyə sağlamlığına malik idi. Bu, bankların çöküşünə və daha geniş maliyyə sisteminin zədələnməsinə səbəb oldu.

3. Qlobal İqtisadi Tənəzzül: Dünya iqtisadiyyatı 2008-ci ildən sonra dərin tənəzzülə uğradı. Bu, işsizliyin artması və istehsalın azalması ilə nəticələndi, bu da borcalanların ödəmə qabiliyyətini daha da pisləşdirdi.

4. Bankların Kredit Portfelinin Keyfiyyətinin Pisləşməsi: Maliyyə böhranı, bankların kredit portfellərindəki problemləri daha da dərinləşdirdi. Çox sayda bank, kreditin geri qaytarılmasında çətinliklərlə üzləşdi, bu da onların maliyyə sağlamlığını təhlükəyə atdı.

Azərbaycanın İqtisadi Konteksti

Azərbaycanda son illərdə baş verən iqtisadi dəyişikliklər, kredit risklərinin artması ilə bağlıdır. 2015-ci ildən etibarən, neft qiymətlərinin kəskin düşməsi iqtisadiyyata ciddi təsir etdi. Bu dövrdə baş verən devalvasiyalar, ölkənin iqtisadi sabitliyini daha da çətinləşdirdi.

1. Neftin Qiymətinin Təsiri: Neft sektoru Azərbaycan iqtisadiyyatının əsasını təşkil edir. Neft qiymətlərinin düşməsi, dövlətin gəlirlərini azaldır və bu da iqtisadi aktivliyi zəiflədir.

2. Devalvasiya: 2015-ci ildə baş verən devalvasiya, manatın dəyərinin əhəmiyyətli dərəcədə azalması ilə nəticələndi. Bu, idxal olunan malların qiymətinin artmasına, inflyasiyaya və yerli istehlakçıların maliyyə vəziyyətinin pisləşməsinə səbəb oldu. Banklar, müştərilərinin borc öhdəliklərinin artması səbəbindən kredit risklərini daha da artırdı.

3. Bankların Problemləri: Neft qiymətlərinin düşməsi və devalvasiya nəticəsində, bir çox müstəqil müəssisə maliyyə çətinlikləri ilə üzləşdi, bu da bankların kredit risklərini artırdı.

4. İşsizlik və Sosial Problemlər: İqtisadi böhran dövründə işsizlik artdı, bu da insanların kredit öhdəliklərini yerinə yetirmə qabiliyyətini azaltdı.

5. Maliyyə İdarəetməsi: Azərbaycanın maliyyə sektoru, dünya maliyyə böhranından dərs alaraq kredit risklərini daha səmərəli idarə etməyə çalışır. Banklar, kredit vermə prosesində daha ehtiyatlı yanaşma tətbiq etməyə başlayıblar.

Nəticə

Kredit risklərinin artması və iqtisadi böhranlar arasında sıx bir əlaqə mövcuddur. Dünya maliyyə böhranı və Azərbaycanın devalvasiyaları, bu əlaqənin açıq nümunələridir.

Kredit risklərinin artması, bankların maliyyə sağlamlığına və iqtisadi inkişafın davamlılığına ciddi təsir edə bilər. Bu fenomenin qarşısını almaq üçün banklar daha mükəmməl risk qiymətləndirmə sistemləri inkişaf etdirməli, dövlət isə iqtisadi stabilizasiya proqramları hazırlamalıdır. Belə

yanaşmalar, kredit risklərini minimuma endirmək və iqtisadi böhranların təsirlərini azaltmaq üçün vacibdir.

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Productivité de Travail et Progrès Technologique Exogène, Approches Théoriques par la Comptabilisation de Croissance

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Résumé

Dans une économie où l'investissement en capital physique doit induire des gains de productivité, l'existence de progrès technologique incorporé aux équipements reste fondamentale. Solow à travers le modèle exogène de croissance économique est d'une référence théorique en terme de croissance et de productivité, dont un potentiel important du modèle pourrait être libéré si une démarche mathématique différente de ce qui est communément connu est adoptée, dans le cas où le progrès technologique renforçant le capital. Cet article développe le cadre théorique du modèle exogène de Solow, à partir de la méthodologie de comptabilisation de croissance pour contempler, principalement, le lien entre « productivité du travail » et « progrès technologique exogène ». Le résultat met théoriquement en valeur la relation entre l'investissement et la productivité de travail grâce à l'existence du progrès technologique, incorporé dans le capital. À partir d'un modèle de croissance exogène de Solow, l'idée a été de partir d'un modèle simple, toutefois puissant, pour présenter l'importance du progrès technologique pour le renforcement de la productivité du travail, par conséquent la croissance économique. La nouvelle approche comptable dans le cas du progrès technologique renforçant le capital a permis d'obtenir un résultat où l'influence du progrès technologique exogène est très grande dans la croissance de la productivité du travail. Toutefois, à la différence du résultat de Solow, le coefficient du capital (α) pourrait être conditionné à une valeur strictement supérieure à 0, 5. Ce qui suggère un déséquilibre significatif dans la répartition des revenus entre le capital et le travail. Ce phénomène devrait expliquer la forte croissance, dans des conditions très inégalitaires, des pays développés, au cours des années 1960, 1970, puisque les détenteurs de capital bénéficiaient plus que les travailleurs.

Mots clés : Modèle exogène de Solow, Progrès technologique, Productivité du travail

1. Introduction

Dans le modèle exogène de Solow, R. (1957), « plusieurs, voire, même, la majorité des innovations doivent être incorporées à de nouveaux types de biens et équipements durables, avant qu'elles ne puissent être efficace ». Une notion sous-jacente du progrès technologique incorporé dans le capital selon Surendra, G et Al (1998), qui le retient comme facteur explicatif du ralentissement de la productivité au Canada depuis 1973. Une étude de Wolf (1996) sur l'effet de génération avait confirmé de résultat similaire pour les pays de l'OCDE pour la même période. Wolf a conclu que l'âge moyen du stock de capital expliquait en moyenne environ 40% du ralentissement de la productivité.

Alors que les économies contemporaines évoluent rapidement, le lien entre « croissance de la productivité de travail », « le progrès technologique » et « la croissance du rapport capital par

tête », souvent perçu comme un facteur de croissance économique, mérite une exploration approfondie par les pays en développement. Cette relation est d'autant plus pertinente dans le contexte où le progrès technologique est largement influencé par des facteurs extérieurs à l'économie nationale, tels que les innovations internationales, les avancées scientifiques globales, et les politiques technologiques étrangères. À court terme, Schumpeter, J. A. (1999) explique que seules les économies qui prennent les risques d'innover bénéficient de progrès techniques et des revenus qu'ils génèrent.

Dans une économie où l'investissement en capital physique doit induire des gains de productivité, l'existence d'un progrès technologique incorporé aux équipements reste fondamentale (Gilbert, C, et al, 1990). Toutefois, si généralement on considère l'accumulation du capital s'accompagne d'un effet d'incorporation du progrès technique, la difficulté c'est de quantifier cet effet (OCDE, 1979 ; Helliwell et al, 1986).

Les études de (Hulten, 1992 ; Abramovitz, 1994) s'appuyaient sur un cadre de comptabilisation de croissance pour expliquer le rôle important du progrès technique incorporé au capital en tant qu'élément de croissance de la productivité aux États Unis. La mesure traditionnelle de comptabilisation de croissance, selon l'analyse de Timothy, C et al (2000) offre une mesure pertinente de la croissance de la productivité de travail, qui dépend du progrès technologique dissocié et du progrès technologique incorporé dans le capital, à long terme. Par conséquent, à travers cette méthode de quantification de la croissance, l'existence de nouvelles technologies incorporées justifie la corrélation entre le stock de capital et la croissance de la productivité.

L'objectif de cet article consiste à développer le cadre théorique du modèle exogène de Solow, à partir de la méthodologie de comptabilisation de croissance pour contempler, principalement, le lien entre « productivité du travail » et « progrès technologique exogène ». Il s'agit d'explorer comment les innovations et les avancées technologiques, qui ne sont pas générées directement par les acteurs économiques locaux mais importées de l'extérieur, affectent la productivité des secteurs économiques. Présenter de manière claire, à travers des relations mathématiques, les mécanismes par lesquels le progrès technologique influence la productivité, afin de permettre une validation empirique.

2. La méthode de comptabilisation de croissance

Les analyses par la comptabilisation de croissance ont été présentés pour la première fois par Solow (1957). En effet, la croissance d'une économie peut être décomposée à partir de la croissance des différents facteurs utilisés au sein du processus de production. Un exemple simple est celui de la fonction de production du type Cobb Douglas, soit $\mathrm{Y_t = F(A_t, K_t, L_t) = A_t . K_t^{\alpha} . L_t^{\beta}}$, l'expression signifie la production Y en fonction des facteurs de production capital (K) et le travail (L). Le facteur A représente un niveau technologique. En passant en dérivation logarithmique, la fonction de production de Cobb-Douglas devient alors :

$$\mathrm{dlog\ Y = dlogA + \alpha dlogK + (1- \alpha)dlogL,}$$

puisque pour de petites variations, la différence des logarithmes est une approximation des taux de croissance, alors on peut écrire l'équation précédente de la manière suivante :

$$\frac{\dot{Y_t}}{Y_t} = \frac{\dot{A_t}}{A_t} + \frac{\partial Y_t}{\partial K_t}\frac{K_t}{Y_t}\frac{\dot{K_t}}{K_t} + \frac{\partial Y_t}{\partial K_t}\frac{L_t}{Y_t}\frac{\dot{L_t}}{L_t}.$$

Dans le modèle néoclassique de croissance, le facteur de production est rémunéré par sa productivité marginale, avec $\frac{\partial Y}{\partial K} = \alpha\frac{AK^{\alpha}L^{1-\alpha}}{K}$, ensuite $\frac{\partial Y}{\partial K} = \alpha\frac{Y}{K}$, puis $\alpha = \frac{\partial Y}{\partial K}\frac{K}{Y}$. Finalement, la croissance du niveau technologique $\frac{\dot{A_t}}{A_t} = \frac{\dot{Y_t}}{Y_t} - \alpha\frac{\dot{K_t}}{K_t} - (1- \alpha)\frac{\dot{L_t}}{L_t}$. Ce résidu est connu sous le nom de résidu de Solow.

3. Résultats

3.1 Approche comptabilisation de croissance dans le modèle de Solow avec technologie

La présence de la technologie exogène améliore la productivité de travail, et par conséquent la croissance, dans le modèle de Solow avec technologie de la forme Y=F (K, AL). Cependant, mathématiquement, en évaluant la contribution des facteurs de production, l'utilisation de la technologie, qui vise à répondre l'énigme de croissance durable, semble en contradiction dans le modèle.

En effet, on a la fonction de production de type Cobb Douglas : $\mathrm{Y} = \mathrm{F}(\mathrm{K}, \mathrm{AL}) = \mathrm{K}^{\alpha}(\mathrm{AL})^{1-\alpha}$, le modèle sous hypothèse de rendement d' échelle constant conformément le modèle exogène de Solow où $(mK)^{\alpha}(mAL)^{1-\alpha} = m^{\alpha}m^{1-\alpha}K^{\alpha}(AL)^{1-\alpha} = mY$. En calculant la productivité moyenne de travail, de cette fonction de production, notée PT. On a, PT = $\frac{Y}{L} = \frac{K^{\propto}.(AL)^{1-\propto}}{L} = \frac{K^{\propto}A^{1-\propto}L^{1-\propto}}{L} = A^{1-\propto}(\frac{K}{L})^{\propto}$.

Puis, PT= $A^{1-\propto}(k)^{\propto}$, la décomposition de la croissance de productivité de travail réalisée à l'aide de la méthode de la comptabilisation de croissance permet de mettre en évidence la très forte contribution, soit $(\frac{\dot{\mathrm{PT}}}{\mathrm{PT}})_{\mathrm{AL}} = \alpha\frac{\dot{k}}{k} + (1-\alpha)(\frac{\dot{A}}{A}) = \alpha(\emptyset_k) + (1-\alpha)(g)$, avec k= K/L.

En adoptant une nouvelle approche, dans le cas du progrès technologique renforçant le capital, le modèle présente l'avantage d'être plus cohérente avec l'intuition de l'utilisation d'équipements très évolués pour plus d'impacts sur la productivité.

3.2 Nouvelle approche comptable dans le cas du progrès technologique renforçant le capital

Soit, la fonction de production $\mathrm{Y} = \mathrm{F}(\mathrm{AK}, \mathrm{L}) = (\mathrm{AK})^{\propto}\mathrm{L}^{1-\propto} = \widetilde{\mathrm{K}}^{\propto}\mathrm{L}^{1-\propto}$. On a la productivité de travail, PT = $\frac{Y}{L} = \frac{\tilde{K}^{\propto}.L^{1-\propto}}{L} = \frac{A^{\propto}K^{\propto}L^{1-\propto}}{L} = A^{\propto}(\frac{K}{L})^{\propto}$, puis, PT= $A^{\propto}(k)^{\propto}$ Ce qui, par dérivation logarithmique, donne l'équation de gain de productivité de travail $(\frac{\dot{PT}}{PT})_{AK}$ égal,

$$(\frac{\dot{PT}}{PT})_{AK} = \alpha\frac{\dot{A}}{A} + \alpha\frac{\dot{k}}{k} = \alpha(\frac{\dot{A}}{A} + \frac{\dot{k}}{k}) = \alpha(g + \emptyset_k),$$ avec k= K/L.

Par ailleurs, afin, de bien analyser la dynamique de long terme, il est nécessaire d'opter pour le calcul de sa variation entre les périodes, soit t à t+1, ce qui donne l'équation suivante,

Soit, $\Delta(\frac{\dot{PT}}{PT})_{AK} = \alpha(g_{i+1} - g_i) + \alpha(\emptyset_{k_i+1} - \emptyset_{k_i})$,

Alors, on obtient $\Delta(\frac{\dot{PT}}{PT})_{AK} = \alpha(\Delta g + \Delta\emptyset_k)$

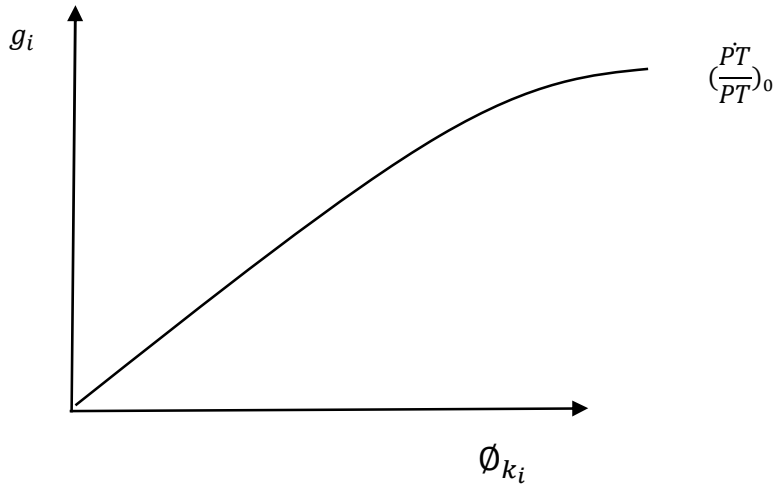
Cas 1 : $\mathbf{g} = \emptyset_{\mathbf{k}} = 0$

Si le progrès technologique (g) est égal à la croissance du capital par tête (Øk), et que leurs valeurs respectives entre les périodes (t) et (t+1) sont nulles ($\mathrm{g_{i+1}} = \mathrm{g_i} = 0$), et $(\emptyset_{\mathrm{k_i+1}} = \emptyset_{\mathrm{k_i}} = 0)$,alors $\mathrm{g} + \emptyset_{\mathrm{k}} = 0$, ce qui signifie que l'économie ne progresse pas en termes de productivité $(\frac{\dot{\mathrm{PT}}}{\mathrm{PT}})_{\mathrm{AK}} = 0$. À long terme, l'économie converge vers un état stationnaire, car le capital physique par tête est soumis à des rendements décroissants. Il s'agit des conditions d' Inada(1963) selon lesquelles lim $\alpha k^{\alpha-1} = \infty$, lim $\alpha k^{\alpha-1} = 0$.

$k \to 0$ $\quad\quad$ $k \to \infty$

Cette dynamique est illustrée dans le graphique ci-dessous.

Figure1. La croissance de la productivité est nulle

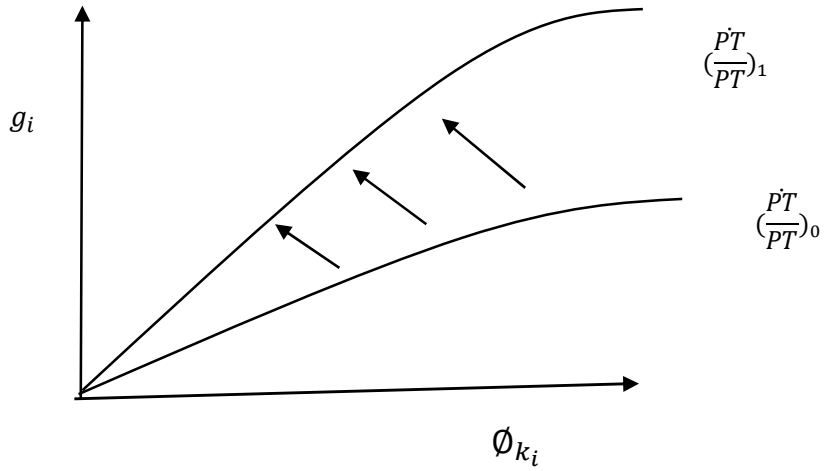


Cas 2 : $\boldsymbol{g > \emptyset_k}$

L'économie fait face de l'instant (t) à (t+1) à un renouvellement de capital, ce qui lui permet, tout aussi bien d'acquérir, également d'incorporer les technologies exogènes les plus avancées à un rythme croissant ($g_{i+1} > g_i$). On assiste à de forte présence des effets positifs de progrès technologique intégré au capital ($\boldsymbol{g > \emptyset_k}$), de suite à un lien de complémentarité significatif entre l'accumulation du capital et le progrès technologique exogène (voir aussi Greenwood, J., et al, 2001 ; Musso, P. , 2004). L'économie progresse énormément en productivité de travail : $(\frac{\dot{P}T}{PT})_{AK}$= $\alpha(g + \emptyset_k) > 0$.

Graphiquement, la dynamique se présente comme ci-dessous :

Figure 2. Variation à forte croissante de la croissance de la productivité



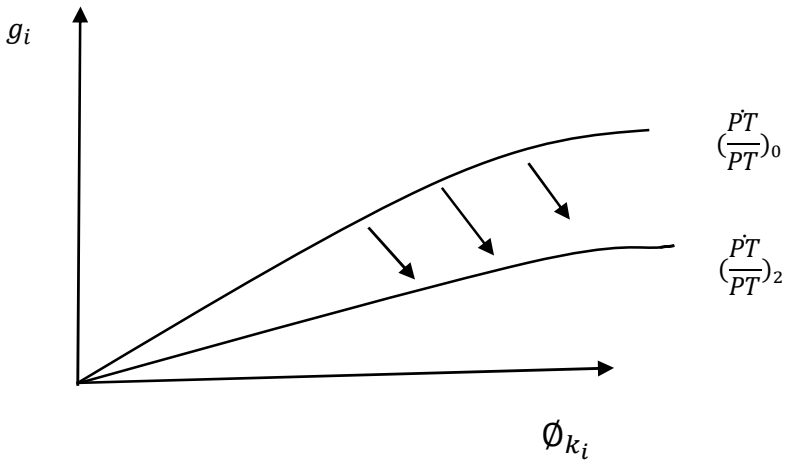
Source : Auteur, 2024

Cas 3 : $\boldsymbol{g < \emptyset_k}$

L'augmentation de l'âge du stock de capital affecte négativement la productivité de travail, ce qui favorise $(\frac{\dot{P}T}{PT})_2 < (\frac{\dot{P}T}{PT})_1$. La croissance de la productivité du travail dépend davantage de l'intensité capitalistique que de l'amélioration du progrès technologique exogène. Le ratio capital-travail $(\emptyset_k)$ joue un rôle clé, influençant à la fois l'accélération ou le ralentissement de la croissance de la productivité du travail. Un tel cas, fréquemment observé dans les pays en développement en raison des fluctuations instables du progrès technologique exogène, pourrait néanmoins aboutir

à une amélioration économique grâce à une accélération de l'intensité capitalistique par tête (voir aussi Hulten, 1992 ; Englander et Gurney , 1994 ; Wolff, 1996).

Figure 3. Variation à faible croissance de la productivité



Source : Auteur, 2024

4. Discussions théoriques

La nouvelle technologie est dans la plupart insérée dans de nouveaux biens de production, tout investissement brut dans le renouvellement de capital productif est susceptible de constituer de transfert technologique exogène, et par conséquent le changement technologique dans le processus de production. Toutefois, dans le modèle néoclassique de base, Timothy, C et al (2000) ajoute qu'il ne faut pas voir dans le taux d'accumulation du capital comme un déterminant exogène de la croissance de production. Ils expliquent « la qualité de nouveaux biens de production augmente, mais c'est un processus purement exogène, qui n'a rien à voir avec l'augmentation de l'investissement ». Richard, G. L et al (2000) parle d'une interrelation entre le changement technologique et l'investissement. Ce dernier comme un véhicule qui transporte le changement technologique dans le processus de production.

Dans l'un de ses ouvrages centraux « Capitalisme, socialisme, et démocratie (1942), Joseph Schumpeter, économiste hétérodoxe australien, expliquait que seules les économies qui prennent les risques d'innover ($g_{i+1} > g_i$) bénéficient de progrès technologique et des revenus qu'ils génèrent. Il ajoute ainsi un rôle clé dans la dynamique de long terme du capitalisme, en considérant le progrès technique à l'origine du processus de « destruction- création ».

Par ailleurs, suite à la baisse de la productivité dans les pays développés à partir des années 1970, de nombreux économistes ont formulé des observations divergentes. Richard, G. Lipsey et al (2000) ajoute que « les changements de productivité et les changements technologiques ne sont pas directement proportionnels, quantitativement parlant » Il n' y a pas de raison, à long terme, à ce que $Y(K_2) - Y(K_1) < Y(K_3) - Y(K_2) < Y(K_4) - Y(K_3) < \ldots < Y(K_n) - Y(K_{n-1})$ avec K_t et $Y(K_n) - Y(K_{n-1})$, respectivement, les technologies successives et l' accroissement de la valeur totale de la production au passage d'une technologie à une autre.

Face à la thèse de l'épuisement de l'innovation, l'économiste américain Robert Gordon (2012) considère que « l'innovation, depuis 2000, est centrée sur le loisir et la consommation, mais ne change pas fondamentalement la productivité du travail ou le mode de vie, comme la lumière électrique, l'automobile ou l'eau courante l'ont fait ». Une idée centrale assez proche de Jan Vijg (2011) qui a mis au point un indicateur d'intensité de l'innovation. À travers son analyse,

l'innovation diminuait à partir des années 1970, la troisième révolution industrielle liée à l'informatique et aux nouvellement technologies de l'information de de communication (NTIC). Yves Besanxon (2016), en réponse à la théorie de Joseph Schumpeter, ajoute que « la destruction créatrice » se transformait alors inexorablement en « destruction- destructive », car les créations d'emplois induits par la croissance ne compenseraient plus les destructions d'emplois initiales ». À partir d'une relation mathématique, il soutient ses idées que si N population active occupée, alors le $PIB = \left(\frac{PIB}{N}\right).N$ Ce qui veut dire le PIB c'est le produit de la production apparente du travail par tête $\left(\frac{PIB}{N}\right)$ et du (N) niveau d'emploi. A partir d'une relation algébrique élémentaire, on a : Variation de l'emploi (en %) = Variation PIB (en %) – Variation de la productivité de travail par tête (en %). À court terme, les gains de productivité à la suite du progrès technologique jouaient contre l'emploi. Par contre, à moyen et long terme, explique Yves Besançon les gains de productivité produisent des effets vertueux entrainant la croissance du PIB supérieure à celle de la productivité. Ce qui progresse l'emploi.

5. Conclusion

L'approche de cette étude met en valeur la relation entre l'investissement et la productivité de travail grâce à l'existence du progrès technologique, incorporé dans le capital. À partir d'un modèle de croissance exogène de Solow, l'idée a été de partir d'un modèle simple, toutefois puissant, pour présenter l'importance du progrès technologique pour le renforcement de la productivité du travail, par conséquent la croissance économique.

L'application d'une telle stratégie pour les pays en développement sont remarquables à de nombreuses études. Pour les pays d'Afrique subsaharienne, doper la productivité de travail constitue un moyen de sortir l'extrême pauvreté, et de suivre les expériences économiques réussites de pays émergents. Selon un rapport de Banque Mondiale (2022), l'analyse des données de l'Afrique subsaharienne de 1960 à 2017 montre que la productivité de travail est en retard en Afrique en comparant aux expériences du Brésil, la Chine, l'Inde et plusieurs « tigres et dragons asiatiques ». Ces pays ont apporté la prospérité économique, grâce à des gains de productivité variables, mais constants. En se référant à notre étude, cela pourrait correspondre au cas $\boldsymbol{g > \emptyset_k}$, forte présence des effets positifs de progrès technologique intégré au capital.

La nouvelle approche comptable dans le cas du progrès technologique renforçant le capital a permis d'obtenir un résultat où l'influence du progrès technologique exogène est très grande dans la croissance de la productivité du travail. Toutefois, à la différence du résultat de Solow, le coefficient du capital (α) pourrait être conditionné à une valeur supérieure à 0, 5. Ce qui suggère un déséquilibre significatif dans la répartition des revenus entre le capital et le travail. Ce phénomène devrait expliquer la forte croissance, dans des conditions très inégalitaires, des pays développés, au cours des années 1960, 1970, puisque les détenteurs de capital bénéficiaient plus que les travailleurs. Ce qui aurait alimenté les tensions sociales et économique, limitant ainsi la soutenabilité du modèle exogène de Solow, avec progrès technologique renforçant le capital, uniquement à court terme.

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ОСОБЕННОСТИ И ВЫЗОВЫ КАДРОВОГО ПЛАНИРОВАНИЯ В ОБРАЗОВАТЕЛЬНЫХ УЧРЕЖДЕНИЯХ ЗДРАВООХРАНЕНИЯ: ТЕОРЕТИЧЕСКИЙ ПОДХОД

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Аннотация. В современных условиях система здравоохранения претерпевает значительные изменения, обусловленные технологическим прогрессом, ростом цифровизации и развитием междисциплинарного подхода в медицинской практике. Указанные тенденции формируют новые требования к подготовке медицинских специалистов и соответственно, оказывают влияние на кадровую политику образовательных учреждений, ответственных за их обучение. Данное исследование анализирует ключевые особенности и вызовы, связанные с кадровым планированием в образовательных учреждениях здравоохранения, акцентируя внимание на необходимости адаптации кадров к современным требованиям. В частности, рассмотрены квалификационные стандарты для преподавателей, нормативно-правовые аспекты, а также необходимость регулярного повышения квалификации и сертификации преподавательского состава для обеспечения актуальности знаний и навыков в сфере здравоохранения.

Исследование подчеркивает важность гибкости кадрового состава, особенно в условиях глобальных кризисов, таких как пандемия COVID-19, которая продемонстрировала необходимость быстрого перехода к дистанционным форматам обучения. Кроме того, развитие дистанционного здравоохранения и внедрение цифровых технологий требует от преподавателей дополнительных компетенций в области телемедицины, цифровых платформ и информационных систем, что также меняет традиционные подходы к образовательному процессу. Отмечена актуальность междисциплинарных навыков, включая основы психологии, социальной работы и менеджмента, для подготовки студентов к комплексному подходу в медицинской практике.

Ключевые слова: *кадровое планирование, здравоохранение, цифровизация, междисциплинарные навыки, образовательные стандарты.*

В современном мире здравоохранение играет ключевую роль в поддержании качества жизни населения, и уровень подготовки медицинских специалистов во многом определяет эффективность этой сферы. Образовательные учреждения, готовящие медицинских специалистов, сталкиваются с необходимостью не только обеспечивать качественное обучение, но и поддерживать высокие требования к компетенциям и квалификации преподавательского состава. Данная потребность обусловлена изменяющимися стандартами в здравоохранении и растущими ожиданиями общества, что делает кадровое обеспечение в медицинском образовании актуальной задачей [1]. Квалификационные стандарты, которые предъявляются к преподавателям в медицинских образовательных учреждениях, должны соответствовать строгим нормативным

требованиям и профессиональным критериям. Стандарты включают не только глубокие знания в специализированных областях медицины, но и владение современными образовательными методиками, что необходимо для качественной подготовки студентов [2]. Важность педагогической квалификации преподавателей медицинских дисциплин также подчеркивается стандартами Всемирной организации здравоохранения, которые требуют от преподавателей умения адаптировать программы к меняющимся потребностям системы здравоохранения [3].

Особое значение в кадровом обеспечении медицинских образовательных учреждений имеют нормативно-правовые требования, направленные на регулирование квалификаций и компетенций преподавательского состава. Например, в соответствии с национальными стандартами многих стран, преподаватели обязаны регулярно проходить переподготовку и повышение квалификации, чтобы обеспечивать студентов актуальными знаниями и навыками, отвечающими современным стандартам здравоохранения [4].

В ряде стран установлены требования к обязательной сертификации преподавателей и их участию в профессиональных сообществах, что способствует постоянному обновлению знаний и обмену передовыми практиками [5].

К тому же, в условиях растущей цифровизации и внедрения телемедицины, преподаватели обязаны владеть не только медицинскими знаниями, но и навыками работы с новыми технологиями, включая цифровые платформы и системы электронного здравоохранения [6].

Изменения обуславливают необходимость пересмотра подходов к отбору и развитию кадров в образовательных учреждениях здравоохранения, где должны применяться инновационные подходы для поддержки профессионального развития преподавательского состава и его адаптации к новым вызовам.

Таким образом, кадровое планирование в медицинских образовательных учреждениях должно учитывать высокие требования к компетенциям преподавателей, которые включают в себя как медицинские знания, так и педагогические и технологические навыки. Только через обеспечение высокой квалификации и постоянное развитие кадров образовательные учреждения смогут подготовить специалистов, способных удовлетворять потребности современного здравоохранения и отвечать на вызовы, стоящие перед системой здравоохранения в условиях глобализации и технологического прогресса [7].

В Казахстане государственная политика в области медицинского образования ориентирована на повышение качества подготовки специалистов и их соответствие международным стандартам. Центральное место в нормативно-правовом регулировании занимают такие документы, как Закон Республики Казахстан «Об образовании» и постановления Министерства здравоохранения Республики Казахстан, которые устанавливают требования к квалификационному уровню преподавателей и процессу их аттестации [8].

Данные нормативные акты требуют, чтобы преподаватели, работающие в медицинских учебных заведениях, обладали не только профильным медицинским образованием, но и соответствующими педагогическими навыками, что подчеркивает комплексность кадровых требований.

Кроме того, значительное влияние на кадровое обеспечение в медицинских образовательных учреждениях оказывает национальный стандарт «Образовательные программы подготовки кадров в здравоохранении», который был разработан в соответствии с Болонским процессом и рекомендациями Всемирной организации здравоохранения. Стандарт обязывает медицинские колледжи и университеты регулярно пересматривать квалификационные требования к преподавателям, уделяя особое внимание их способности обучать студентов согласно современным клиническим стандартам и методикам [9].

Подобные требования стимулируют учреждения к привлечению кадров с актуальными медицинскими компетенциями и мотивируют преподавателей к постоянному профессиональному росту.

Важным аспектом также является введение системы сертификации и аккредитации преподавателей в рамках Программы государственного развития здравоохранения Республики Казахстан. Согласно программе, медицинские образовательные учреждения обязаны не только проводить аттестацию преподавателей, но и предоставлять им возможности для регулярного повышения квалификации и участия в международных конференциях и семинарах, что способствует их профессиональному развитию [10].

Таким образом, нормативно-правовые акты Казахстана формируют высокие требования к квалификации преподавательского состава медицинских образовательных учреждений, что позволяет поддерживать высокий уровень подготовки медицинских специалистов. Постоянное совершенствование законодательной базы и её адаптация к международным стандартам помогает казахстанской системе здравоохранения успешно справляться с вызовами, связанными с кадровым обеспечением, и создает условия для устойчивого развития сферы образования в здравоохранении.

Таблица 1 Специфики кадрового планирования для системы здравоохранения

Аспект	Описание
Квалификационные стандарты	Преподаватели должны иметь специализированные знания и владеть методиками обучения, что необходимо для качественной подготовки студентов.
Нормативно-правовые требования	Требования к регулярной переподготовке и сертификации преподавателей, направленные на поддержание актуальности знаний и навыков в сфере здравоохранения.
Адаптация к цифровым технологиям	Преподаватели должны уметь работать с телемедицинскими платформами и электронными системами, чтобы обучать студентов работе в цифровой среде.
Система сертификации и аккредитации	Требования к сертификации и аккредитации преподавателей обеспечивают высокий уровень компетенций и непрерывное профессиональное развитие.
Международные стандарты	Национальные стандарты разрабатываются с учетом рекомендаций ВОЗ и Болонского процесса для соответствия международным требованиям.
Требования к педагогической квалификации	Умение преподавателей адаптировать программы под потребности студентов и изменения в системе здравоохранения.
Постоянное повышение квалификации	Преподаватели обязаны проходить регулярное повышение квалификации и участвовать в семинарах, конференциях для развития профессиональных компетенций.
Национальные образовательные программы	Программы разрабатываются с учетом Болонского процесса, что способствует профессиональному росту преподавателей и их адаптации к международным стандартам.
Примечание: составлена на основе источников [5-11].	

Таблица раскрывает основные аспекты, которые определяют специфику кадрового планирования в системе здравоохранения. Одним из ключевых элементов является соответствие преподавателей медицинских образовательных учреждений

квалификационным стандартам. Стандарты требуют не только глубоких знаний в области медицины, но и владения современными методиками преподавания, что позволяет эффективно передавать знания студентам. Помимо этого, значительную роль играют нормативно-правовые требования, которые обязывают преподавателей регулярно проходить переподготовку и сертификацию, обеспечивая соответствие их знаний современным стандартам здравоохранения. Поддержание актуальных компетенций преподавателей особенно важно в условиях быстрого развития медицинской сферы и растущих ожиданий общества.

Важное место в кадровом планировании занимает внедрение цифровых технологий. Преподаватели обязаны осваивать телемедицинские платформы и электронные системы здравоохранения, чтобы обучать студентов необходимым навыкам для работы в цифровой среде. Введение системы сертификации и аккредитации также способствует поддержанию высокого уровня компетенций среди преподавателей, требуя постоянного профессионального развития и участия в образовательных мероприятиях. Кроме того, адаптация национальных образовательных стандартов к международным, например, рекомендациям ВОЗ и Болонского процесса, позволяет казахстанской системе здравоохранения соответствовать глобальным требованиям, создавая устойчивую и гибкую образовательную среду для подготовки медицинских специалистов.

Современная система здравоохранения переживает интенсивные изменения, обусловленные как развитием технологий, так и появлением новых подходов к лечению и диагностике. Перемены требуют от образовательных учреждений быстрой адаптации, чтобы обеспечивать актуальные компетенции у специалистов, работающих в медицинской сфере. Преподаватели, занимающиеся подготовкой будущих медицинских работников, должны обладать соответствующими знаниями и навыками, чтобы обучать студентов последним достижениям и методам лечения, внедряемым в практику [12].

В этом контексте образовательные стандарты и компетенции, ориентированные на текущие и прогнозируемые потребности здравоохранения, играют решающую роль.

Необходимость адаптации кадров образовательных учреждений здравоохранения к новым требованиям особенно заметна в условиях цифровизации. Внедрение цифровых технологий, таких как электронные медицинские записи, телемедицина и системы искусственного интеллекта, требует от преподавателей не только знания основ медицины, но и навыков работы с новыми цифровыми инструментами [13].

Например, в некоторых странах, таких как США и Великобритания, образовательные программы для медицинских преподавателей уже включают курсы по цифровой грамотности и работе с инновационными технологиями, чтобы обеспечить соответствие квалификаций преподавателей требованиям цифрового здравоохранения [14].

Казахстан, в свою очередь, внедряет элементы цифровизации в программу подготовки медицинских специалистов в рамках государственной программы «Цифровой Казахстан», что также требует модернизации кадрового состава и образовательных программ [15].

Сравнение национальных и международных стандартов позволяет оценить степень соответствия подготовки преподавательского состава глобальным требованиям. Например, стандарты Всемирной организации здравоохранения (ВОЗ) предлагают руководящие принципы, ориентированные на повышение устойчивости систем здравоохранения, что подразумевает обучение специалистов современным технологиям и междисциплинарному подходу [16].

Казахстанские стандарты, включая национальные образовательные программы и квалификационные требования, разрабатываются с учетом этих международных рекомендаций и адаптируются для национальной системы здравоохранения [17].

Внедрение таких стандартов помогает создавать образовательные программы, которые соответствуют как потребностям внутреннего рынка, так и международным требованиям.

Матрица 1 отражает важность образовательных стандартов и обновляющихся компетенций для подготовки медицинских кадров. Адаптация учебных программ, цифровизация и поддержка междисциплинарного подхода играют ключевую роль в обеспечении качественного медицинского образования, соответствующего как национальным, так и международным требованиям.

Однако, несмотря на активное развитие национальных стандартов, остаются вызовы, связанные с адаптацией кадрового состава к обновляющимся компетенциям. Например, в странах с высокоразвитыми системами здравоохранения активно внедряются модули по обучению междисциплинарным методам, что требует от преподавателей не только знаний в своей узкой области, но и навыков координации с другими специалистами, включая психологов, фармацевтов и специалистов по социальной работе [18].

Аспект	Описание	Примеры/источники	Значимость
Изменения в здравоохранении	Технологический прогресс и новые методы лечения требуют обновления компетенций у преподавателей для подготовки специалистов, способных работать в условиях современных вызовов.	McGaghie, 2020; Frenk et al., 2019	Обеспечивает актуальность знаний и методов обучения для подготовки квалифицированных кадров.
Цифровизация и технологические навыки	Внедрение цифровых технологий (электронные медзаписи, телемедицина, ИИ) требует от преподавателей знаний и навыков работы с новыми цифровыми инструментами.	Topol, 2019; Программа "Цифровой Казахстан", 2025	Подготовка студентов к работе в цифровой среде и повышение качества медицинской помощи через использование технологий.
Сравнение национальных и международных стандартов	Оценка и адаптация национальных стандартов в соответствии с международными рекомендациями позволяет обеспечить качество и актуальность ОП.	Министерство здравоохранения РК, 2023; WHO, 2019	Гарантирует, что медицинское образование в Казахстане соответствует глобальным требованиям и потребностям национального рынка труда.

Аспект	Описание	Примеры/источники	Значимость
Обновляющиеся компетенции	Регулярное обновление ОП и внедрение междисциплинарных навыков позволяют преподавателям готовить студентов к комплексной работе с пациентами.	Frenk et al., 2019	Позволяет адаптировать учебные программы к новым вызовам, улучшая подготовку специалистов и повышая качество медицинского обслуживания.
Поддержка междисциплинарного подхода	Требование координации знаний и навыков между различными специалистами (психологами, фармацевтами, соц. работниками) для более комплексного подхода к обучению и лечению.	Frenk et al., 2019	Усиливает подготовку студентов к командной работе и междисциплинарному взаимодействию, что важно для комплексного подхода
Проблемы адаптации кадров	Внедрение новых стандартов и компетенций требует от ППС не только базовых знаний, но и постоянного повышения квалификации и навыков работы с новыми технологиями и методиками.	Национальные и международные стандарты	Поддерживает актуальность кадрового состава, обеспечивая соответствие современным образовательным стандартам и требованиям системы здравоохранения.
Инвестиции в подготовку преподавателей	Для полноценного внедрения стандартов и современных методов требуется дополнительное финансирование, направленное на развитие кадров.	Национальные образовательные программы и политика Казахстана	Способствует улучшению образовательного процесса и готовности преподавателей к новым задачам, соответствующим требованиям современной системы здравоохранения.

Рисунок 1 Матрица образовательных стандартов и обновляющихся компетенций в медицинской сфере

Примечание: составлена на основе [12-17].

В Казахстане такой подход также находит свое отражение в образовательных программах, но его внедрение требует дополнительных инвестиций и подготовки преподавательского состава.

Современные тенденции в здравоохранении значительно трансформируют требования к подготовке медицинских специалистов. Технологический прогресс, увеличение роли дистанционного здравоохранения и растущие потребности в специалистах с междисциплинарными навыками требуют от образовательных учреждений адаптации кадровой политики к новым реалиям. Эти тенденции формируют не только профессиональные ожидания к выпускникам, но и значительно влияют на компетенции преподавателей, ответственных за подготовку кадров в сфере здравоохранения. Необходимость гибкости кадрового состава становится критической для оперативного реагирования на изменения и потребности системы здравоохранения, поскольку она позволяет образовательным учреждениям своевременно внедрять нововведения и подготавливать специалистов, отвечающих актуальным стандартам [19].

Одной из ключевых тенденций, оказывающей влияние на кадровую политику образовательных учреждений, является развитие дистанционного здравоохранения. Переход к дистанционным форматам медицинской помощи требует от преподавателей не только знания основ медицинских дисциплин, но и компетенций в области цифровых технологий, необходимых для эффективного дистанционного взаимодействия с пациентами. Преподаватели должны обладать навыками работы с телемедицинскими платформами и уметь обучать студентов основам виртуального консультирования, электронного мониторинга состояния пациента и использования медицинских информационных систем.

Кроме того, растущая потребность в междисциплинарных навыках, таких как понимание основ психологии, социальной работы и управления медицинскими учреждениями, также оказывает значительное влияние на кадровую политику. Современные образовательные стандарты требуют от преподавателей навыков интеграции знаний из смежных областей, что позволяет студентам получать более широкую подготовку, необходимую для комплексного подхода к лечению пациентов. Это, в свою очередь, требует от кадрового состава образовательных учреждений готовности к постоянному обучению и развитию междисциплинарных компетенций, что также влияет на кадровую политику. В Казахстане такие компетенции начинают учитываться в образовательных стандартах и программах повышения квалификации для медицинских преподавателей, что позволяет адаптировать кадровый состав к новым вызовам.

Значимость гибкости кадрового состава для оперативного реагирования на изменения в системе здравоохранения особенно проявляется в условиях глобальных кризисов, таких как пандемия COVID-19. Этот кризис выявил необходимость быстрых изменений в образовательных процессах, включая внедрение новых методов дистанционного обучения и пересмотр стандартов подготовки. Многие преподаватели были вынуждены оперативно освоить цифровые инструменты для проведения лекций и практических занятий в онлайн-формате, что показало важность гибкости и способности к адаптации. В ответ на это многие образовательные учреждения начали разрабатывать программы повышения квалификации для преподавателей, направленные на освоение цифровых компетенций и методов дистанционного взаимодействия [20].

Технологический прогресс и развитие дистанционного здравоохранения требуют от преподавателей освоения цифровых технологий и телемедицинских платформ, что повышает гибкость образовательных программ. Одновременно растет значимость междисциплинарных навыков, таких как психология и управление медицинскими учреждениями, что требует от преподавателей готовности к постоянному обучению и

адаптации своих компетенций. Глобальные кризисы, например, пандемия COVID-19, подчеркивают необходимость гибкости кадрового состава для быстрой реакции на изменения и поддержания качества подготовки медицинских специалистов в условиях кризиса.

Таблица 2 Влияние тенденций в здравоохранении на кадровую политику образовательных учреждений.

Тенденция	Анализ влияния на кадровую политику	Оценка влияния
Технологический прогресс	Технологические изменения требуют адаптации кадров к новым методам и подходам, включая работу с цифровыми инструментами и инновациями в лечении. Преподаватели должны быть подготовлены к использованию новых технологий в обучении медицинских специалистов.	Повышает качество подготовки специалистов, готовых к современным требованиям здравоохранения.
Развитие дистанционного здравоохранения	Рост дистанционных услуг требует от преподавателей знания телемедицинских платформ и цифровых технологий для эффективного взаимодействия с пациентами на расстоянии. Требует гибкости кадровой политики для адаптации преподавателей к новым цифровым форматам.	Увеличивает необходимость в цифровой грамотности среди преподавателей и адаптацию программ обучения под дистанционные форматы.
Рост потребности в междисциплинарных навыках	Необходимость в обучении студентов основам психологии, социальной работы и управлению медицинскими учреждениями требует, чтобы преподаватели обладали междисциплинарными знаниями. Это повышает требования к квалификации и компетенции преподавательского состава.	Усиливает подготовку к комплексному подходу в лечении пациентов и требует постоянного повышения квалификации преподавателей.
Необходимость гибкости кадрового состава	Глобальные кризисы, такие как COVID-19, подчеркивают важность гибкости преподавательского состава, готового быстро переходить на дистанционное обучение и адаптировать программы под новые реалии.	Позволяет образовательным учреждениям эффективно реагировать на вызовы и поддерживать непрерывное обучение в условиях кризиса.
Примечание: составлена на основе [16-20].		

Таким образом, кадровая политика образовательных учреждений здравоохранения должна строиться на принципах гибкости и адаптивности. Это позволит учебным заведениям эффективно реагировать на изменения в системе здравоохранения и

обеспечивать подготовку специалистов, соответствующих новым требованиям. Включение цифровых и междисциплинарных навыков в программы обучения для преподавателей позволит не только улучшить качество образования, но и подготовить кадры, готовые к работе в современных условиях, что особенно важно для развития здравоохранения в Казахстане и других странах.

Заключение. Результаты проведенного исследования подтверждают, что современная система здравоохранения требует от образовательных учреждений гибкости и оперативного обновления кадровой политики. Быстрое развитие технологий и значительное увеличение роли дистанционного здравоохранения предъявляют высокие требования к компетенциям преподавательского состава. Педагогам необходимо не только владеть базовыми медицинскими знаниями, но и обладать цифровыми навыками, чтобы эффективно внедрять и использовать современные инструменты обучения и взаимодействия с пациентами.

Междисциплинарные подходы, ориентированные на комплексное понимание психологии, социальной работы и управления медицинскими учреждениями, также усиливают подготовку выпускников к работе в сложной и динамично изменяющейся медицинской среде. Данные аспекты подчеркивают важность формирования кадровой политики, ориентированной на регулярное повышение квалификации и переподготовку преподавателей для поддержания их актуальных компетенций.

В условиях глобальных кризисов, таких как пандемия COVID-19, значимость гибкости кадрового состава становится еще более очевидной. Быстрая адаптация образовательных процессов к новым форматам обучения и изменениям в системе здравоохранения позволяет поддерживать качество подготовки медицинских специалистов даже в условиях неопределенности.

Исследование показывает, что кадровая политика, основанная на принципах гибкости и адаптивности, является ключевым фактором для устойчивого развития системы здравоохранения. Таким образом, включение цифровых и междисциплинарных компетенций в программы обучения преподавателей медицинских образовательных учреждений обеспечит высокое качество подготовки специалистов, соответствующих новым и будущим требованиям здравоохранения как в Казахстане, так и в других странах.

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Globalization 4.0 and the World Economy: Challenges and New Growth Models

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Abstract: The global economy is navigating a transformative period, characterized by unprecedented technological advancements and persistent systemic challenges. While the ongoing transition to Globalization 4.0 promises unparalleled opportunities for innovation and growth, it also underscores structural inequalities, environmental risks, and geopolitical complexities. This article explores the dominant trends shaping the global economy, contextualizing them within the historical evolution of globalization and technological progress. It further investigates the role of emerging technologies in fostering inclusive growth and sustainability while proposing actionable pathways to address these challenges.

Keywords: Industry 4.0, Globalization 4.0, Innovation, World Economy, Sustainable Development Goals.

The global economy is navigating a period of profound transformation, driven by rapid technological advancements and compounded by systemic challenges that test the resilience of existing economic structures. This juncture is marked by a precarious slowdown in growth, with global GDP projected to expand by a modest 2.5%. This tepid growth reflects the enduring impacts of geopolitical tensions, persistent supply chain disruptions, and widespread inflationary pressures (UNCTAD, 2023). Among the most significant contributors to these economic difficulties is the war in Ukraine, which has severely disrupted energy markets. The conflict has triggered inflationary surges across a range of essential commodities, including oil, natural gas, and agricultural products, intensifying economic uncertainty worldwide (Hossain, 2023). The cascading effects of these disruptions reverberate across global markets, amplifying vulnerabilities in both developed and developing economies.

Compounding these geopolitical shocks are the escalating risks posed by climate change. Increasingly frequent and severe climate-related events threaten food systems, disrupt global supply chains, and jeopardize the stability of economies that are heavily dependent on agriculture and natural resources. From droughts that reduce crop yields to floods that cripple infrastructure, these risks have made the need for resilient and sustainable economic models more urgent than ever.

Simultaneously, the global economy is undergoing a transition to a new phase of interconnectedness and technological transformation, often referred to as «Globalization 4.0». This phase is characterized by the integration of cyber-physical systems and the convergence of digital, physical, and biological spheres. Technologies such as artificial intelligence (AI), robotics, and genomics are at the forefront of this transformation, offering the potential to redefine industries, drive innovation, and significantly enhance economic growth (Amosha et al., 2021). However, these advancements are not without challenges. They highlight systemic inequalities between nations, exacerbate environmental vulnerabilities, and pose risks of workforce

displacement, particularly in economies that lack the infrastructure and resources to fully embrace these new technologies.

As the Fourth Industrial Revolution unfolds, these developments raise critical questions about the future of the global economy. Chief among them is how technological advancements can be harnessed to achieve inclusive and sustainable growth. Addressing this question requires a deep understanding of historical globalization trends, an analysis of contemporary economic challenges, and an evaluation of the transformative potential of emerging technologies. By examining these dimensions, this article aims to provide a comprehensive framework for navigating the complexities of Globalization 4.0 and fostering a balanced approach to growth that aligns innovation with equity and sustainability.

The trajectory of globalization has unfolded across distinct historical phases, each defined by transformative technological innovations and shifting economic paradigms. These phases provide crucial context for understanding the unique dynamics of Globalization 4.0 and its far-reaching implications for economic governance, equity, and sustainability.

Globalization 1.0: Laying the Foundations of Global Trade. The first phase of globalization, spanning from the late 15th to the late 19th centuries, emerged during the Age of Exploration. This period was marked by the establishment of trade networks connecting the Old and New Worlds. The voyages of explorers like Christopher Columbus and Vasco da Gama not only opened new trade routes but also laid the foundation for the global exchange of goods, cultures, and ideas. Economic activity during this era was propelled by the advent of transformative technologies such as the steam engine, developed during the First Industrial Revolution. Steam-powered machinery revolutionized production and transportation, facilitating industrialization and enabling the rapid expansion of trade routes.

However, the scope of globalization during this phase was constrained by significant regional disparities in industrial capacity and technological development. While industrialized nations leveraged their technological superiority to dominate global trade, much of the world remained peripheral to these economic networks. This imbalance underscored the nascent inequalities that would shape future phases of globalization (Moktadir & Ren, 2024).

Globalization 2.0: The Era of Mass Production and Integration. Globalization entered its second phase in the late 19th century, continuing through the mid-20th century. During this period they witnessed deeper economic integration driven by the technological breakthroughs of the Second Industrial Revolution. Innovations such as electricity, the internal combustion engine, and advancements in steel production laid the groundwork for mass production and industrial scaling. Multinational corporations began to emerge as dominant players in global trade, extending their operations across borders and transforming traditional trade patterns.

This phase also saw the establishment of key international organizations that formalized global economic governance. Institutions like the International Monetary Fund (IMF) and the World Bank were created to promote financial stability and economic cooperation, reflecting the growing interdependence of national economies. While these developments deepened global integration, they also institutionalized disparities in economic power, as industrialized nations often dictated the rules of international trade and finance (Hossain, 2023).

Globalization 3.0: The Digital Revolution and Global Value Chains. The third phase of globalization, spanning from the mid-20th century to the early 2010s, was defined by the digital revolution. This era introduced groundbreaking advancements in semiconductors, personal computing, and the internet, fundamentally reshaping global commerce and communication. These technologies enabled the liberalization of trade, fostering the development of global value chains that interconnected production processes across multiple countries.

The digital era democratized access to information and allowed smaller enterprises to participate in global markets. However, the benefits of technological advancements were

unevenly distributed and largely concentrated in advanced economies. Developing nations often lack the infrastructure, education systems, and financial resources necessary to fully capitalize on the opportunities presented by the digital revolution. As a result, structural inequalities were exacerbated, leaving many regions economically marginalized (Najar et al., 2024).

Globalization 4.0: A Multipolar and Technological Paradigm. Today, the global economy is experiencing a paradigm shift with the advent of Globalization 4.0, driven by the transformative forces of the Fourth Industrial Revolution. This phase is defined by the convergence of cyber-physical systems, artificial intelligence (AI), robotics, and genomics, which are reshaping economic activities and redefining the nature of work. Unlike earlier phases, which were characterized by dominance from specific regions or industries, Globalization 4.0 reflects an increasingly multipolar dynamic where innovation, talent, and digital integration are the primary drivers of growth.

Technologies like AI and robotics are automating processes, optimizing supply chains, and creating entirely new industries, while genomics is revolutionizing healthcare and agriculture. These advancements emphasize the importance of human capital; as skilled talent becomes a critical resource for economic competitiveness. At the same time, this phase highlights the need for inclusive governance frameworks that address systemic disparities and ensure equitable participation in the global economy (Insight Report, 2024)

The evolution of globalization underscores how technological innovation has consistently acted as a catalyst for economic integration and transformation. However, each phase has also revealed the challenges of inequality, governance, and adaptation. As the global economy transitions into this new era, understanding these historical trajectories is essential for navigating the opportunities and risks of Globalization 4.0.

The global economy is navigating an intricate web of challenges that collectively threaten its stability and hinder pathways to recovery. Among these issues, inflationary pressures and energy market volatility stand out as some of the most urgent concerns, amplified by geopolitical tensions and the lingering impacts of the COVID-19 pandemic. These interconnected problems highlight the fragility of the global economic system and its susceptibility to external shocks, requiring coordinated responses and long-term strategies for resilience (Cano-Marin et al., 2023).

Inflation has emerged as a pervasive global challenge, eroding consumer purchasing power and disproportionately affecting vulnerable economies. Fueled by disruptions in supply chains and heightened geopolitical tensions, inflationary spikes have driven up the costs of essential goods and services. Developing economies, in particular, bear the brunt of these pressures, as inflation rates often surpass those in advanced economies due to weaker economic buffers and limited fiscal resources (Caseau, 2024; Hossain, 2023). The Ukraine war has exacerbated these trends, severely disrupting supply chains for critical commodities such as wheat, oil, and fertilizers. These disruptions have further inflated global food prices, compounding the financial burden on households and increasing food insecurity in many regions (UNCTAD, 2023).

The rising costs of goods and services have created a feedback loop of economic distress. Businesses face higher production costs, which are often passed on to consumers, while governments struggle to implement effective monetary policies that balance inflation control with economic growth. The challenges are particularly acute in economies reliant on imports for food and energy, where currency depreciation has further amplified the impact of rising prices.

Energy market instability represents another significant threat to global economic stability. In Europe, natural gas prices in 2022 surged to six times their 10-year average, driven by supply disruptions linked to the Ukraine conflict. These price spikes have strained industrial production, increasing the costs of manufacturing and transportation, while also imposing a heavy financial burden on households reliant on gas and electricity for heating and power. The ripple effects of these price increases extend beyond Europe, impacting energy-dependent regions such as South

Asia and Sub-Saharan Africa, where socio-economic vulnerabilities are magnified by limited access to affordable energy sources (Moktadir & Ren, 2023).

Developing economies face heightened instability as they often lack the fiscal capacity to implement mitigating measures such as subsidies or price controls. In many cases, governments are forced to divert resources away from long-term development projects to address immediate energy crises, slowing economic progress and exacerbating inequality. For regions dependent on energy imports, the global competition for liquefied natural gas and other fuels has intensified, leading to resource shortages and increased production costs across industries.

The global economy's challenges are further compounded by deep-seated structural inequalities, which limit the ability of many nations to respond effectively to crises. A lack of access to advanced technologies and insufficient investment in digital infrastructure significantly hinder developing nations from participating fully in the global economy. While Industry 4.0 technologies, such as artificial intelligence (AI), robotics, and the Internet of Things (IoT), have demonstrated their potential to drive innovation and productivity, their adoption remains uneven. Advanced economies, with greater resources and robust digital ecosystems, continue to dominate the technological landscape, reinforcing existing disparities (Amosha et al., 2021; Cicchiello et al., 2024; Mhlanga, 2021).

For developing economies, the barriers to adopting these technologies are manifold. Insufficient investments in education and workforce reskilling, coupled with inadequate infrastructure, prevent these nations from leveraging the transformative potential of Industry 4.0. This technological divide not only slows economic progress but also widens the gap between developed and developing nations, undermining global efforts toward equitable growth.

Climate change and environmental degradation add another layer of complexity to the global economic landscape. The increasing frequency and severity of extreme weather events—such as droughts, floods, and hurricanes—pose significant risks to food systems and natural resources. These disruptions have led to reduced agricultural yields, exacerbated food scarcity, and driven up prices for essential commodities, further straining vulnerable populations (Hassoun et al., 2022; Mabkhot et al., 2021).

The economic consequences of climate-related disruptions are particularly severe for nations heavily reliant on agriculture and natural resources. Infrastructure damage caused by extreme weather events often requires substantial financial resources to repair, diverting funds from other critical areas such as education, healthcare, and technological development. Addressing these challenges demands significant investments in renewable energy, sustainable agricultural practices, and climate-resilient infrastructure. Moreover, international cooperation is essential to provide financial and technological support to regions disproportionately affected by climate change.

The interplay between inflationary pressures, energy market volatility, structural inequalities, and climate-related risks underscores the interconnected nature of the global economy. These challenges do not operate in isolation; rather, they reinforce one another, creating a feedback loop that intensifies their collective impact. For example, rising energy prices increase production costs, which feed into inflation, while climate-related disruptions exacerbate food insecurity and resource scarcity.

Navigating this complex web of challenges requires a coordinated global response that addresses both immediate crises and long-term structural issues. Policymakers must adopt a holistic approach that integrates economic, social, and environmental priorities, ensuring that efforts to stabilize the global economy also promote equity and sustainability. Only through collaborative and forward-thinking strategies can the global community mitigate these risks and pave the way for a more resilient and inclusive economic future.

Emerging technologies lie at the core of Globalization 4.0, offering transformative opportunities to redefine industries, drive economic growth, and address global challenges such as sustainability and resource management. These technologies, including artificial intelligence (AI), robotics, cyber-physical systems, genomics, and biotechnology, are reshaping traditional economic models and creating pathways for innovation and productivity. Their widespread adoption marks a paradigm shift in the way industries operate, enabling higher efficiency, cost reduction, and sustainability.

Artificial intelligence has emerged as a critical driver of innovation in numerous sectors. With its ability to process vast amounts of data and identify patterns, AI-powered predictive analytics are optimizing supply chain management, enhancing decision-making processes, and reducing operational inefficiencies. For instance, companies can use AI algorithms to forecast demand, manage inventory more effectively, and respond to supply chain disruptions in real-time. These capabilities not only enhance efficiency but also contribute to the resilience of global trade networks (Andronie et al., 2021).

Robotics, on the other hand, has revolutionized manufacturing processes by automating repetitive tasks, increasing precision, and reducing human error. Advanced robotics systems are particularly effective in industries such as automotive, electronics, and healthcare, where precision and reliability are paramount. By improving productivity and lowering costs, robotics enables businesses to remain competitive in a rapidly evolving global market. Furthermore, the integration of AI and robotics in smart factories allows for greater flexibility in production, enabling manufacturers to adapt to changing consumer demands with minimal downtime.

In the healthcare sector, genomics and biotechnology are driving breakthroughs that promise to improve patient outcomes and reduce costs. Precision medicine, which tailors treatments to an individual's genetic profile, is transforming the way diseases are diagnosed and managed. By identifying genetic predispositions and targeting therapies more effectively, precision medicine minimizes trial-and-error approaches, reduces treatment costs, and enhances the overall quality of care. This approach is particularly valuable in managing chronic diseases such as cancer and diabetes, where personalized interventions can significantly improve survival rates and quality of life (Hassoun et al., 2022).

In agriculture, biotechnological innovations are addressing critical challenges related to food security and climate resilience. Drought-resistant crops, developed through advanced genetic engineering, enable farmers in arid regions to maintain yields despite water scarcity. Similarly, pest-resistant and nutrient-enriched crops reduce reliance on chemical fertilizers and pesticides, promoting more sustainable farming practices. These advancements are crucial for regions heavily impacted by climate change, where traditional agricultural methods are no longer viable (Mhlanga, 2021).

While the benefits of Industry 4.0 technologies are substantial, their integration into the global economy presents significant challenges. One of the most pressing concerns is the potential for workforce displacement caused by automation. Low-skilled jobs, particularly those involving routine or repetitive tasks, are at high risk of being replaced by machines. This shift necessitates proactive workforce reskilling and upskilling initiatives to prepare individuals for roles that require higher levels of technical expertise and adaptability.

Another major challenge is the uneven adoption of these technologies, which often favors advanced economies. Wealthier nations with well-established digital infrastructures and significant investments in research and development are better positioned to leverage Industry 4.0 technologies. In contrast, developing nations face barriers such as limited access to capital, inadequate technological infrastructure, and insufficient expertise. These disparities risk widening the global economic divide unless targeted measures are implemented to promote inclusive access and capacity building (Khan et al., 2021; Mabkhot et al., 2021).

To maximize the benefits of emerging technologies while mitigating their risks, a balanced approach is essential. Policymakers must prioritize investments in education and training programs that equip the workforce with the skills needed to thrive in a technology-driven economy. Additionally, international cooperation is crucial to ensure that developing nations receive the financial and technical support required to adopt these technologies effectively. This includes initiatives to expand digital infrastructure, promote knowledge sharing, and foster public-private partnerships that drive innovation across borders.

By addressing these challenges proactively, the global community can harness the transformative potential of AI, robotics, genomics, and other technologies to foster a more inclusive and sustainable economic future. These advancements, while not without risks, represent a unique opportunity to reshape industries, improve quality of life, and tackle some of the world's most pressing challenges. However, realizing this potential requires a commitment to equity, collaboration, and forward-thinking policy design.

The integration of emerging technologies into global industries is not only transforming production processes but also driving significant strides toward sustainability. Industry 4.0 technologies such as AI, robotics, and IoT have enabled the adoption of circular economic models that prioritize resource efficiency and waste reduction. By extending the lifecycle of resources, these innovations not only mitigate environmental impact but also create economic value, setting a new standard for sustainable industrial practices. For example, in the plastics and textile industries, smart manufacturing systems have revolutionized material recovery and reuse, significantly improving efficiency while reducing waste. These advancements establish benchmarks that other sectors are beginning to emulate, paving the way for more sustainable global production systems (Khan et al., 2021; Nara et al., 2021).

While the benefits of these advancements are undeniable, they come with environmental costs that demand careful consideration. The rapid pace of technological progress has led to challenges such as the generation of electronic waste (e-waste) and the high energy consumption associated with data centers and digital infrastructure. E-waste, which includes discarded electronic devices and components, is growing at an alarming rate. Improper disposal of these materials not only leads to environmental contamination but also wastes valuable resources that could be recycled or repurposed.

Data centers, which form the backbone of the digital economy, are another significant contributor to environmental concerns. These facilities require vast amounts of energy to operate and cool their servers, making them major sources of greenhouse gas emissions. As the demand for cloud computing, AI, and IoT applications continues to grow, so does the environmental footprint of data centers. Without effective strategies to improve energy efficiency and transition to renewable energy sources, these impacts will only intensify.

To address these challenges, policies promoting the adoption of clean technologies and sustainable practices are essential. Governments and international organizations must implement regulations that encourage industries to prioritize environmental stewardship. This includes providing incentives for adopting green technologies, such as tax breaks for companies investing in renewable energy or developing sustainable supply chains. By aligning financial benefits with environmental goals, policymakers can drive widespread adoption of sustainable practices across sectors.

Furthermore, international cooperation is critical for ensuring that developing economies have access to the financial and technological resources needed to adopt sustainable practices effectively. Many low- and middle-income countries lack the infrastructure and capital necessary to transition to cleaner technologies, making global partnerships indispensable. Initiatives such as technology transfer agreements, international funding mechanisms, and knowledge-sharing

platforms can help bridge this gap, enabling these nations to participate in and benefit from the global shift toward sustainability.

The principles of the circular economy provide a robust framework for addressing the environmental challenges posed by technological progress. Unlike traditional linear economic models, which emphasize consumption and disposal, circular economies focus on extending the lifecycle of products through recycling, repurposing, and remanufacturing. Industry 4.0 technologies play a pivotal role in implementing these practices. IoT sensors and AI-driven analytics can monitor resource usage in real-time, identifying opportunities for waste reduction and process optimization. Robotics and automation further enhance efficiency by enabling precise sorting and recycling of materials, reducing contamination, and improving the quality of recovered resources.

In sectors such as plastics and textiles, these approaches have already demonstrated significant potential. Smart manufacturing systems enable closed-loop production processes, where waste materials are reintegrated into the supply chain as raw materials. For example, recycled plastic can be used to produce new packaging, while discarded textiles can be transformed into fibers for creating new garments. These practices not only reduce environmental impact but also create new economic opportunities by turning waste into valuable resources (Khan et al., 2021; Nara et al., 2021).

Ultimately, achieving sustainability in the era of Globalization 4.0 requires a coordinated, multi-stakeholder approach that integrates technological innovation with environmental responsibility. Policymakers, businesses, and international organizations must work together to develop and implement solutions that address the environmental costs of technological progress while leveraging its potential to drive sustainable growth. Investments in renewable energy, improvements in resource efficiency, and the adoption of circular economic practices are critical components of this effort.

By embracing these strategies, the global economy can mitigate the environmental challenges of technological advancement and ensure that the benefits of Industry 4.0 extend to future generations. The path forward lies in balancing the opportunities offered by emerging technologies with a commitment to environmental stewardship, creating a more sustainable and equitable global economy.

Realizing the transformative potential of Globalization 4.0 requires addressing its inherent risks through robust governance frameworks and coordinated global action. As technologies such as AI, robotics, and cyber-physical systems reshape industries, they also amplify challenges such as workforce displacement, technological inequality, and environmental sustainability. These issues demand inclusive policies that balance innovation with equity, ensuring that the benefits of technological advancements are widely shared.

To bridge the digital divide, inclusive policies must focus on expanding access to Industry 4.0 technologies in under-resourced regions. Public-private partnerships play a pivotal role in this effort, offering a platform for pooling resources, expertise, and innovation. For instance, collaborative initiatives between governments, corporations, and international organizations can fund digital literacy programs, enhance internet connectivity, and create affordable access to advanced technologies. By empowering individuals and businesses in developing regions, these efforts can foster participation in the global economy while reducing systemic inequalities (Goralski & Tan, 2020; Mabkhot et al., 2021).

Additionally, financial mechanisms such as low-interest loans or grants for technology adoption can help underprivileged nations build the infrastructure needed for Industry 4.0. These measures can create a ripple effect, enabling local businesses to integrate into global supply chains and stimulating economic growth at the grassroots level.

The current structures of global economic governance must evolve to reflect the realities of a multipolar world. Institutions such as the International Monetary Fund (IMF) and the World Trade Organization (WTO), while instrumental in fostering economic stability, often disproportionately favor advanced economies. To address this imbalance, reforms are needed to ensure more equitable representation for emerging economies. This includes revising voting mechanisms and decision-making processes to provide greater influence to nations from the Global South.

Reforming trade policies is another critical step. Reducing protectionism and fostering open markets can facilitate the integration of developing nations into global value chains. Special provisions for emerging economies, such as reduced tariffs or technology-sharing agreements, can enable them to participate more effectively in international trade. Establishing global standards on intellectual property rights, data sharing, and access to emerging technologies is equally important. These measures can prevent monopolistic practices and ensure that technological advancements are accessible to all nations (Andronie et al., 2021; Mabkhot et al., 2021).

As automation and AI reshape the job market, investments in education and workforce development are paramount. Governments must prioritize education systems that equip individuals with the skills needed for a technology-driven economy. This includes not only technical skills such as coding and data analysis but also soft skills like critical thinking, creativity, and adaptability.

Workforce reskilling programs are essential for individuals displaced by automation. For instance, partnerships between governments and private sector organizations can offer subsidized training programs, apprenticeships, and online courses tailored to industry needs. These initiatives should focus on empowering marginalized groups, such as women and low-income workers, to ensure inclusivity in the economic benefits of Globalization 4.0.

Establishing robust social safety nets can further mitigate the impacts of economic disruptions on vulnerable populations. Unemployment benefits, universal healthcare, and housing support can provide a cushion for those affected by workforce displacement, enabling them to transition to new opportunities with greater security (Hassoun et al., 2022; Khan et al., 2021).

Climate change poses one of the greatest threats to global economic stability, and addressing it requires an integrated approach that aligns technological innovation with environmental objectives. Investments in renewable energy infrastructure are essential, particularly in developing economies where reliance on fossil fuels remains high. Expanding access to clean energy technologies such as solar panels, wind turbines, and battery storage systems can reduce greenhouse gas emissions while fostering energy independence.

Circular economy policies, which emphasize recycling, repurposing, and minimizing waste, offer a sustainable alternative to traditional linear economic models. Industry 4.0 technologies such as IoT sensors and AI-driven analytics can optimize resource use and monitor environmental impacts in real time. By integrating these tools into manufacturing and agriculture, businesses can achieve higher efficiency while reducing their ecological footprint.

Advancements in green technologies, such as carbon capture systems and bio-based materials, also hold promise for mitigating climate change. Governments can incentivize the adoption of these innovations through tax credits, subsidies, and research grants. Moreover, international cooperation is crucial to support developing nations in adopting sustainable practices. Technology transfer agreements and global climate funds can provide the financial and technical resources needed to build climate-resilient infrastructure and reduce vulnerabilities (Hassoun et al., 2022; Mabkhot et al., 2021).

To ensure that the benefits of Globalization 4.0 are equitably distributed, policymakers must adopt a holistic approach that integrates economic, social, and environmental priorities. Collaborative governance mechanisms that involve stakeholders from governments, industries,

and civil society are essential for designing inclusive policies. These frameworks should prioritize transparency, accountability, and the active participation of marginalized groups.

In summary, achieving the potential of Globalization 4.0 while addressing its risks requires a concerted effort to reform governance structures, invest in education, and promote sustainability. By fostering international cooperation and aligning technological innovation with equity and environmental goals, the global community can create a resilient and inclusive economic system that benefits all.

The global economy is undergoing a profound transformation as it navigates the complexities of Globalization 4.0. This phase, driven by the Fourth Industrial Revolution, offers unparalleled opportunities for innovation, productivity, and sustainability. However, it also presents significant challenges, including systemic inequality, workforce displacement, and environmental degradation. Addressing these issues is essential to ensure that the benefits of this transformation are equitably distributed and aligned with long-term global stability.

To achieve these goals, a comprehensive and collaborative approach is required, underpinned by visionary leadership and robust policy frameworks. The following recommendations outline key strategies for navigating this complex landscape:

1. Foster Inclusive Technological Adoption

Governments and international organizations must work together to bridge the technological divide between advanced and developing economies. Investments in digital infrastructure, particularly in under-resourced regions, are critical to enable broader participation in the global economy. Initiatives such as public-private partnerships can play a crucial role in funding these developments, ensuring that even the most vulnerable nations have access to transformative technologies.

2. Prioritize Workforce Reskilling and Social Safety Nets

Automation and AI-driven changes in industries are inevitable, but they must be accompanied by robust workforce reskilling programs. Governments should prioritize education systems that emphasize digital literacy, critical thinking, and adaptability to prepare workers for the evolving job market. Additionally, social safety nets must be strengthened to provide security for those displaced by technological advancements, ensuring a smoother transition to new economic opportunities.

3. Enhance Global Governance Frameworks

The existing structures of global economic governance need reform to reflect the realities of a multipolar world. Developing nations should have greater representation in decision-making processes at international institutions such as the IMF and WTO. This inclusivity will build trust, foster cooperation, and ensure that policies reflect the needs of a diverse global community.

4. Invest in Sustainability and Climate Resilience

Climate change is one of the most pressing challenges of our time, and addressing it requires collective global action. Investments in renewable energy, green infrastructure, and sustainable practices must be prioritized. Governments should incentivize circular economic models that reduce waste and promote the efficient use of resources. Additionally, international collaboration on climate policies is essential to mitigate risks and support regions disproportionately affected by environmental challenges.

5. Promote Fair and Open Trade Policies

Trade remains a cornerstone of economic growth, but protectionist policies threaten to undermine global cooperation. Revisiting trade agreements to reduce barriers and foster equitable market access is essential. Developing nations should be integrated into global value chains, allowing them to benefit from the opportunities presented by Globalization 4.0.

6. Support Innovation with Ethical Oversight

While innovation is the engine of Globalization 4.0, it must be pursued responsibly. Governments and businesses should establish ethical guidelines for the development and deployment of technologies such as AI and biotechnology. These frameworks should address concerns around privacy, data security, and equitable access to ensure that technological advancements serve humanity as a whole.

In envisioning the path forward, it is clear that the success of Globalization 4.0 depends on a delicate balance between innovation and inclusivity. Policymakers must adopt a forward-looking approach that aligns economic strategies with environmental sustainability and social equity. The Fourth Industrial Revolution offers humanity an opportunity to redefine global economic interactions in ways that are more resilient, inclusive, and sustainable.

Ultimately, the future of the global economy hinges on the ability to embrace collaboration, prioritize long-term goals, and address systemic challenges with courage and vision. By taking decisive action today, the global community can ensure that the transformative potential of Globalization 4.0 translates into shared prosperity and a brighter future for all.

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ҚАЗАҚСТАННЫҢ ҚОНАҚ ҮЙ ҚЫЗМЕТІНДЕ ЗАМАНАУИ ТЕХНОЛОГИЯЛАРДЫ ПАЙДАЛАНУДЫ ТАЛДАУ

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Аңдатпа. Бұл мақалада қонақжайлылық индустриясында заманауи технологияларды қолдану мен интернетті қолданудың маңыздылығы мен тәжірибесі туралы түсінік береді. Сонымен қатар технологиялық инновациялар мен ақпараттық жүйелер қонақ үй компаниялары үшін қалай пайдалы болатындығын көрсетуге бағытталған. Қазіргі заманғы технологияларды енгізу Қазақстанның қонақжайлық және туризм салаларында өзекті мәселе болып қала береді. Сондықтан қонақжайлық индустрияда технологиялардың дамуына нақты баға беру және бақылау маңызды. Аталған мәселелер мақаланың өзектілігін, оның мақсатын негіздейді. Зерттеу жұмысы кешенді және жүйелі талдау қағидаларына негізделе отырып, экономикалық талдау, статистикалық талдау, салыстыру, бағалау секілді әдістерінің көмегімен жүргізілді.

Түйін сөздер: қонақ үй, қонақжайылылық, туризм, инновация, технология

Кіріспе. Заманауи технологиялар - біздің қазіргі қоғамымызда өте кең таралған құбылыс. Бұл сала әлемді өзгертті және одан әрі қайта құруда шешуші рөл атқарады. Компьютерлер мен заманауи технологиялар болмаса, бұл құбылыс мүмкін болмас еді. Олар экономикадағы, тарихи прогрестегі, сондай-ақ әлеуметтік саладағы көптеген процестерге әсер етеді.

Бүгінгі таңда туристік қызметтер нарығының жұмыс істеуі қазіргі заманғы ақпараттық технологияларды пайдаланбай мүмкін емес.

Бұл қазіргі заманғы ақпараттық технологиялардың пайда болуы туризм саласында халыққа қызмет көрсетудің жаңа бағыттарының пайда болуына әкеледі.

Интернеттегі қабылданған анықтамаға сәйкес, заманауи технологиялар — бұл компьютерлік технологиялар мен ұйымдастыру әдістерін қолдана отырып, ақпаратты өңдеумен және сақтаумен айналысатын адамдардың еңбегін тиімді ұйымдастыру әдістерін зерттейтін өзара байланысты ғылыми, технологиялық, инженерлік ғылымдардың жиынтығы, адамдармен және өндірістік жабдықтармен өзара әрекеттесу, оларды практикалық қолдану және соған байланысты әлеуметтік, экономикалық және мәдени мәселелер.

Экономиканы цифрландыру - бұл қазіргі заманғы технологияларды үлкен маңызы бар экономикалық дереккөзге айналдыру. Заманауи технологиялар біздің өмірімізде маңызды орын алады және экономикалық даму, еңбек өнімділігінің сандық өсуі, әлеуметтік-экономикалық проблемаларды шешу және экономикалық қатынастардың жаңа түрін құру үшін айтарлықтай жаңа мүмкіндіктер ашады.

Қонақ үй бизнесі - бұл үнемі қозғалатын және дамитын динамикалық орта. Әлемдегі ең ірі салалардың бірі ретінде мейрамхана сатылымы бизнес иелері үшін өте тиімді нарық болып табылады. Алайда, үлкен мүмкіндіктер үлкен бәсекелестікті де білдіреді. Қазіргі заманғы қонақ үй компаниялары салауатты ұзақ мерзімді клиенттік базаны тарту және

қолдау үшін шығармашылыққа бейімделуі керек. Клиенттердің оң тәжірибесін керемет қызметтер мен оңтайландырылған операциялар қолдауы керек. Заманауи технологиялар қонақ үй бизнесі үшін процестерді жеңілдетуде маңызды рөл атқарады. Тапсырыс киосктардан бастап смартфондардағы қонақүйлерді тіркеу құралдары мен тамақ өнімдерін жеткізуге арналған қосымшаларға дейін қонақ үй компаниялары бәсекелестік артықшылыққа ие болу үшін бірнеше технологиялық тактикаларды қолданады.

Қонақжайлылық индустриясында жаңашылдар көбінесе олардың тапқырлығына және әртүрлі тұжырымдамаларды құру және жүзеге асыру процесіне тікелей қатысуға негізделген. Негізгі критерий ретінде сәтті және сәтсіз инновациялық жобаларды ажырататын инноватордың болуы қарастырылады.

Талқылау және нәтижелер. Қазақстандағы қонақжайлылық индустриясы Орталық Азия елі ретінде үлкен әлеуетке ие. Қазақстанда осы саланың тұрақты дамуы даму үстінде. Алайда, кейбір кедергілер осы саланың жалпы даму әлеуетіне кедергі келтіретін сияқты. Мұндай кедергілерді еңсеруге Қазақстанның қонақжайлық индустриясындағы цифрлық инновациялар мен көптеген интернет-платформалардың қолдауымен ішінара қол жеткізуге болады. Көптеген елдерде бұл сала заманауи технологияларды тиімді қолдануға сәйкес айтарлықтай дамуды бастан өткерді. Бұл қосымшалар бірнеше секунд ішінде миллиондаған әлеуетті туристерге тауарлар мен қызметтерді ұсынуға мүмкіндік береді.

Туристер онлайн-платформаларда ұсынылатын туристік өнімдер мен қызметтерге қатысты таңдау жасай алады. Технологияны қолдана отырып, қағазды пайдалану азаяды, бұл оны экологиялық таза және мақсатқа жетуге төзімді етеді. Заманауи технологияларды қолдану қонақжайлылық индустриясының дамуын ерекше түрде қолдайды. Осылайша, бірнеше туристік бизнес кәсіпорындары жергілікті және жас қауымдастықтармен өзара әрекеттесуді дамыды. Мұндай өзара іс-қимыл біртіндеп инновациялық технологиялардың қолдауымен қалалық және ауылдық жерлерде жұмыс орындарын құруға және кедейлікті азайтуға әкеледі.

Қазақстан Республикасының Туризм және спорт министрлігінің қазіргі «Туризм индустриясы комитеті» елдегі туризмді ілгерілету және дамыту үшін цифрлық технологияларды қолданудың пайдалы бағыттарын ұсынуы мүмкін. Акционерлік Қоғам «Kazakh Tourism» Ұлттық Компаниясымен ынтымақтаса отырып, Youtube каналында Қазақстанның туристік индустриясын брендтеу және құру бойынша бірнеше бағдарламаларға бастама жасады.

Теориялық тұрғыдан алғанда, Туризм индустриясы комитеті де, «Kazakh Tourism»-де өздерінің барлық қонақ үйлерінде туристерге арналған онлайн-сервистерді қамтамасыз етуге ұмтылады, оларға брондау, төлем жасау және веб-сайттарын жаңарту кіреді. Туризм индустриясы комитеті туристер үшін 2019 жылы «kazakhstan.travel» ұлттық жобаны жүзеге асырды, олар біздің елмен және демалу мүмкіндіктерімен таныса алады. 2020 жылы олар «eHotel» жобасын жүзеге асырды, онда қонақтар туралы және олардың орналасқан жерлерінде болуы туралы мәліметтер бар (1 сурет).

Сурет 1 - «eQonaq» мобильді қосымшасы.

1-кестеде «eQonaq» инновациялық жүйенің 31 шілде 2021 ж. бастап 31 желтоқсан 2021 ж. дейінгі жағдайы бойынша мәліметі көрсетілген.

Кесте 1 - «eQonaq» жүйесінің көрсеткіштері

Күні	Туристерді есепке алатын қонақ үйлер, жатақханалар және демалыс үйлер саны	Тіркелген туристер саны
31.07.2021	697	36 343
31.08.2021	781	41 283
31.09.2021	1103	52 892
31.10.2021	1208	67 913
31.11.2021	1285	82 072
31.12.2021	1439	96 684
Ескертпе – Мәліметтер автормен құрастырылған		

«Eqonaq» жүйесінің көрсеткіштері негізінде 1-кестеде тұратын туристердің деректерін есепке алатын орындардың пайызы қалай өскенін көруге болады, 2021 жылғы 31 шілдеден 31 желтоқсанға дейін пайыз 106% - ға өсті.

Пандемия басталғаннан бері қонақжайлылық индустриясы біршама қиындықтарға тап болды, шекаралар жабылды, туристер ағыны тоқтады, қонақ үйлерде тұру аз болды, мейрамханалар, кафелер мен тамақтану орындары жабылып, кәсіпкерлер үлкен шығындарға ұшырады. Біртіндеп, кейбір тыйымдар алынып тасталғаннан кейін бәрі әдеттегі бағытқа қарай дами бастады, ал адамдар шетелге шығуды тоқтатқаннан кейін ішкі туризм артықшылық алды. Шектеу шараларына байланысты адамдар жергілікті демалыс түрлерін таңдай бастады.

Қазақстандық кәсіпкерлер туризм индустриясының ішкі ресурстарын белсенді дамыта бастады, туристік қызметтердің сапасы мен қол жетімділігін арттырды, заң талаптарына және пандемия жағдайларына сәйкес келетін жаңа қызметтер жасады. Біздің кәсіпкерлер әлемдегі қазіргі жағдайға бейімделе алды және бұл жаңа технологияларды енгізуге ықпал етті. Мысалы, COVID-19 жағдайындағы шектеу шараларына және көптеген мекемелер мен қонақ үйлердегі қонақтармен шектеулерге байланысты байланыссыз төлем жүйелері, QR коды бойынша байланыссыз мәзір әзірленіп, енгізілді, бұл пандемия кезінде де жұмыс істеуге мүмкіндік берді.

Мейрамхана мәзірін QR-код бойынша сканерлеу ғана қажет және автоматты түрде сілтеме ашылады, тағамдарды таңдап, оларды алдын ала интернет-банкинг жүйелері арқылы төлеуге болады. QR-код бойынша мәзір вирустар мен бактериялардың таралуына жол бермейді, сонымен қатар даяшылардың міндеттерін жеңілдетеді және даяшының келуін күтпей-ақ қонақтардың уақытын үнемдейді. Сондай-ақ, бұл технология қызметті, кірісті жақсартуға және клиенттердің адалдығын арттыруға мүмкіндік береді. Бұл бәсекеге қабілетті болуға көмектеседі. Мысалды 2-ші суретте көруге болады.

Сурет 2 - Сандық мәзірге кіру үшін QR жүйесін пайдалану мысалы.

Қонақ үй бизнесі - Қазақстанда қарқынды дамып келе жатқан сала, ол қонақтардың күткеніне сәйкес үнемі өзгеріп отырады. Нәтижесінде инновацияларға көп көңіл бөлінеді. Қонақ үй иелері мен операторлары үнемі қонақтардың өзгеріп отыратын қажеттіліктерін қанағаттандыра алатын және тіпті болжай алатын жаңа өнімдерді іздейді.

Қонақжайлылық индустриясындағы соңғы жаңалықтар және қонақүйлерді қалай анықтайтынымыз және таңдағанымыз бірнеше факторларға байланысты болды. Заманауи инновациялар, соның ішінде мобильді брондау, тіркеу, төлем жасау және нөмірлерге қызмет көрсету, әсіресе жас буын арасында, саяхатшылардың арасында танымал болды. Кез келген жерде және кез келген уақытта жеңіл онлайн-қолжетімділік тұжырымдама мен қабылдау қажеттілігін, қонақ үй қызметтерінің басқа да аспектілерін өзгерткен және Қазақстандағы қонақ үй бизнесінің ажырамас бөлігіне айналған стандартқа айналды. Ішкі нарық тәжірибесі көрсетіп отырғандай, интернет-маркетингтің қолжетімділігі бәсекелестіктің күшеюіне және бөлмелерге бағаның қысымына алып келді. Сонымен қатар, брондау сайттары мен онлайн-туристік агенттіктердің пайда болуымен клиенттерді қонақ үйлерге жеткізу құны айтарлықтай өзгерді, олар үлкен ақы алуы мүмкін. Интернеттегі туристік агенттіктер мен технологиялардың арқасында бүгінгі тұтынушылар он жыл бұрынғыға қарағанда күрделі және білімді бола бастады. Көптеген қонақтар үшін саяхат кезінде жақсы көңіл-күй тұжырымдамасы қазіргі заманғы саяхаттың ажырамас элементіне айналды.

Қазақстандық қонақүйлер денсаулық пен сауықтыру функцияларын қонақ үй дизайнына және бөлмелердің ерекшеліктеріне біріктіру арқылы жауап береді. Жайлылықты арттыратын әртүрлі дизайн элементтері қонақ бөлмелері интерьерінің бөлігі болып табылады. Көптеген қонақтар үшін саяхат кезінде жақсы көңіл-күй тұжырымдамадан қазіргі заманғы саяхаттың ажырамас элементіне айналды. Қонақүйлер денсаулық пен сауықтыру функцияларын қонақ үй дизайнына және бөлмелердің ерекшеліктеріне біріктіру арқылы жауап берді. Жайлылықты арттыратын әртүрлі дизайн элементтері қонақ бөлмелері интерьерінің бөлігі болып табылады.

Туристер «тұтынушыларға» айналды және қазір өз әлеуметтік тәжірибелерін құруға арналған технологиялық құралдарға ие. Бұл кәсіпорындарды, сондай-ақ туристік бағыттарды туристік әсерлердің жаңа дәуіріне бейімделуге мәжбүр етті. Инновациялық технологиялар туристік тәжірибені «делдал етті», өйткені олар біз баратын жерлерді қалай түсінетінімізді өзгертті және біздің тәжірибемізді оның үш кезеңінде (сапарға дейін, кезінде және одан кейін) әлеуметтік тұрғыдан қалыптастырады.

Кейбір жаңа технологиялар тәжірибе алмасуда шешуші рөл атқарды, өйткені олар пайдаланушылар, компаниялар және тағайындалған елдер арасында кең таралды. Әлеуметтік медиа - көптеген мысалдардың бірі. Олар түсініктемелер, фотосуреттер мен бейнелер, сондай-ақ басқа пайдаланушы мазмұны арқылы басқалармен жеке тәжірибе алмасуды белсенді қолдайды. Пайдаланушылар осы бұқаралық ақпарат құралдарында әлеуетті тұтынушыларға басқа уәждерден тығыз және тұрақты әлеуметтік байланыстарды сақтауға көмектесу үшін өз тәжірибелерімен бөліседі. Бұл саладағы өзгерістердің екінші маңызды факторы мобильді технологиялар болды.

Смартфондар туризмнің дамуына үлкен үлес қосты, бұл туристерге өздерін жақсы сезінуге, ақпараттандыруға және жоғары құндылықты алуға көбірек көңіл бөлуге мүмкіндік берді. Осы құрылғыларда қолдау көрсетілетін кеңейтілген шындық қосымшалары мен мобильді қосымшалар туристердің тәжірибесін жақсарта алады. Бұл екі аспект туристік тәжірибе мен инновациялық технологияларды зерттеуде өте маңызды: тәжірибе алмасудағы технологиялық делдалдық және технологиялар арқылы бірлесіп тәжірибе құру. Екі ағымның бірігуі «технологияның кеңейтілген тәжірибесі» пайда болды, жақында алдыңғы қатарлы интеллектуалды технологиялардың пайда болуымен және олардың тәжірибеге әсерімен зерттеулерде біріктірілген жаңа теориялық тәсіл пайда болды.

Қазақстандық тәжірибе бүгінде қонақжайлылық пен туризм индустриясындағы клиенттермен қарым-қатынасты басқарудың негізгі мақсаты клиент пен қонақ үй компаниясы арасында өзара тиімді қарым-қатынас орнату болып табылатынын көрсетіп отыр. Мұндай қарым-қатынастың маңыздылығы қонақүйге жаңа клиентті тарту қиындай түсетіндігімен анықталады. Клиенттердің қажеттіліктерін зерттеу және олардың өзгеруіне тез әрекет ету процесі көптеген сәтті қонақ үй корпорацияларының жоғары мақсаттарына қол жеткізуге негіз болды. Клиенттермен қарым-қатынасты басқарудың дамуындағы ең күшті тенденциялардың бірі-барлық тұтынушылардың қажеттіліктерін қанағаттандырудан әр клиенттің қажеттіліктерін қанағаттандыруға бағытталған толыққанды қатынастар мен тұтынушы желілерін құруға баса назар аудару. Бұл процесс ең алдымен қонақ үй компаниясы үшін де, клиент үшін де ұзақ мерзімді өзара тиімді ынтымақтастыққа бағытталған.

Туризм және қонақ үй бизнесі жұмыспен қамтуды реттеушілердің бірі болып табылады. Жыл сайын бұл салада 3 миллионға жуық жұмыс орны құрылады. Мысалы, туризмге Еуропалық Одақтың еңбек нарығының 13% келеді. Халықаралық еңбек ұйымының (ХЕҰ) мәліметтері бойынша, жаһандық туризм жүйесінде 130 миллионнан астам адам жұмыс істейді және мұнда бір жұмыс орнын құру экономиканың өнеркәсіптік секторына қарағанда шамамен 20 есе арзан.

Бүкіл әлемде туристік бизнесті оқытуға көп көңіл бөлінеді. Туристік бизнес үшін білікті кадрлар мәселесі өте маңызды, өйткені туризмде тұтынушыға ұсынылатын өнім өнім емес, қызмет болып табылады.

Туристік қызметтердің сапасын қамтамасыз ету осы қызметтерді көрсететін мамандардың кәсібилігімен, туристік ресурстарды білумен және олардың сапасымен тікелей байланысты. Бұл қызметті ұсынатын менеджердің білімі мен дағдылары оның тұтынушысы сатып алатын-алмайтындығына байланысты екенін білдіреді.

Туризмді басқару маңызды интегративті рөл атқарды. Кәсіби туристік білім берудің негізі технологиялар, инженерия, экономика, экология және тіпті маркетингтік менеджмент

емес екендігі кездейсоқ емес, өйткені бағыт туризмнің стратегиялық және интегративті генерациялау функциясын барынша жүзеге асыра алады. Сондықтан туристік қызмет саласындағы менеджер белгілі бір туристік бағыт туралы білімге ие болып қана қоймай, сонымен қатар өз клиентін сезінетін психолог болуы керек, халықаралық құқық негіздерін білуі керек және тұтынушының кез-келген сұрағына жауап беруге дайын болуы керек.

Жаңашылдықтың осы қызықты кезеңінде сәтті пайдаланып, қонақжайлылықтың өзгеретін тұжырымдамасына шығармашылықпен бейімделу, жаңа тенденциялардан пайда табу және нарықтағы үлесті кеңейту маңызды. Қонақ үй нарығының жаңа бұзушылары қонақ үй бизнесінің дәстүрлі модельдеріне қауіп төндіруі мүмкін, бірақ олар әрдайым жаңашылдық пен шығармашылықты бағалайтын саладағы жаңа өнімдерге мүмкіндіктер ашады. Іскери саяхатшылар да, туристер де қазіргі уақытта сапарларына жаңа қонақ үй өнімдерін қосуды талап етеді. Қонақжайлылық индустриясы өзінің платформаларына, форматтары мен брендтеріне жаңашылдықты және жаңа ұғымдарды енгізуді жалғастыруы керек.

Қорытынды. Қонақжайлылық саласында қолданылатын заманауи технологиялардың негізгі түрлеріне, Қазақстанда және шетелде жаңа технологияларды қолдану тәжірибесіне талдау жасалды. Үнемі дамып келе жатқан қонақжайлылық секторы дамыған және дамушы елдердің экономикасына әсер ететін негізгі факторлардың бірі болып табылады және ақпараттық технологияларды енгізу арқылы бұл сектор бұрынғыдан да күшейе түсті. Технология секторы соңғы 20 жыл ішінде көп өзгеріске ұшырағандықтан, ол әлемдік қонақжайлылық индустриясын жаңашыл технологиямен төңкеріп, жаңа бағдарлар орнатып, алдағы жылдары автоматтандыру мен механикаландыру арқылы болашақ жетістіктерге жетуге мүмкіндік береді.

Қонақжайлылық индустриясының технологиялары мен қызметтерінің барлық инновациялық құрылымы интернет пен IT әлемінің пайда болуымен өзгерді. Қазіргі уақытта IT секторы қонақ үй индустриясында өте маңызды рөл атқарады және оны қонақжайлылық саласындағы деректерді өңдеумен байланыстыруға болады. Қонақжайлылық индустриясы заманауи технологиялар саласындағы жетілдірілген шешімдер арқылы өз клиенттерінің сапарынан қонақүйге дейінгі саяхатын өзгертті. Салада болып жатқан өзгерістердің жетілдірілуі мен динамикалық процесі бүкіл әлем бойынша қозғалыстағы төңкеріске әкелген икемді жетілдірудің нәтижесі болып табылады.

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DYNAMIQUE ECONOMIQUE DE L'ENDETTEMENT PUBLIC EXTERIEUR

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Abstract :
The text presents a review of theoretical and empirical literature on the relationship between external public debt and economic growth. Theoretically, classical and neoclassical approaches warn against the negative effects of external debt, considering that it hampers savings and investment. Avramovic proposes a cyclical view in which debt initially stimulates growth but becomes unsustainable in the long term. Keynesian theory, on the other hand, sees public debt as a tool to boost demand. The debt-overhang theory highlights a threshold beyond which debt hinders growth, while acknowledging that a moderate level of debt can have a positive effect. Recent empirical studies offer varied results depending on country contexts and time periods. For instance, studies in Morocco and Côte d'Ivoire show moderate positive effects of debt, while analyses in Ethiopia and Central Africa reveal a negative effect beyond a certain threshold. Other studies identify optimal debt thresholds for maximizing growth, emphasizing the need for prudent management of external debt to avoid recessive impacts.
Keywords: Debt, economic growth, debt overhang, debt threshold.

INTRODUCTION

Depuis plusieurs décennies, la question de l'endettement public extérieur alimente de vifs débats au sein de la communauté des économistes et des décideurs. Ce phénomène est au cœur des préoccupations des pays en développement comme des nations avancées, où la gestion de la dette extérieure de l'État représente un défi de premier ordre pour la stabilité économique. En effet, l'impact de la dette publique extérieure sur l'économie réelle demeure un des enjeux majeurs de la macroéconomie moderne, car il touche directement les variables clés du développement économique, telles que la croissance, l'investissement, et l'épargne nationale. La dette extérieure peut représenter un levier important pour financer les besoins de développement ou les projets d'infrastructure, mais elle peut également devenir un fardeau qui limite les marges de manœuvre budgétaires et compromet la stabilité financière.

Les premières discussions autour de l'endettement extérieur remontent à plusieurs décennies, et le débat théorique sur l'influence de la dette publique extérieure sur les agrégats macroéconomiques s'est intensifié depuis plus de trente ans. Cette question a pris une dimension internationale au fur et à mesure que les marchés financiers se globalisaient et que de nombreux pays, en quête de financement pour leur développement, ont commencé à contracter des emprunts auprès d'institutions internationales ou sur les marchés de capitaux étrangers. La capacité des États à gérer efficacement leur dette extérieure pour stimuler la croissance économique sans compromettre la viabilité budgétaire reste donc une préoccupation centrale dans les analyses économiques et les politiques publiques.

Dans la littérature économique, les analyses théoriques et empiriques sur l'endettement extérieur de l'État se sont multipliées, offrant des perspectives diverses et parfois contradictoires. Les recherches se sont concentrées sur l'impact de la dette sur des variables comme la productivité, la dynamique de l'investissement privé, et la consommation. Parmi les contributions théoriques majeures, l'article de Barro en 1974 a marqué un tournant dans le débat sur la dette publique

extérieure. En développant le concept d'équivalence ricardienne, Barro a suggéré que, sous certaines conditions, l'endettement public pourrait ne pas affecter la demande agrégée, car les agents économiques anticipent les futurs impôts nécessaires pour rembourser la dette, modifiant ainsi leur comportement d'épargne et de consommation. Bien que cette théorie ait ouvert la voie à de nombreuses recherches, elle a aussi suscité des critiques et des débats, certains économistes soulignant que l'endettement extérieur peut affecter la confiance des investisseurs, la prime de risque du pays, et, en fin de compte, sa croissance économique.

Les études empiriques menées depuis font ressortir des contextes variés et ont mis en lumière les effets nuancés de la dette extérieure selon les caractéristiques économiques et institutionnelles des pays. Dans les pays en développement, par exemple, un niveau élevé de dette extérieure tend à être associé à un ralentissement de la croissance économique, un phénomène souvent attribué au surendettement et aux contraintes imposées par les bailleurs internationaux. Ces recherches s'efforcent de quantifier le seuil de dette extérieure au-delà duquel ses effets deviennent néfastes pour l'économie, tout en examinant les mécanismes par lesquels la dette publique peut freiner ou stimuler la croissance.

I- Présentation de littérature théorique sur la question de la dette publique extérieure

L'analyse de la relation théorique entre l'endettement externe de l'État et l'économie réelle, via les agrégats macroéconomiques, est bien documentée. L'idée que la croissance économique ne repose pas exclusivement sur les facteurs traditionnels, tels que le capital, le travail ou le progrès technique, mais également sur d'autres variables, notamment la dette publique extérieure, a donné lieu à l'émergence de nombreuses théories économiques. Parmi ces théories figurent celles des écoles classique et néoclassique, la théorie du cycle de la dette d'Avramovic, la théorie keynésienne et celle du surendettement.

1.1. Explication menée par les écoles classique et néoclassique

Les économistes classiques s'opposent fermement à l'endettement public, en particulier lorsqu'il est contracté auprès de sources étrangères. Ils considèrent ce type d'endettement comme une forme d'impôt différé, imposant un fardeau sur les générations présentes et futures. L'accumulation continue de la dette publique peut décourager l'épargne et l'investissement en capital, réduisant ainsi les perspectives de croissance.

Adam Smith (1759), l'un des pionniers de l'économie classique, s'oppose au recours aux financements extérieurs, estimant que ceux-ci incitent les gouvernements à des dépenses inefficaces qui pourraient nuire à l'économie nationale.

Jean-Baptiste Say (1799), tout en reconnaissant les avantages potentiels de l'endettement public, recommande une approche modérée pour éviter une spirale d'endettement où le remboursement des anciennes dettes nécessiterait de nouveaux emprunts.

Pour David Ricardo (1817), les agents économiques anticipent que l'État augmentera les impôts pour rembourser la dette, ce qui les incite à épargner davantage au détriment de la consommation, freinant ainsi la croissance.

Robert Barro (1989) a approfondi l'idée que les emprunts publics n'ont pas d'effet sur l'économie réelle si les agents économiques ne sont pas victimes de l'illusion fiscale. Son théorème d'équivalence, basé sur les travaux de Ricardo, stipule que les agents anticipent les hausses d'impôts futures et ajustent leur comportement en conséquence, en épargnant pour compenser l'endettement public.

Les néoclassiques, à leur tour, soulignent que l'accroissement de la dette publique détourne les ressources des activités productives vers le remboursement de la dette, ce qui ralentit l'économie. Selon eux, l'endettement public doit être utilisé avec prudence, servant uniquement à stabiliser à court terme les écarts entre les recettes et les dépenses, et non à financer des investissements à long terme.

1.2. Théorie du cycle de la dette d'Avramovic (1964)

La théorie du cycle de la dette, développée par Avramovic en 1964, présente l'endettement public comme un levier initial pour stimuler la croissance économique. Ce processus se déroule en trois phases distinctes :

- Phase initiale : L'économie souffre d'une insuffisance de l'épargne nationale, obligeant l'État à recourir à l'endettement extérieur pour financer ses investissements.
- Phase intermédiaire : L'emprunt extérieur stimule l'épargne nationale et permet de financer une partie des investissements. Cependant, le poids croissant de la dette commence à limiter cette dynamique.
- Phase finale : L'épargne nationale dépasse l'investissement, la dette extérieure cesse de croître, et l'économie entre dans une phase de consolidation avec une amélioration continue de la productivité.

Cette théorie met en lumière l'importance d'une gestion prudente de la dette publique pour éviter les pièges de l'endettement excessif tout en maximisant les bénéfices économiques à long terme.

1.3. Théorie keynésienne de l'endettement

Les keynésiens soutiennent que l'intervention de l'État est essentielle pour pallier les insuffisances de la demande, souvent à l'origine des déséquilibres économiques. Selon eux, l'endettement public, par le biais de la réduction des impôts et de l'augmentation des dépenses publiques, peut stimuler la consommation et relancer l'économie. En augmentant le revenu disponible des ménages, les emprunts publics dynamisent la demande globale, ce qui entraîne une hausse de la production et des revenus nationaux.

Dans le cadre du modèle IS-LM, une augmentation des dépenses publiques financée par l'endettement public a un effet expansionniste sur l'économie, augmentant les revenus et stimulant la demande de monnaie. Cet effet peut également être expliqué par le modèle de l'accélérateur flexible de Koyck, où les variations de la production influencent directement le niveau d'investissement.

1.4. Théorie du surendettement

La théorie du surendettement postule que l'impact de la dette publique sur la croissance économique n'est pas linéaire. Il existe un seuil critique au-delà duquel la dette devient insoutenable et nuit à la croissance. Lorsque la capacité de remboursement d'un pays est dépassée, les agents économiques anticipent une augmentation des impôts, ce qui freine les investissements et limite la croissance économique.

Cependant, un niveau modéré de dette publique, inférieur à ce seuil critique, peut avoir un effet positif sur la croissance en stimulant l'investissement et la demande à court terme.

1.5. Autres théories

D'autres théories ont également étudié la relation entre la dette publique et la performance économique. Nautel et Van Meensel (2011) ont montré que, bien que la dette publique puisse avoir un impact négatif à court terme, ses effets à long terme sont généralement positifs.

Les monétaristes, quant à eux, évoquent l'effet d'éviction, selon lequel l'endettement public tend à évincer l'investissement privé en accaparant les ressources financières disponibles, ce qui freine la croissance économique (De Leeuw et Holloway, 1983). Ce phénomène se produit particulièrement lorsque les titres publics deviennent des substituts aux actifs privés dans les portefeuilles des investisseurs.

Cette revue théorique met en évidence la diversité des approches concernant les effets de l'endettement public externe, soulignant les divergences d'opinion sur son impact à long terme sur l'économie nationale. Mais qu'en est-il des études empiriques ?

II- Revue des études empiriques récentes sur la relation entre la dette et l'économie

Les études empiriques récentes traitant de la relation entre la dette publique extérieure et l'économie mettent en lumière des dynamiques diverses selon les pays et les périodes étudiés.

Rachid Tatouti, Seil Elislam Jabhaoui et Hassan Mabrouki (2021) analysent l'impact de la dette extérieure publique sur la croissance économique au Maroc en utilisant un modèle VAR standard. Ils concluent que la dette publique extérieure n'a pas eu d'effet significatif sur la croissance économique au Maroc sur la période 1983-2019, selon la fonction de réponse impulsionnelle et la décomposition de la variance.

Berhanu Getinet et Fikadu Ersumo (2020) étudient l'impact de la dette publique extérieure sur la croissance économique en Éthiopie via un modèle ARDL avec tests de co-intégration pour le long terme et un modèle ECM pour les dynamiques à court terme. Leur analyse révèle que pendant la période 1983-2018, la dette extérieure a eu un effet négatif à la fois à long et à court terme, exerçant un effet d'éviction et un effet de surendettement.

Djibrila Oumar (2022) examine la dette extérieure de la Côte d'Ivoire à travers des indicateurs de soutenabilité de la dette. Il constate que la soutenabilité de la dette s'est améliorée après que la Côte d'Ivoire ait atteint son point d'achèvement, bien que la situation ait été préoccupante avant cette période (1980-2021).

Jean Christophe Ntita Ntita et ses collègues (2020) étudient la relation non linéaire entre la dette extérieure et la croissance dans les pays de la CEMAC, en appliquant le modèle de Hansen (1999). Ils ont identifié un seuil optimal de 72,11 % du PIB au-delà duquel la dette extérieure a un effet négatif sur la croissance économique, mais un effet positif en dessous de ce seuil.

Au Maroc, Rachid El Bettioui et Aziz Ouia (2020) montrent, à travers un modèle linéaire multivarié, que la dette extérieure publique a contribué positivement à la croissance économique entre 1994 et 2013, bien que le service de la dette ait eu un effet négatif.

Chukwunenye N. Kocha, Marshal Iwedi et James Sarakiri (2021) examinent l'impact de la dette extérieure publique sur la formation de capital en Afrique subsaharienne en utilisant le Pooled Mean Group Approach. Leur étude couvre la période 2000-2008 et montre que la dette extérieure a un impact marginal à court terme mais un effet négatif à long terme sur la formation de capital.

Dans le cas de Djibouti, Abdelouahab Maarouf et Omar Ahmed (2021) utilisent un modèle ARDL pour analyser l'impact de la dette publique extérieure. Leur étude sur la période 1987-2017 révèle que l'effet positif de la dette sur la croissance diminue lorsque la dette est exprimée en valeur actuelle nette.

Mohamed El-Qasemy et Lalla Zhor Alaoui Omari (2021) identifient les moteurs de l'endettement extérieur public au Maroc à travers un modèle ARDL. Entre 1998 et 2019, ils concluent que la dette extérieure publique est influencée par le solde du compte courant et le service de la dette, visant à maintenir les réserves de change.

Frédéric Nimubona (2020) étudie la soutenabilité de la dette extérieure dans les pays de la Communauté de l'Afrique de l'Est (CEA) via le test de co-intégration de Johansen. Il constate que la dette est soutenable pour la majorité des pays de la CEA sur la période 1980-2018, excepté le Burundi.

En République Démocratique du Congo, Franck Kazadi Ntita et ses collègues (2019) identifient une relation non linéaire entre la dette extérieure publique et la croissance économique. Avec un modèle à correction d'erreurs (Engle et Granger, 1987), ils trouvent un seuil optimal de 22,5 % du PIB, au-delà duquel la dette affecte négativement la croissance économique sur la période 1981-2015.

Au Niger, Rabiatou Samna Soumana (2017) utilise une optimisation de la fonction dynamique du bien-être social pour montrer qu'un endettement prenant en compte les inégalités intertemporelles a favorisé une croissance positive à long terme pendant 1970-2015, avec un taux de croissance de 9,5 % pour un intérêt réel de 6,5 %.

Louis Henri Ngah Ntiga (2023) analyse les effets non linéaires de la politique budgétaire sur la croissance au Cameroun à travers un modèle à seuil de Hansen (2000). Il trouve un seuil optimal

de dette extérieure de 38,98 % du PIB, au-delà duquel la politique budgétaire devient récessive entre 1993 et 2020.
Enfin, Sangaré M.B. (2023) se concentre sur la soutenabilité et la stationnarité de la dette au Mali. Son analyse descriptive et économétrique indique que la dette publique du Mali n'est pas soutenable sur la période 1970-2014.

CONCLUSION

Bref, la dette publique extérieure est un outil de financement essentiel pour de nombreux pays, capable de stimuler le développement et d'améliorer la compétitivité lorsqu'elle est bien gérée. Cependant, une mauvaise gestion peut engendrer des déséquilibres macroéconomiques et limiter la croissance. La recherche et les pratiques de gestion continuent d'évoluer, permettant aux économistes et aux gouvernements de rechercher les meilleures stratégies pour maximiser les bénéfices de l'endettement extérieur tout en en minimisant les risques pour l'économie.
Ainsi, la gestion de la dette publique extérieure constitue un enjeu fondamental pour les économies contemporaines. En effet, l'endettement extérieur, lorsqu'il est maîtrisé et orienté vers des investissements productifs, peut servir de catalyseur pour la croissance économique, surtout dans les pays à faible revenu ou à revenu intermédiaire, où l'épargne nationale est souvent insuffisante pour répondre aux besoins de financement de développement.
Pour les pays à faible revenu, la gestion de la dette publique extérieure doit trouver un équilibre entre la mobilisation de ressources essentielles et la viabilité financière. Un endettement bien orienté compense le manque de ressources internes, favorisant les investissements dans des secteurs prioritaires. Cependant, un excès ou une mauvaise orientation de la dette peut alourdir le fardeau des remboursements, réduire les fonds disponibles pour d'autres investissements clés et accroître la vulnérabilité aux chocs économiques extérieurs.
Pour les pays surendettés, en revanche, la gestion de la dette extérieure impose des choix budgétaires et financiers plus stricts. Dans ces économies, la priorité est souvent de stabiliser les finances publiques pour éviter une crise de la dette qui pourrait mener à une perte de confiance des investisseurs, une augmentation des primes de risque, et un ralentissement de l'économie.
Les travaux économiques continuent d'approfondir la compréhension de la dette extérieure et de ses effets en identifiant les conditions sous lesquelles elle contribue ou nuit au développement. De nombreuses études empiriques tentent de déterminer le seuil de la dette publique au-delà duquel ses effets deviennent négatifs, c'est-à-dire qu'elle commence à ralentir la croissance au lieu de la stimuler. Ce seuil varie en fonction de plusieurs facteurs : la structure de l'économie, le niveau de développement, la capacité de gestion de la dette, et la stabilité politique. Les économistes s'accordent de plus en plus sur l'idée qu'il n'existe pas de « taille unique » en matière de gestion de la dette extérieure ; les stratégies doivent être adaptées au contexte propre à chaque pays.

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ПЕРСПЕКТИВЫ РАЗВИТИЯ ТУРИЗМА В КАТОН-КАРАГАЙСКОМ НАЦИОНАЛЬНОМ ПАРКЕ

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Аннотация: *Катон-Карагайский государственный национальный природный парк (ГНПП) представляет собой важный природный и культурный объект, привлекающий туристов благодаря уникальным ландшафтам, богатому биоразнообразию и культурному наследию. В условиях растущего интереса к экотуризму исследование направлено на оценку возможностей устойчивого развития туризма в регионе. Основная цель работы – анализ потенциала Катон-Карагайского ГНПП для развития туристской инфраструктуры, а также выявление направлений и проблем в сфере туризма.*

Парк предлагает разнообразные возможности для экотуризма и активного отдыха, включая трекинг, рафтинг и наблюдение за природой, но сталкивается с такими вызовами, как сезонные ограничения, недостаток развитой инфраструктуры и нехватка квалифицированных кадров. Предложенные меры включают улучшение инфраструктуры, продвижение парка на международном уровне, развитие экологически чистых технологий и цифровых решений для привлечения посетителей.

Реализация комплекса этих мероприятий обеспечит рост туристского потока, создаст рабочие места для местных жителей и будет способствовать экономическому развитию региона, сохраняя при этом его природные ресурсы.

Ключевые слова: Катон-Карагайский ГНПП, перспективы развития, туристская инфраструктура, экотуризм

Катон-Карагайский государственный национальный природный парк (ГНПП) представляет собой уникальный природный и культурный ресурс. Его живописные пейзажи, богатое биоразнообразие и культурное наследие привлекают как местных жителей, так и туристов. В последние годы наблюдается рост интереса к экотуризму и активному отдыху на природе, что открывает новые возможности для развития туристской инфраструктуры в этом регионе. Актуальность исследования обусловлена необходимостью оценки потенциала Катон-Карагайского ГНПП для устойчивого развития туризма, который может стать важным фактором экономического роста и социальной стабильности в этом районе. Учитывая глобальные тенденции в туристской отрасли, необходимо разработать стратегии, которые обеспечат гармоничное сочетание интересов туристов и охраны окружающей среды [1].

На 2024 год Катон-Карагайский национальный парк продолжает привлекать большое количество туристов. На его территории действуют 10 туристских маршрутов и 4 тропы общей протяженностью более 680 км. Парк является важным экологическим объектом,

включенным во Всемирную сеть биосферных резерватов ЮНЕСКО, что способствует его популярности среди любителей природы и экотуризма [2].

Туристская инфраструктура Катон-Карагайского государственного национального природного парка (ГНПП) предлагает разнообразные объекты и услуги, направленные на привлечение туристов и развитие местного сообщества. На 2024 год в национальном парке функционируют (рисунок 1): 10 гостевых домов, предлагающих комфортные условия для проживания туристов;т12 пантолечебниц, специализирующихся на восстановительных процедурах и привлекающих медицинских туристов; 3 гостиницы, которые обеспечивают широкий спектр услуг для посетителей [3].

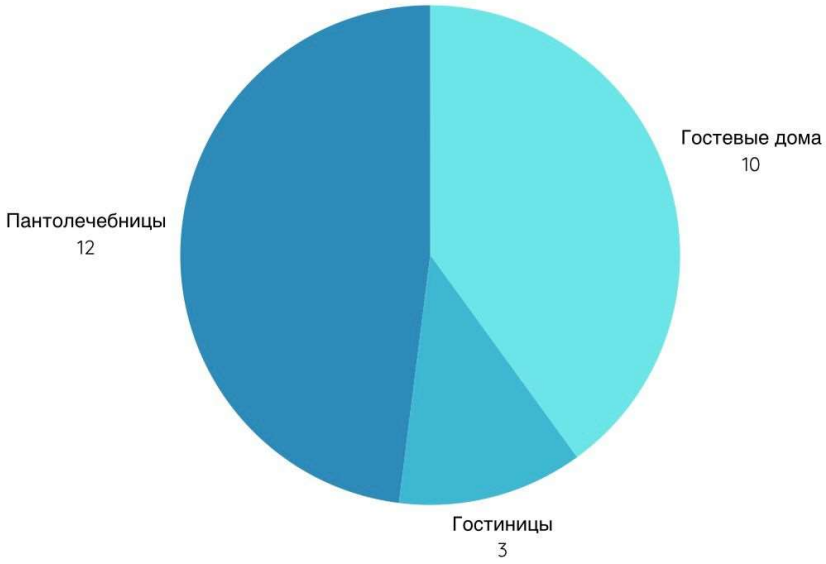

Рисунок 1. Средства размещения на территории Катон-Карагайского ГНПП

Кроме того, в парке активно развиваются экотуризм и сельский туризм, предлагая туристам различные активные виды отдыха, такие как рафтинг, охота и пешие походы. В рамках дальнейшего развития инфраструктуры планируется создание новых туристческих маршрутов, мест для ночевки, этноаулов, кемпингов и смотровых площадок, что позволит улучшить условия для отдыха и знакомства с природой.

Потенциал Катон-Карагайского парка для различных видов туризма огромен. Уникальная природа парка предоставляет возможности для развития экологически ориентированных туров. Создание экотроп, образовательных маршрутов и экологических лагерей привлечет туристов, ценящих устойчивый туризм. Активные виды туризма, такие как трекинг, горные велосипеды, альпинизм, рафтинг и конные прогулки можно развивать, организуя более разнообразные маршруты и улучшая доступ к труднодоступным районам. Исторические и археологические памятники региона могут быть интересны туристам, что позволяет развивать экскурсионные программы, включающие посещение древних курганов и знакомство с местными традициями [4].

В последние годы Катон-Карагайский парк становится все более популярным среди любителей активного отдыха и экологического туризма. Здесь уже проложены трекинговые маршруты, есть возможности для альпинизма и наблюдения за дикой природой. Однако развитие туристской инфраструктуры пока остается на низком уровне. Основные проблемы включают:

- Недостаточная инфраструктура: нехватка качественных дорог и современных гостиничных комплексов ограничивает доступность региона для широкой аудитории туристов.

- Сезонные ограничения: туристская активность в парке сосредоточена на теплых месяцах (май-сентябрь), что затрудняет развитие круглогодичного туризма.
- Низкий уровень качества услуг: недостаток квалифицированных гидов, слабое продвижение парка как туристского направления.

Для решения вышеуказанных проблем и увеличения потока туристов в Катон-Карагайском Государственном Национальном Природном Парке можно предложить следующие меры (таблица 1, VRIO-анализ):

Мероприятие	Ценность	Редкость	Имитируемость	Организационная поддержка	Конкурентное преимущество
Развитие инфраструктуры и улучшение доступа	Высокая	Средняя	Низкая	Высокая	Устойчивое
Реконструкция и строительство дорог	Да	Нет	Нет	Да	Да
Создание разнообразных мест размещения	Да	Да	Средняя	Да	Да
Обустройство туристских троп и смотровых площадок	Да	Нет	Нет	Да	Да
Разработка новых туристских продуктов и услуг	Высокая	Высокая	Средняя	Высокая	Устойчивое
Тематические туры и экскурсии	Да	Да	Средняя	Да	Да
Организация фестивалей и культурных мероприятий	Да	Да	Средняя	Да	Да
Развитие оздоровительного и зимнего туризма	Да	Средняя	Средняя	Да	Да
Маркетинг и продвижение парка	Высокая	Средняя	Высокая	Высокая	Устойчивое
Создание узнаваемого бренда парка	Да	Да	Средняя	Да	Да
Участие в международных туристстких выставках	Да	Средняя	Средняя	Да	Да
Сотрудничество с туроператорами и авиакомпаниями	Да	Средняя	Средняя	Да	Да
Развитие экологически чистых технологий	Высокая	Высокая	Средняя	Высокая	Устойчивое
Использование возобновляемых источников энергии	Да	Да	Средняя	Да	Да
Организация экологических маршрутов	Да	Да	Средняя	Да	Да
Электротранспорт и прокат электровелосипедов	Да	Средняя	Средняя	Да	Да

Улучшение качества сервиса и подготовки кадров	Высокая	Средняя	Высокая	Высокая	Устойчивое
Обучение гидов и сотрудников	Да	Нет	Нет	Да	Да
Программы подготовки местного населения	Да	Средняя	Средняя	Да	Да
Развитие цифровых технологий	Высокая	Средняя	Высокая	Высокая	Устойчивое
Создание мобильного приложения для туристов	Да	Да	Средняя	Да	Да
Виртуальные туры и цифровые экскурсии	Да	Да	Средняя	Да	Да

Таблица 1. “VRIO-анализ предложенных мер по увеличению потока туристов в Катон-Карагайском ГНПП”

В предложенной таблице проведен анализ VRIO, который позволяет оценить предложенные меры по увеличению потока туристов в Катон-Карагайском государственном национальном природном парке. Результаты анализа демонстрируют высокую ценность большинства предложенных инициатив, что подтверждает их значимость для развития туристской привлекательности парка.

Развитие инфраструктуры и улучшение доступа рассматриваются как ключевые факторы, способствующие увеличению туристского потока. Реконструкция дорог и создание новых мест размещения имеют высокую ценность, хотя их редкость и сложность имитации могут быть ниже. Это свидетельствует о возможности их реализации в условиях конкуренции. Разработка новых туристских продуктов и услуг, таких как тематические туры и фестивали, является не только ценным, но и уникальным предложением. Эти меры могут привлечь разнообразные группы туристов и увеличить их интерес к парку. Редкость этих инициатив на рынке делает их особенно привлекательными для внедрения, что может создать долгосрочное конкурентное преимущество [5].

Маркетинг и продвижение парка также играют критическую роль в привлечении туристов. Создание узнаваемого бренда и участие в международных выставках могут значительно повысить видимость парка на рынке. Сильная организационная поддержка этих мероприятий также указывает на высокие шансы на успех. Развитие экологически чистых технологий и использование возобновляемых источников энергии выделяются как важные компоненты устойчивого развития парка. Эти меры не только повышают экологическую устойчивость, но и соответствуют современным трендам в области туризма, что делает их особенно ценными и редкими.

Улучшение качества сервиса и подготовка кадров напрямую влияют на общее впечатление туристов. Обучение сотрудников и вовлечение местного населения в туристские проекты являются жизненно важными для создания комфортной и приятной атмосферы для посетителей. Наконец, развитие цифровых технологий, таких как мобильные приложения и виртуальные туры, открывает новые горизонты для привлечения современных туристов, которые ценят удобство и доступность информации [6].

В целом, предложенные меры имеют высокую ценность, редкость и потенциал для создания конкурентного преимущества. Их успешная реализация может не только увеличить туристский поток, но и способствовать устойчивому развитию Катон-Карагайского ГНПП, обеспечивая сохранение природных ресурсов и благосостояние местного населения.

Перспективы развития туризма в Катон-Карагайском государственном национальном

природном парке (ГНПП) являются многообещающими благодаря его уникальному природному и культурному наследию. Растущий интерес к экотуризму, активному отдыху и культурным мероприятиям открывает новые возможности для привлечения туристов. Реализация комплекса мероприятий, включая развитие инфраструктуры, создание новых туристических продуктов, активное продвижение парка и внедрение экологически чистых технологий, позволит значительно увеличить поток посетителей.

Ключевым моментом является интеграция местного населения в туристическую отрасль, что не только улучшит качество сервиса, но и создаст новые рабочие места, способствуя экономическому развитию региона. Важную роль в этом процессе играют современные цифровые технологии, такие как мобильные приложения и виртуальные туры, которые могут сделать информацию о парке более доступной и привлекательной для туристов.

Таким образом, устойчивое развитие туризма в Катон-Карагайском ГНПП возможно при условии комплексного подхода, включающего охрану окружающей среды и удовлетворение потребностей туристов. Это обеспечит не только экономическую выгоду, но и сохранение природных ресурсов, делая парк привлекательным местом для посещения как для местных жителей, так и для туристов со всего мира.

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ТЕРМИНОЛОГИЯ ФАРМАЦЕВТИКИ: ИСТОКИ, ЭВОЛЮЦИЯ И СОВРЕМЕННОЕ ЗНАЧЕНИЕ

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Аннотация: В этой статье рассматриваются процессы формирования новых терминов в сфере фармацевтического производства с особенным вниманием к заимствованию из греческого, арабского и английского языков. Даны подробные способы образования новых терминов.
Ключевые слова: Термины, фармацевтика, медицина, исследования, заимствованные слова, инновации

Фармацевтическая терминология играет ключевую роль в медицине и фармацевтической промышленности. Она обеспечивает точное и однозначное общение среди специалистов. Современная фармацевтическая терминология сформирована под влиянием множества факторов, включая историю, заимствование иностранных слов и создание новых терминов.Терминология фармацевтики уходит корнями в Древнюю Грецию и Рим, когда первые медицинские школы начали систематизировать знания о лекарственных средствах. Многие термины восходят к древнегреческому и латинскому языкам. Например:
Adjuvans – от лат. *adjuvare* (помогать, усиливать) – вспомогательное средство, вещество, усиливающее действие основного препарата.
Anesthesia – от греч. *an-* (отрицательная частица) и *aisthesis* (ощущение) – состояние, при котором временно утрачивается чувствительность, например, при хирургических вмешательствах.
Antisepticus – от греч. *anti-* (против) и *septikos* (гнилостный) – вещество, предотвращающее или замедляющее развитие микроорганизмов.
Capsula – от лат. *capsa* (коробка, ящик) – капсула, оболочка для дозирования лекарств.
Extractum – от лат. *extrahere* (вытягивать) – экстракт, концентрированное вещество, полученное из сырья (растений, микроорганизмов) путем экстракции.
Hydro – от греч. *hydor* (вода) – используется для обозначения водного раствора, например, hydrochloricum (соляная кислота).
Oculus – от лат. *oculus* (глаз) – используется в терминах, связанных с глазами, например, oculist (окулист).
Analgeticum – от греч. *an-* (без) и *algesis* (боль) – обезболивающее средство.

Injectio – от лат. *in-jectio* (введение внутрь) – инъекция, введение препарата в ткани или сосуды.
Emulsio – от лат. *emulgere* (выдаивать, выжимать) – эмульсия, смесь двух жидкостей, не смешивающихся друг с другом, часто используемая в фармакологии.Эти и другие термины имеют греко-латинское происхождение и демонстрируют богатую историю использования этих языков в медицине.Латинский язык долгое время оставался основным языком медицинской и фармацевтической литературы, и многие названия лекарств использовались и продолжают использоваться в рецептуре.

В Средние века и эпоху Возрождения терминология обогащалась благодаря достижениям арабских медиков и ученых, которые ввели множество новых терминов, включая названия лекарственных растений и методов приготовления препаратов. Многие арабские термины, связанные с лекарственными растениями, были заимствованы в европейские языки. Например:
"Зенжабил" — арабское слово, означающее "имбирь", стало широко использоваться в фармацевтической практике для обозначения этого растения, известного своими целебными свойствами
"Сафран" — это слово пришло из арабского языка и обозначает специю, извлекаемую из цветков крокуса. Сафран использовался не только как пряность, но и в лечебных целях.
Арабские медики разработали множество методов экстракции и приготовления лекарств
"Дистилляция" — термин, происходящий от арабского слова "al-imbik", обозначающего процесс выделения активных веществ из растений с помощью нагревания и конденсации паров. Этот метод стал основой для производства эфирных масел и спиртов.
"Сироп" (шарбат) — этот термин происходит из арабского языка и обозначает сладкий напиток, который использовался в медицине для облегчения симптомов различных заболеваний. Сиропы быстро завоевали популярность в европейской фармацевтике.
"Пилюли" — слово, заимствованное из арабского, обозначает небольшие круглые дозы лекарств, используемых для облегчения симптомов или лечения заболеваний.
Арабская медицина сыграла ключевую роль в сохранении и передаче знаний античной науки, а также в разработке новых концепций и методов, что оказало значительное влияние на европейскую фармацевтическую терминологию.

Фармацевтическая отрасль активно заимствовала слова из различных языков. В настоящее время основными источниками заимствований являются английский, французский, немецкий и латинский. Английский язык стал основным источником заимствований в фармацевтической терминологии благодаря его статусу международного языка науки и медицины. Вот примеры английских слов, которые широко используются в фармацевтике:
Байпас (*bypass*) – хирургическая операция, направленная на создание обходного пути для крови при нарушении проходимости сосудов.
Дозатор (*dispenser*) – устройство для точного дозирования лекарственных средств, особенно в форме спреев или инъекций.
Инфузия (*infusion*) – процесс медленного введения жидкости или раствора в кровеносную систему.
Контрацептив (*contraceptive*) – средство, используемое для предотвращения нежелательной беременности.
Скрининг (*screening*) – метод массового обследования для выявления заболеваний на ранних стадиях.
Комплаенс (*compliance*) – термин, обозначающий соблюдение пациентом предписанных рекомендаций по приему лекарств и режима лечения.

Мониторинг (*monitoring*) – наблюдение за состоянием пациента, его биомаркерами и динамикой болезни для оценки эффективности лечения.
Клининг (*cleaning*) – очищение или дезинфекция, используемое в стандартах стерильности для производства и хранения лекарств.
Клиренс (*clearance*) – термин, обозначающий способность организма выводить лекарственное вещество, важный показатель в фармакокинетике. Эти заимствованные термины укрепили позиции английского языка в фармацевтической терминологии и облегчают международное сотрудничество в науке и медицине.

Со временем новые термины начали появляться с научными и технологическими новшествами, при описании новых методов лечения, лекарственных форм и технологий производства. Например:
Vaccine (вакцина) – от лат. *vaccinus* (коровий), термин был введен в конце XVIII века после разработки Эдвардом Дженнером первой вакцины против оспы.
Antibiotic (антибиотик) – от греч. *anti-* (против) и *bios* (жизнь), введен в 1940-х годах для обозначения препаратов, подавляющих рост бактерий.
Biotechnology (биотехнология) – от греч. *bios* (жизнь) и *techne* (искусство, ремесло), используется для описания применения биологических процессов и технологий в фармацевтике.
Nanotechnology (нанотехнология) – от греч. *nanos* (карлик, мельчайшая часть) и *technology* (технология), описывает технологии создания препаратов и устройств на молекулярном уровне.
Immunotherapy (иммунотерапия) – от лат. *immunitas* (защита, освобождение) и *therapy* (лечение), обозначает методы лечения, направленные на укрепление иммунной системы.
Probiotic (пробиотик) – от греч. *pro* (для) и *bios* (жизнь), используется для обозначения полезных микроорганизмов, улучшающих микрофлору организма.
Genetic engineering (генная инженерия) – от греч. *genea* (происхождение) и *engineering* (инженерия), описывает технологии изменения генетического материала для создания лекарственных средств и вакцин.
Chemotherapy (химиотерапия) – от греч. *chemeia* (химия) и *therapy* (лечение), используется для обозначения лечения заболеваний, особенно рака, с помощью химических препаратов. Эти заимствования подчеркивают, насколько активно фармацевтическая терминология пополняется за счет технологических и научных достижений, отражая развитие медицины и методов лечения.

Создание новых слов в фармацевтической терминологии происходит с помощью разнообразных способов, включая использование префиксов и суффиксов, сложение слов и создание аббревиатур. Например:
Префиксы и суффиксы помогают уточнить или конкретизировать значения слов, делая терминологию более точной:

- Анти-: префикс, обозначающий «против», используется в таких словах, как антибактериальный (против бактерий), антивирусный (против вирусов).
- Гипо-: префикс, означающий «пониженный», применяется в словах гипогликемия (пониженное содержание сахара в крови).
- -ит: суффикс, указывающий на воспаление, например, фарингит (воспаление горла), артрит (воспаление суставов).
- -цид: суффикс, обозначающий «уничтожение», как в бактерицид (убивающий бактерии).
- -логия: суффикс, означающий «наука» или «изучение», например, фармакология (наука о лекарствах), токсикология (изучение токсинов).

Сложение двух корней или слов помогает создавать термины для описания новых процессов, препаратов или методов лечения:

- Фармакокинетика – от греч. *pharmakon* (лекарство) и *kinesis* (движение), описывает процессы всасывания, распределения и выведения лекарств из организма.
- Фармакодинамика – от греч. *pharmakon* и *dynamis* (сила), обозначает воздействие лекарства на организм.
- Кардиопротектор – от лат. *cardia* (сердце) и *protector* (защитник), описывает препараты, защищающие сердце.
- Нейропротектор – от греч. *neuron* (нерв) и лат. *protector*, обозначает препараты для защиты нервных клеток.

Аббревиатуры часто используются в фармацевтической и медицинской практике для упрощения длинных терминов:

- НПВП – нестероидные противовоспалительные препараты, часто обозначают класс лекарств для снятия боли и воспаления.
- АД – артериальное давление, показатель кровяного давления в медицинской практике.
- КТ – компьютерная томография, метод визуализации органов.
- ПЦР – полимеразная цепная реакция, метод, используемый для анализа генетического материала.

Эти методы формирования терминов позволяют фармацевтической отрасли гибко реагировать на научные открытия и технологические нововведения, обеспечивая точность и однозначность терминологии.

Фармацевтическая терминология имеет сложную и многогранную структуру, в которой отражены исторические заимствования, развитие науки и технологические нововведения. В современном мире, где английский язык стал международным стандартом в фармацевтике, важно продолжать развитие и стандартизацию терминологии для облегчения взаимодействия специалистов на международном уровне. Английский язык играет ключевую роль в фармацевтической промышленности, поскольку он является основным языком международной науки и бизнеса. Большинство научных публикаций и инструкций по использованию лекарств публикуется на английском. Английский также используется для описания технологий, протоколов безопасности и стандартов, которые имеют важное значение для международной торговли и производства.Использование английского языка способствует стандартизации и унификации фармацевтической терминологии, что позволяет обеспечить высокий уровень точности и однозначности в международной практике. На сегодняшний день многие национальные фармакопеи включают английские термины и определения для облегчения взаимодействия с международными организациями, такими как Всемирная организация здравоохранения (ВОЗ) и Управление по контролю качества пищевых продуктов и лекарственных препаратов США (FDA). Знание английского языка и специализированной терминологии становится ключевым фактором для успешной работы в этой сфере. Термины, относящиеся к процессам производства, контролю качества и биофармацевтике, являются универсальными инструментами общения и позволяют специалистам чётко понимать требования к каждому этапу производства. Они также облегчают доступ к международным источникам информации, научным исследованиям и передовым технологиям, что критически важно в условиях быстрого развития фармацевтической науки и конкуренции на глобальном рынке

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Fransız dilində sual cümləsinin təhlili

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Xülasə :
Yazıda sual cümləsindən sonra həmişə sual işarəsi qoyulur. Ümumi sual cümləsi yaranma yoluna görə üç yerə bölünür :
1.İntonasiya vasitəsi ilə- à l'aide de l'intonation
2."Est-ce que" ifadəsinin köməyi ilə- à l'aide de l'expression "est-ce que"
3.İnversiya vasitəsi ilə- à l'aide de l'inversion
2 cür inversiya var.
1. Sadə inversiya – l'inversion simple
2. Mürəkkəb inversiya – l'inversion complèxe
İntonasiyanın və ədatın köməyi ilə yaranan cümlələrə özlərini və ya onların bir hissəsini təkrar etmək, ya da "bəli", "yox" təsdiq və inkar ədatları ilə cavab vermək olar. Sual əvəzlikləri ilə yaranan cümlələrə bir qayda olaraq, cümlədəki əvəzliyin əvəzinə tələb olunan cavabı işlətmək lazımdır.Elə cümlələr var ki, onların yaranmasında həm ədatlar, həm də sual əvəzlikləri iştirak edir. Beləliklə, cümlədə heç bir dəyişiklik etmədən, yalnız xəbərin son hecasını bir qədər uzun tələffüz etməklə nəqli cümləni sual cümləsinə çevirmək olur. Söz sırası olduğu kimi qalır və hətta məntiqi vurğunun öz yerini dəyişməsi də buna mane ola bilmir.

Açar sözlər: Sadə inversiya, mürəkkəb inversiya, intonasiya, ümumi sual, xüsusi suallar

Cümləyə verilən suala ümumi sual deyilir. Ümumi sual Azərbaycan dilinə *mı*[4], sual ədatı vasitəsi ilə tərcümə olunur və bir neçə yolla düzəlir:

1. **İntonasiya vasitəsi ilə- à l'aide de l'intonation**

Bu vaxt cümlə sual intonasiyası ilə deyilir və onun sonuna nöqtə əvəzinə sual işarəsi qoyulur.
Par exemple : Il parle.- O danışır.
Il parle?- O danışırmı?

2. **"Est-ce que" ifadəsinin köməyi ilə- à l'aide de l'expression "est-ce que"**

İstənilən cümlənin əvvəlinə sual ifadəsi olan "est-ce que" yazmaqla, onu sual cümləsinə çevirmək olar. [1.s111] Bu vaxt söz sırası pozulmur.
Par exemple : Ali lit.- Əli oxuyur.
Est-ce qu` Ali lit ?- Əli oxuyurmu?

3. **İnversiya vasitəsi ilə- à l'aide de l'inversion**

2 cür inversiya var.

4. **Sadə inversiya – l'inversion simple**

Bu vaxt mübtəda şəxs əvəzliyi ilə ifadə olunur, inversiya vaxtı mübtəda ilə xəbər yerini dəyişir
Par exemple: Il lit- O, oxuyur.
Lit-il?- O oxuyurmu?

5. **Mürəkkəb inversiya – l'inversion complèxe**

Bu vaxt mübtəda isimlə ifadə olunur. Sual formasını düzəldərkən mübtəda və xəbər yerində qalır, xəbərdən sonra mübtədanı əvəz edən III şəxsin əvəzliyi yazılır.
Par exemple : Samir lit.- Samir oxuyur
Samir lit-il?-Samir oxuyurmu?

C'est un livre.- Bu qəbildən olan cümlələrin sual forması inversiya vasitəsi ilə düzəlir.
Est-ce un livre? Bu kitabdırmı?

Ce sont des cahiers. Bu tipli cümlələrin sual forması isə yalnız “est-ce que” ifadəsinin köməyi ilə düzəlir. [2.s179]
Est-ce que ce sont des cahiers? – Bunlar dəftərlərdirmi?
Ümumi suallara ya bəli, ya da xeyr cavabı verilir.
Par exemple :
Lit-il? O oxuyurmu?
Oui, il lit. Bəli, o oxuyur.
Non, il ne lit pas. – Xeyr, o oxumur.
Ümumi suallara 2 cür təsdiq cavab verilir.

6. Əgər sual cümləsi təsdiqdədirsə, onda ona “**oui**” cavabı verilir.

Parles-tu français? – Sən fransızca danışırsanmı?
Oui, je parle français. Bəli, mən fransızca danışıram.

7. Əgər sual inkardadırsa, bu zaman ona “**si**” cavabı verilir. Sual inkarda verilən zaman “ne” feildən əvvəl, “pas” isə şəxs əvəzliyindən sonra yazılır.

Ne parles-tu pas français? – Sən fransızca danışmırsan?
Si, je parle français.- Bəli, mən fransızca danışıram.
Est-ce que tu ne parles pas français? – Sən fransızca danışmırsan?
Si, je parle français. – Bəli, mən fransızca danışıram.

Les questions spéciales – Xüsusi suallar
Bu suallar cümlə üzvlərinə verilən suallardır. Sual sözü cümlənin əvvəlində gəlir.

1. **Le sujet (mübtəda)**

2 cür mübtəda var: **canlı və cansız.**
Canlı mübtədanın sualı: **Qui? – Kim? Qui est-ce qui?-Kim?**
Cansız mübtədanin sualı: **Qu’est-ce qui?-Nə?**
Mübtədaya sual verərkən söz sırası dəyişmir, xəbər III şəxsin təkində olur.
Les enfants sont dans la cour.- Uşaqlar həyətdədirlər.
Qui est dans la cour?- Kim həyətdədir?
Les livres sont sur la table.- Kitablar stolun üstündədir.
Qu’est-ce qui est sur la table?- Nə stolun üstündədir?

2. **Le prédicat (xəbər)**

Que faire? – Nə etmək?
Xəbər hansı zamandadırsa, sual da o zamanda verilir. [2.s183]
Valérie et Nicole vont au cinéma.- Valeri və Nikol kinoya gedirlər.
Que Valérie et Nicolas font-ils? – Valeri və Nikol nə edirlər?
Nous irons au parc. – Biz parka gedəcəyik.
Que ferons-nous? – Biz nə edəcəyik?

3. **Le complément d’objet direct (vasitəsiz tamamlıq)**

Canlı: Qui? Kimi? (inversiya olur)
Qui est-ce que? – Kimi? (inversiya olunmur)
Sara cherche Vugar.- Sara Vüqarı axtarır.
Qui Sara cherche-t-elle? – Sara kimi axtarır?
Qui est-ce que Sara cherche? – Sara kimi axtarır?
Cansız: **Que? Nəyi?** (inversiya olur)
Qu’est-ce que? – nəyi? (inversiya olunmur)
Sara cherche son livre.- Sara kitabını axtarır.
Que Sara cherche-t-elle? – Sara nəyi axtarır?
Qu’est-ce que Sara cherche? – Sara nəyi axtarır?

4. **Le complément d’objet indirect (vasitəli tamamlıq)**

Canlı: À qui? – Kimə ?, De qui? – Kimdən?, Pour qui? – Kim üçün?, Sans qui? – Kimsiz? Chez qui?- Kimgilə? Kimgildə?
Cansız: À quoi?- Niyə?, De quoi? Nədən?
Bütün bu sual sözlərindən sonra inversiya vacibdir. Əgər bu sözlərdən sonra **est-ce que** sual sözü qoyularsa, onda inversiya olunmur.
Sabir parle de Nazim. – Sabir Nazimdən danışır.
De qui Sabir parle-t-il? Sabir kimdən danışır?
De qui est-ce que Sabir parle? – Sabir kimdən danışır?

5. Zərflik (adverbe)

8. Tərzi hərəkət zərfi (l'adverbe de manière)

Comment?- Necə ?
Il lit vite. O tez-tez oxuyur.
Comment lit-il? O necə oxuyur?
Comment est-ce qu'il lit? O necə oxuyur?

9. Zaman zərfi (l'adverbe de temps)

Quand? Nə vaxt?, Depuis quand? – Nə vaxtdan bəri?
Michel part demain. Mişel sabah yola düşür.
Quand Michel part-il?
Quand est-ce que Michel part? Mişel nə vaxt yola düşür?

10. Yer zərfi (l'adverbe de lieu)

Où? Hara? Harada?, D'où? – Haradan?
Où va-t-il? Où est-ce qu'il va? O hara gedir?
İl va à la maison. O, evə gedir.
Les enfants viennent du stade. Uşaqlar stadiondan gəlirlər.
D'où les enfants viennent-ils?
D'où est-ce que les enfants viennent? – Uşaqlar haradan gəlirlər?

11. Səbəb zərfi (L'adverbe de cause):

Pourquoi ?- Nə üçün?
Sabir va à la boulangerie pour acheter du pain. – Sabir çörək almaq üçün çörək mağazasına gedir.
Pourquoi Sabir va-t-il à la boulangerie?
Pourquoi est-ce que Sabir va à la boulangerie? – Sabir nə üçün çörək mağazasına gedir?

6. Saata verilən sual:

A quelle heure ?- Saat neçədə ?
Nos leçons commencent à 8 heures. Bizim dərslərimiz saat 8-də başlayır.
A quelle heure vos leçons commencent-elles? – Sizin dərsləriniz saat neçədə başlayır?

7. Combien de?- Neçə? Nə qədər?

Bu saya verilən sualdır. Bu söz həmişə cümlənin başında gəlir və ondan sonra gələn isim cavabdan asılı olmayaraq həmişə cəmdə olur.
Deux garçons entrent dans la chambre.- İki oğlan otağa daxil olur.
Combien de garçons entrent-ils dans la chambre? Neçə oğlan otağa daxil olur?
Combien de sualını verərkən aşağıdakıları nəzərə almaq lazımdır.

12. Əgər say mübtədaya aiddirsə, onda söz sırası dəyişmir.

Quatre pommes sont sur la table. Dörd alma stolun üstündədir.
Combien de pommes sont sur la table? Neçə alma stolun üstündədir?

13. Əgər say tamamlığa aiddirsə, bu zaman söz sırası dəyişir, yəni inversiya olunur.

Il prend quatre pommes. O dörd alma götürür.
Combien de pommes prend-il? O neçə alma götürür?

8. Təyin (Attribut)

Quel? Quels? Quelle? Quelles? – Hansı? Necə?

14. Əgər təyin mübtədaya aiddirsə, bu zaman söz sırası dəyişmir.
Un vieil homme entre dans la salle. – Bir qoca kişi zala daxil olur.
Quel homme entre dans la salle? Hansı kişi zala daxil olur?
15. Əgər təyin tamamlığa aiddirsə, bu zaman inversiya olunur.
Il ramasse de jolies fleurs pour sa maman. – O, anası üçün gözəl güllər toplayır.
Quelles fleurs ramasse-t-il pour sa maman?- O, anası üçün hansı gülləri toplayır?

9. İsmi xəbərin ad hissəsinin sualı (prédicat nominal)

16. Əgər ismi xəbərin ad hissəsi isimdirsə bu zaman ona **“Qui?”** sualı verilir.
Il est professeur. O müəllimdir.
Qui est-il? O kimdir?
17. Əgər ismi xəbərin ad hissəsi rəng bildirən sifətlə ifadə olunubsa bu vaxt ona:
De quelle couleur? Hansı rəng? sualı verilir.
Cette robe est bleue. Bu don mavidir.
De quelle couleur cette robe est-elle? Bu don nə rəngdədir?
18. Əgər ismi xəbərin ad hissəsi keyfiyyət bildirən sifətlə ifadə olunubsa bu zaman ona:
Comment? Necə? sualı verilir.
Ce livre est très intéressant. Bu kitab çox maraqlıdır.
Comment ce livre est-il? Bu kitab necədir?

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GLORIFICATION OF MOTHERLAND MOTIVE IN MAHIRE NAGHIGIZI'S POETRY

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ABSTRACT

The purpose of this study is to show the reader that the Azerbaijani literature, which has an ancient and centuries-old history, is characterized by its richness in form and content in all periods, that it brings historical events to the lyrical, epic and dramatic level of fiction, and that in these literary examples, the reader celebrates the motives of moral purity, loyalty to the motherland, struggle, respect and reverence. to bring to his attention. Since the 80s of the 20th century, topics such as the pain of Karabakh, loss of land, and longing for the homeland occupy the main place in Azerbaijani literature. Our literature has not remained indifferent to this in a period where we have been losing our historical lands for more than two centuries. Mahira Naghi gizi Huseynova, who combines the intelligence of literature and science, is a poet, linguist-scientist of this kind. Mahira Naghigizi has a high innovative ability as a contemporary Azerbaijani poet. Because in his artistic creativity there are examples suitable for the event of every period. During the 44-day Patriotic War, Mahira Naghigizi created brilliant examples of "victory literature" not only in her poetry, but also in her scientific and journalistic works. In this article, first of all, the anxiety of a citizen poet is described in the poetry of Mahira Naghigizi, and the heartbeat in her poems about victory, which she wrote in the days of the Patriotic War at the end of the 20th of the 20th century.

Key words: homeland, victory, national spirit, independence, West Azerbaijan, contemporary period, Azerbaijani literature, poetry, etc.

Azerbaijani literature, which has a centuries-old history, has been characterized by its richness in terms of content and form in all periods, artistic examples that bring historical events to literature on a lyrical, epic, and dramatic level reflect the past, struggle, pain, loss, and way of life of the people. Even in examples of oral folk literature, the word served to educate the motives of human spirituality, moral purity, loyalty to the motherland, struggle, respect, and reverence. In the written literature, the poets and writers gave more space to human subjects than to glorify individual emotions, glorified the common deed, national values, the greatness of the people, the ideas of Azerbaijanism in every work they created, and bore witness to history with poetic words. Since the 80s of the 20th century, topics such as the pain of Karabakh, loss of land, and longing for the homeland occupy the main place in Azerbaijani literature. At a time when we have been losing our historical lands for more than two centuries, our literature has not remained indifferent to this and has reflected the inner face of Soviet ideology and the horrors of Armenian vandalism in artistic works. Our nation entered national independence with the pain of Karabakh. Therefore, the themes of patriotism, Karabakh and war occupied the main place in the poetry of the transitional period. In particular, the events of January 20, 1990 left certain traces in our poetry. B. Vahabzade wrote the poem "Martyrs", Nabi Khazri "A boy running away from the front", Jabir Novruz "Protect yourself my people", Mammad Aslan "Cry carnation, cry", Isa Ismayilzade wrote a poem and poems called "Haran agarhyir vatan". There is one idea that unites all these works: to protect the motherland, not to allow it to be divided, to strengthen our independence. Mahira Naghigizi Huseynova, who combines the intelligence of literature and science is a poet, linguist-scientist of this kind. Although she was born and grew up in Nakhchivan, the generation to which

Mahira Khanum belongs, originally from the great land of Azerbaijan, has gone down in history with her national spirit and social and moral qualities. From this point of view, we can say that each of the steps that Mahira Naghigızı took today's decision stems from the root. At the same time, Hasan Mirzayev, a well-known public figure and scientist who is a researcher of folklore, dialectology and toponymy of Darelayaz district, had a great influence on Mahira khanum's artistic and scientific path. Mahira Naghigizi has a high innovative ability as a contemporary Azerbaijani poet. Because in her artistic works there are examples suitable for the events of every era, and our respected poetess almost did not leave out any topic in her collection: love of God, love of Motherland, love of mother, father, family, children and grandchildren, respect for our martyrs, joy of our great victory , as well as deep respect and gratitude to professions and profession owners, emotions and other topics form the main plot of Mahira's poems.

Today, as one of the artists who keep the history of the Motherland alive in the magic of words and at the same time as a well-known representative of contemporary Azerbaijani poetry, Mahira Naghigizi works tirelessly in the harmony of artistic creativity and scientific creativity. Mrs. Mahira has not shared her love for poetry with anyone since the day she picked up a pen. Mahira Huseynova, whose creative credo is motherland, nation, Azerbaijaniism, turned her pen into a weapon during the Second Karabakh War. The poet added a poem to the wise policy of the Commander-in-Chief. Mahira khanum wove a wreath of words to our lands freed from Armenian occupation, she walked around those places mixed with words, and her poems of victory turned into songs of victory. In the Great Patriotic War of 1941-45, S. Vurgun called "Let the motherland know, let the Motherland hear", S. Rustam's "Let the day be the day that the fight ends", A. Vahid's "Get out, you bloodthirsty predator, get out of our land" , during the 44-day Patriotic War, Mahira Naghigizi created bright examples of "victory literature" not only in poetry, but also in her scientific and journalistic creativity. In Mahira Naghigizi's poetry, above all, the concerns and heartbeats of a citizen poet are heard. The poet, who loves to praise the motherland's spring, summer, flowers, mountains, stones, and rains, writes poems about victory in the days of hard trials - the days of the Patriotic War at the end of the 20th century. The horrors of the 44-day Patriotic War, Armenian ingratitude, betrayal, bravery of brave sons shielding their chests from enemy bullets, the greenness of bombed homelands, the moans of babies, the moans of mothers, the revenge of peaceful residents turned into poetry in the poet's poems.

Martyrs who died for the motherland, the land and the motherland and rose to the top of martyrdom form the leitmotif of Mahira Naghigizi's poetry. The main line, leading, guiding element of his poetic creation, his soul is the subject of the Motherland, nation and Martyrs. This is not accidental. The peak of martyrdom is the highest peak for the Islamic community and the Turkish nation. The poet's poem "A sheet written yesterday" dedicated to the Tovuz martyrs is a sad cry for the brave sons of Azerbaijan who died for the homeland. The synonyms "fate", "destiny", "measure", "fresh" and "sweat" are lexical units used in place for the exact expression of the idea, which express the poet's heartbeat and sad lyrical self.

Life is also fate, destiny, alas,
The amount, the size - if you want, if you want...
Love is sown, see how, God,
Fresh, sweat like flowers, on the graves.

In his poem "Khojaly", the poet who always expressed the tragedies of January 20, Khojaly in a poetic language with a deep sense of sadness, uses the words of the adjective part of speech within one line so masterfully that the semantic capacity of those words creates a synonymous row effect.

Peaceful, unarmed men,
It was a dead end.
Those in Khojaly,

It was a merciless spectacle.

Mahira Naghigizi's poetry contains such poems that the reader cannot get out of the spell of those poems, the verses enchant a person, the content makes the reader wander between reality and dream. These verses are an example of creativity born from thirty years of longing. The echo of these magnificent verses from the steep rocks of Shusha strengthens the reader's opinion that "this is reality, not a dream, not a dream, this is the victory of the Azerbaijani people, the confirmation of our national existence, the artistic embodiment of the historical victory of Commander-in-Chief Ilham Aliyev", conquering the heart of the reader whose heart beats with longing for Shusha.

Each one stood up like a mountain,
They put their chests in front of the enemy.
Like a spear from the bosom of the night,
They squeezed and stung the enemy's roots.

In Mahira Naghigizi's poems dedicated to the Motherland, the integrity of the Motherland, and the greatness of the Motherland, the selflessness of the love of the Motherland is at the same level as the hatred of the enemy is at a level higher than the meaning expressed by the word. That's why the poet's poems with the call "get ready for the last battle" (as well as the theme) attract more attention in his poems expressing patriotic feelings and instilling hatred for the enemy. Poems of this type are characteristic in terms of reflecting the poet's national feeling and national desire:

The Azerbaijani soldier will go to Shusha,
Prepare for the final battle for that march!
Waiting Lachin, Zangilan, Kalbajar,
Get ready for the final battle for the ultimate reunion!
You are the strength of the Motherland, the soldier son of the motherland,
The motherland does not call, does not leave every son,
Girls decorate with flowers son of victorious,
Prepare for the final battle for that arrival!

In general, the poetry created in the stone truths of her petrified views on all topics addressed by Mrs. Mahira creates such attractive and wonderful scenes that the reader is not just a guest in her world; he participates in the creation of this world as closely as the poet himself, he is aware of the place of each detail. Each stanza of the poem "Motherland" is a living stroke that expresses the features of the image of the Motherland, and you can not only see the portrait given life by those strokes, but you can even talk to this portrait:

This is not the land called motherland
Next to the mother's knee is the motherland.
If you have a chest to lay your head on,
If it is the cradle of your soul, know that it is the motherland.

A lot has been written about the homeland in Azerbaijani poetry, and it has been presented with the most diverse means of expression, and the possibilities of new words and new presentations about it seem to have run out, but in the first stanza of the poem, Ms. Mahira Naghigiz's poem shows the boundlessness of the emotions of the human heart, as well as the wide range of ideas that express those emotions for the reader. reinforces the conclusion about the limitlessness of word possibilities. Of course, in addition to the above, against the background of these important factors, it is impossible not to feel and express the motives of West Azerbaijan in Mahira Huseynova's work.

Mahira Huseynova's "Linguopoetics of onomastic units in the work of Azerbaijani Ashiq and El poets of the 19th-20th centuries (on Daraleyaz district)", "Modern Azerbaijani language: On the teaching of dialectisms in the works of Ashiq and El poets (on Daraleyaz district)", "Modern

Azerbaijani language: Ashiq and El "Language and stylistic characteristics of the creativity of el poets (on Darelayaz district)" and other scientific works in the scientific heritage of the professor Western Azerbaijan is a clear example of how wide the topic is. However, her monograph "Linguistic etymological analysis of Western Azerbaijani paleotoponyms" published in October of this year is once again an example of the loyalty of Mahira Naghigizi, one of the pioneers of Azerbaijani science, to the political line of our state, and also a proof of her love for her roots. One of the most interesting points in these examples of poems written in clear, flowing, pure Azerbaijani language on various topics is the manifestation of Western Azerbaijani motives.

How can I get out of here?
Is there a grudge against the fugitive rock, is there prejudice?
I don't have the strength to go during the day,
There is Darelaez I saw in a dream.

In the eyes of Mahira Naghigizi, everywhere we look is beautiful: the peaks of Shahdag warmed by eternal ice caps, the Talish mountains of Lerik, Hasannana, Hasanbaba, Khasbulag standing in pairs, the Alagols of Kalbajar on the other side, the forests of Ilisu, which keep their wisdom mysterious, the bare Khizi mountains... From Shusha two or three steps on the other side, Karabakh, which creates wonderful landscapes with the fauna of more than two thousand plant species, starting from the "Khari-Bulbul" flower in the branches of the Topchu forest, all this is the area of that beauty that appears in poems. To be sure that this beauty is the source of poetry, it is enough not to stand in front of the magnificent scenes created by the plains and river valleys presented by Mrs. Mahira, but to look at them. Then, we descend from the snow-covered high peaks of the Murovdag mountain range and call Kura, its tributaries Tartar, Khachin, Gargar, as well as Araz and its tributaries Kondelanchay, Guruchay, Chailagchay, and reach the Kura-Araz plain. We see Azerbaijan opening up in front of us like a book that will be a companion to our dreams that we come across at every moment. That Azerbaijan, about which thousands of poems have been written and songs have been composed:

Azerbaijan-
Above the rocks,
Younger than my age
Older than the world.
Azerbaijan-
The high tide of the Caspian Sea.
My people’s struggle to live for thousands of years.

This is the same Azerbaijan, the kingdom of Fire, whose history we learn from history books, which was the Homeland of struggles to the end to stand on our feet, to get out of life-and-death battles; The land turned into a trench with the graves of martyrs, the flag painted crimson with the blood of veterans, the land where the people who became the owners of the nation with the wisdom of independent men made a hearth. This is that Azerbaijan, and Mahira Naghigizi's lyrical "I" reminds us of the troubles of that land, which she is proud of with its history, pain, and victories, and visits complete and whole Azerbaijan as the greatest temple:

Azerbaijan-
God to whom I bow.
Help you
My mother's prayers.

The poems of Mahira Naghigizi, distinguished in modern Azerbaijani literature by her spirit and writing manner, are not only about the Motherland, its nature, borders, attributes, but about people who understand the essence of those attributes. About those people who understand the essence of the concept of the Motherland, not intuitively, but consciously, and are ready to make any sacrifice for it. For them, Azerbaijan's mountains, valleys, deserts, forests, its blood vessels,

rivers, and the sea are valuable for them, and this is not because each of the listed is a source of life separately, but because each of them feels that they are a part of this existence. Readers can clearly see what heroism and bravery originates from, and what is at the root of these qualities, which are as old as human history, in Mahira Naghigizi's views and her creative examples.

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LEXICAL INNOVATION THROUGH NEOLOGISMS

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Abstract
The article scrutinizes the linguistic phenomenon called "lexical innovation" via neologisms. Neologisms appear in the language in different ways. One of the formation ways or means of lexical innovation is via neologisms. Neologisms which are sometimes called coinages are often fabricated by celebrities or common people. The spread of neologisms is usually carried out through mass media which includes television, radio, newspaper, social sites, social platforms, etc. Furthermore, the article compares similar terms such as protologisms, prelogisms and nonce words with neologisms. They were analyzed in terms of constancy and acceptance. The author came to such a conclusion that each coined word does not receive the status of being "neologism". For this, the word or phrase should be registered in the dictionary and accepted or used by public.
Key words: neologism, protologisms, prelogisms, nonce words, register

Lexical innovation is carried out in different ways in linguistics. One of these ways contains neologisms which is considered to be very productive. Neologisms derive either from the words of mother tongue origin with mixed suffixes and prefixes or loan-words. Neologisms are sometimes formed via morphological calques which are based on word for word translation from the native language into the target language.

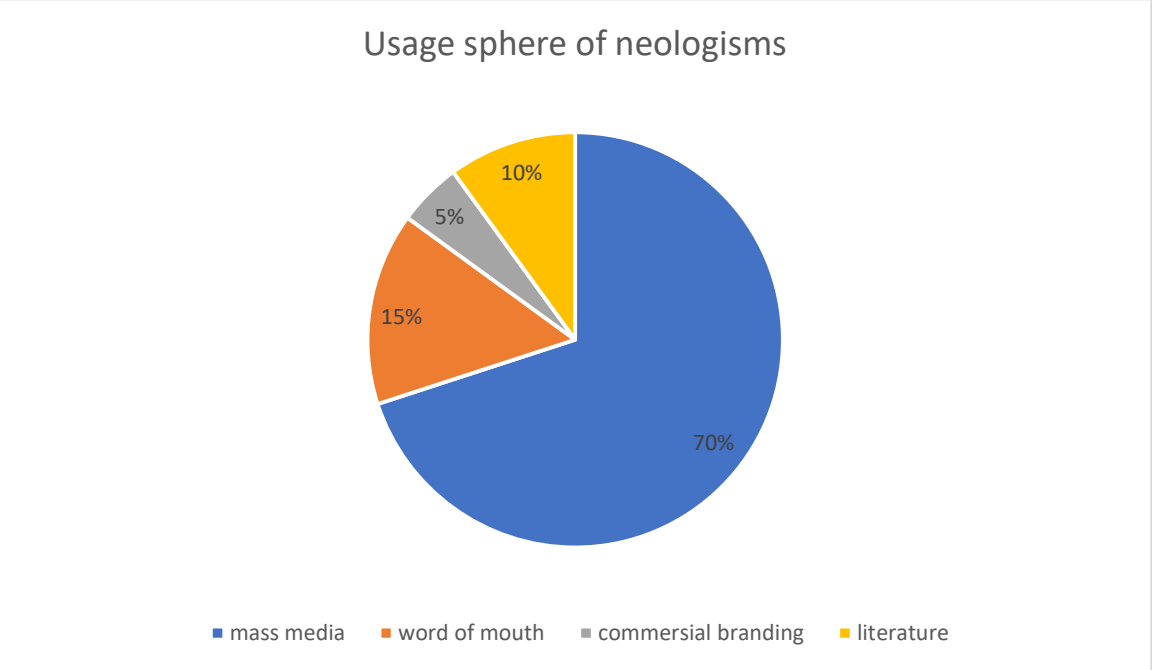
Neologisms which are also known as a coinage is considered to be any newly formed word, term or phrase which has achieved popular or institutional recognition and is accepted into mainstream language [1]. Neologisms are coined or fabricated either by celebrities or some certain individuals including scholars, writers, politicians, linguists, etc. Therefore, its another name is coinage. Once a new word is published in the dictionary and accepted or used in public on a large scale, the word is regarded neologism [10].

Neologisms are one of the means of lexical innovation which is a linguistic process observed with new words entering word stock of a language. Neologisms differ from some other similar terms as nonce word, protologism, prelogism.

Nonce words are the words used only once which may or may not become famous in public. Protologisms are used by a small group of people like argots. Prelogisms are the terms which are being used but not extensively. Unlike all above-mentioned terms, neologisms are accepted or recognized by social institutions [2]. We can come to such a conclusion that every newly emerged word cannot get the status of "neologism". It is proven by its acceptance and constant usage in public. Moreover, it must be recognized and registered by the relevant institutions which make decisions and compile dictionaries [4].

Neologisms often undergo changes in technology and culture [8]. Usage sphere of neologisms encompasses literature, mass media including television, films and clips, technology, science, jargon, commercial branding, science fiction, visual arts and popular culture. The best example for neologisms is the word "Laser" which is the contracted form of "light amplification by stimulated emission of radiation".

Pie chart 1



The pie chart given above shows the usage sphere of neologisms according to a survey among 100 respondents in public. As obvious, there are 4 categories where neologisms are supposed to spread among which we see mass media, word of mouth, commercial branding and literature. As seen from the pie chart, the biggest space is occupied by mass media comprising 70%. Mass media includes television, radio, newspapers, social platforms and social sites on the internet. It means that 70 participants confirmed that neologisms spread through mass media. Then it is followed by word of mouth which makes up 15%. It is based on rumours and gossips which the people speak confidentially. They are not usually shown on the mass media. Only 10 respondents claim that neologisms spread by means of literature. As fictions are read by fewer people, it constitutes only 10%. The smallest portion on the pie chart belongs to commercial branding with 5% which regards advertising of famous goods.

Neologisms can be structured in different forms:

1. By combining existing words
2. By blending words
3. By abbreviating the words
4. Through acronyms
5. By intentional rhyming of words

Neologisms can be widely spread by means of mass media, social networking sites such as Instagram, Facebook, Tiktok, Stumble upon, as well as word of mouth in public. First, such words play the role of argots then they become jargons or slangs in society [3]. The final step is the acceptance by the society and inclusion in dictionary. Some neologisms fall out of use shortly after they appear in the language. A real neologism goes on to be a part of the language when it is accepted then used by the public.

Neologisms can also be spread by Cant language. Cant language in its turn has some sub-forms such as Polary and Verlan. Polary is usually used by some actors or actresses, circus professionals and gay subculture. These social strata communicate so that no one understands them. Some Polari words have already gained the status of mainstream slangs. These terms can be met even in some pop and rap song lyrics. For instance, rough trade, strides, tod, butch, hoofer, ogle, scarper, etc.

Verlan is a type of argot used in French language. It emerges as a result of inversion of syllables in the word which is mainly used in youth language. It is a way of creating slangs by transposing syllables of words which is based on long French tradition [6]. For example, meuf is a

verlan word which is structured by saying the word “femme-woman” in reversed order. The aim of verlan is to create a secret language that only speakers can guess.

As we know, neologisms can spread by advertising of brand names in mass media. Moreover, it is possible to see them on posters stuck on big trucks or cars, in front of public and private shopping centers, on street walls, and in many other places. In order to enlarge the amount of sales and take profit, some celebrities such as singers, actors or actresses participate in the advertising. These celebrities uttered “coke” instead of “Coca-cola”. Hence, in this way, the neologism “coke” emerged and spread rapidly.

Translation also brings about the spread of neologisms when the translation is too difficult because of neologisms. In this case, neologisms are transliterated from the source language into the target language. It means that translated word remains the same. For example, In Danish the word “papvin” which literally meant “a bag-in-box wine” did not change in translation. Transliteration happens when the words, phrases, or texts are converted into another language how they are in the original. This process is distinguished by a different script or writing system. Alternatively, the word in English is used along with a short explanation [7]. Loan words which cannot be translated into the target language are usually transliterated. Such words represent specific culture and tradition including meals, drinks, traditional clothes which belong to a specific nation. For example, Italian word “pizza” or Japanese drink “sake” cannot be translated into English. They are transliterated into English with their original pronunciation and script. Linguistic and cultural aspects intersects here [9] Though these two words are traditional in the source language, they can be considered neologisms in English if they are registered in English dictionary. This originality is preserved due to socio-cultural factors in the language [5].

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AZƏRBAYCAN DİLİNİN SİNTAKSİSİNƏ GİRİŞ: 8-9-CU SİNİF ŞAGİRDLƏRİ ÜÇÜN ASANLAŞDIRILMIŞ TƏLİMATLAR

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XÜLASƏ

Bu məqalə 8-9-cu sinif şagirdləri üçün Azərbaycan dilinin sintaksisinə aid əsas anlayışları asan və aydın dildə izah edir. Sintaksisin nə olduğu, cümlə və cümlə üzvlərinin funksiyaları, eləcə də cümlə növləri – sadə, tabeli və tabesiz mürəkkəb cümlələr haqqında məlumat verir. Məqalə həmçinin cümlə üzvləri arasındakı əlaqələrin növlərini və düzgün cümlə quruluşunun əsas qaydalarını sadə nümunələrlə izah edir. Bu qaydalar şagirdlərə cümlələrdə düzgün söz sırasını və ifadəli nitqi formalaşdırmağa yardım edir. Məqsəd, şagirdlərin Azərbaycan dilinin sintaksisinə dair əsas anlayışları daha yaxşı başa düşməsini təmin etmək və onların dil bacarıqlarını inkişaf etdirməkdir. Bu təlimatlar, qrammatikanın əsaslarını öyrənmək və tətbiq etmək üçün faydalı bir bələdçi olacaqdır.

Açar sözlər: sintaksis, cümlə növləri,cümlə üzvləri, cümlə.

INTRODUCTION TO THE SYNTAX OF THE AZERBAIJAN LANGUAGE: SIMPLIFIED INSTRUCTIONS FOR STUDENTS OF 8-9 GRADES

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SUMMARY

This article provides simplified explanations of key concepts in Azerbaijani syntax for 8th and 9th-grade students. It covers the definition of syntax, the roles of sentence components, and the types of sentences — simple, compound (subordinating), and compound (coordinating). The article also explains the types of syntactic relationships between sentence components and outlines essential rules for constructing correct sentences, using simple examples. These rules help students develop accurate word order in sentences and build expressive speech. The goal is to ensure that students better understand the fundamental concepts of Azerbaijani language syntax and improve their language skills. These guidelines will serve as a useful guide for learning and applying the basics of grammar.

Key words: Syntax, types of sentences, sentence components, sentence.

ВВЕДЕНИЕ В СИНТАКСИК АЗЕРБАЙДЖАНСКОГО ЯЗЫКА: УПРОЩЕННАЯ ИНСТРУКЦИЯ ДЛЯ УЧАЩИХСЯ 8-9 КЛАССОВ

Гозел Мустафаева
Мастер АГПУ

РЕЗЮМЕ

В данной статье приводятся упрощённые объяснения ключевых понятий синтаксиса азербайджанского языка для учащихся 8-9 классов. В статье рассматриваются определение

синтаксиса, роли членов предложения и типы предложений — простые, сложноподчинённые и сложносочинённые. Также объясняются типы синтаксических связей между членами предложения и основные правила построения правильных предложений на простых примерах. Эти правила помогают учащимся формировать правильный порядок слов в предложениях и развивать выразительную речь. Цель состоит в том, чтобы помочь ученикам лучше понять основные понятия синтаксиса азербайджанского языка и развить их языковые навыки. Эти рекомендации будут полезным руководством для изучения и применения основ грамматики.

Ключевые слова: Синтаксис, типы предложений, члены предложения, предложение.

GİRİŞ.

Azərbaycan dilində sintaksis cümlənin quruluşunu, sözlərin və ifadələrin cümlədə necə düzülməsini öyrənən bölmədir. Sintaksisin təməl qaydalarını öyrənmək 8-9-cu sinif şagirdləri üçün Azərbaycan dili fənnində mühüm addımlardan biridir. Bu məqalə Azərbaycan dilinin sintaksisini sadə dildə izah edir və şagirdlərə əsas anlayışları başa düşməyə kömək edir.

1. Sintaksis nədir?

Sintaksis Azərbaycan dilinin bölmələrindən biridir.Cümlənin qurulması və sözlərin düzgün istifadəsi qaydalarını öyrənir.Sadə cümlə, mürəkkəb cümlə, tabeli və tabesiz mürəkkəb cümlələr sintaksisin təməl mövzularındandır. Sintaksisin əsas məramı sözlərin və cümlə üzvlərinin bir-biri ilə əlaqəsini anlamaqdan ibarətdir.

Məktəbdə dərs başladı. Bu cümlədə məktəbdə yer zərfi, dərs isim, başladı isə fel kimi müxtəlif qrammatik rollara malikdir [13, s.45].

2. Cümlə və cümlə üzvləri.

"Azərbaycan dilində cümlə üzvləri əsas və yardımçı üzvlərdən ibarətdir. Əsas üzvlər mübtəda və xəbəri, yardımçı üzvlər isə tamamlıq, zərflik və təyinləri əhatə edir.

Mübtəda – Cümlədə işi yerinə yetirən əsas şəxs və ya əşya. Məsələn, "O, məktəbə getdi." cümləsində o mübtədadır [15, s.10].

Xəbər – Mübtədanın işi, hərəkəti və ya vəziyyətini bildirir. Məsələn, getdi xəbər rolundadır [15, s.10].

Cümlə tamamlanmış bir fikri ifadə edən söz və ya söz birləşməsidir. Cümlə üzvləri cümlədə müxtəlif funksiyaları yerinə yetirirlər. Əsas cümlə üzvləri bunlardır:

Mübtəda (Cümlənin qrammatik əsasını təşkil edir. Cümlədə kimin və ya nəyin haqqında məlum edir."kim?" , "nə?", «hara?»suallarına cavab verir).

"Kamran evə çörək aldı" Kamran cümlənin mübtədasıdır. "Kim?" sualına cavab verir.

"Hüseyin Cavid bütün yaradıcılığı boyu bəşəri və milli səadət,sülh və əmin-amanlıq tərəfdarı olmuş, humanist və romantik bir şair kimi müharibələri və onu törədənləri insansevərliyə bəşəriyyətin tərəqqisinə, yüksək ideallara səsləmişdir". Hüseyin Cavid cümlənin mübtədasıdır.

Xəbər (Haqqında danışılan məhfumun hərəkətini yaxud da əlamətini bildirən baş üzvdür."nə edir?", "necədir?" və sair kimi suallara cavab verir)

"Əsəri diqqətlə oxumuş şagird ondan düzgün nəticə çıxarır." Cümləsində nəticə çıxarıs cümlənin xəbəridir. "Nə edir?"

Tamamlıq, təyin və zərflik isə cümlənin yardımçı üzvləridir və baş üzvlərlə bağlı əlavə məlumat verirlər.

3. Cümlənin quruluşca növləri:

Cümlələr quruluşuna görə sadə və mürəkkəb cümlələrə bölünür:

Sadə cümlə: 1 qrammatik əsasdan ibarət cümlələrdir (məsələn: Mən gəlirəm).

Mürəkkəb cümlə: İki və ya daha artıq qramatik əsasdan ibarət olan cümlələrdir. Bu cümlələrin özü də 2 yerə bölünür: tabeli, tabesiz mürəkkəb cümlələr.

Tabeli mürəkkəb cümlə:

Cümlənin tərəflərindən biri digərinə tabe olan mürəkkəb cümlələrdir. Məsələn: “Sən bilirdin ki, biz gecikəcəyik.”

Tabesiz mürəkkəb cümlə:

Belə cümlələrin tərəfləri bərabərhüquqlu olur. Biri digərindən aslı vəziyyətə düşmür. Məsələn: “Mən gəldim, o getdi.”

4. Sintaktik əlaqə növləri:

Söz birləşmələri və cümlə üzvləri arasındakı sintaktik əlaqə iki cür olur:

Tabesizlik əlaqəsi: Sözlər bərabər hüquqlu olub, bir-birinə tabe olmurlar. Tərəflər əsasən sadalanır.

Tabelilik əlaqəsi: Bir cümlə üzvü və ya söz birləşmələrini tərəfləri digərinə tabe olur.

5. Əsas sintaktik qaydalar:

Azərbaycan dilinin sintaksisində əsas sintaktik qaydalar dilin düzgün və anlaşılan qurulmasına kömək edir. Bu qaydalar, cümlə üzvlərinin düzgün sırasını və əlaqələrini təmin edir. Azərbaycan dilində cümlə qurarkən aşağıdakı əsas qaydalara diqqət yetirmək vacibdir:

Cümlə üzvləri arasında düzgün əlaqə qurulması vacibdir. Məsələn:

Subyekt ilə predikat arasında əlaqə, cümlənin mənasının doğru çatdırılması üçün vacibdir.

Predikat hər zaman cümlədəki əsas fəaliyyət və ya vəziyyəti bildirir, buna görə də, hər cümlə predikatla başlayır.

Obyekt, predikatın təsir etdiyi və ya işləndiyi şeydir. Obyektin düzgün sırası və əlaqəsi çox önəmlidir.

Əlaqələndirici sözlərin düzgün istifadəsi

Cümlə üzvləri arasında əlaqə yaratmaq üçün əlaqələndirici sözlərdən istifadə edilir. Bu sözlər aşağıdakılardır:

Bağlayıcılar: və, amma, lakin, çünki, ya, ya da və s.

Məsələn: “Məktəbə gedirəm və dərsə başlamaq istəyirəm”.

Bu cümlədə “və” bağlayıcısı iki sadə cümləni birləşdirir.

Mübtəda və xəbərin uzlaşması: Mübtəda ilə xəbər eyni şəxs və kəmiyyətdə olmalıdır.

Tamamlıqların düzgün istifadəsi: Cümlədə mənanın dəqiqləşməsi üçün tamamlıqlar düzgün istifadə edilməlidir.

Söz sırası: Azərbaycan dilində adətən mübtəda əvvəl, xəbər isə axırda olur.

Düzgün cümlə quruluşunun yaradılması

Düzgün cümlə quruluşu, dilin təbii axışını təmin edir və ifadənin daha aydın olmasına kömək edir.

Cümlədəki söz sırasına və üzvünə görə cümlə düzgün qurulmalı, hərəkət və ya vəziyyətin düzgün çatdırılması təmin edilməlidir.

Nəticə.

Bu məqalədə Azərbaycan dilinin sintaksisinə dair əsas qaydalar 8-9-cu sinif şagirdləri üçün sadə və aydın dildə izah edildi. Bu qaydaların öyrənilməsi şagirdlərə düzgün və ifadəli nitq qurmağa kömək edir. Həmçinin məqalə vasitəsilə şagirdlər Azərbaycan dilinin sintaktik qaydalarını sadə şəkildə öyrənə bilərlər. Azərbaycan dilində sintaksisin əsaslarını anlamaları onların ifadə qabiliyyətini artıracaq və dil biliklərini möhkəmləndirəcəkdir.

Azərbaycan dilinin sintaksisinin əsas qaydalarını başa düşmək şagirdlərin ifadə bacarıqlarını inkişaf etdirmək üçün vacibdir. 8-9-cu sinif şagirdləri üçün sadələşdirilmiş təlimatlar vasitəsilə cümlə quruluşları, cümlə növləri və cümlə üzvləri kimi fundamental anlayışlar daha asan izah edilir. Bu, onların dili daha düzgün və səlis istifadə etməsinə, yazılı və şifahi ifadə qabiliyyətlərini təkmilləşdirməsinə kömək edəcəkdir. Eyni zamanda, sintaksisin əsaslarına dair dərin biliklər şagirdlərin qrammatikanı daha yaxşı mənimsəməsinə şərait yaradır, bu da onların gələcək dil biliklərinə möhkəm təməl qurur

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Biological Sciences

Application of the 7E model to "Nutrients and Digestive System" topic

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By applying the 7E course model in biology teaching, the learning process may be made more effective, meaningful and enjoyable. Applying the 7E model based on a constructivist approach is useful in establishing a strong knowledge base by increasing students' active participation and enthusiasm for learning.

Substandard(s): 1.1.2. Describes the levels of organization of the human body. 3.2.1. Explains health protection rules.
Learning conclusion(s):
• Describes the digestive organs.
• Explains the role of proper nutrition in health protection.
Evaluation criteria:

- Describes the digestive organs.
- Explains the role of proper nutrition in health protection.

Evaluation method: question-answer, mental attack

Brief description of the course of the lesson

The aim of the memorization phase is to determine what students know about the topic to be taught.
How to group food products?
At the stage of involvement, interesting information is told and questions are asked pursuant to it to stimulate interest in the topic.
The ancient Greeks contrived such a legend. Athena Pallas argues with Poseidon, the god of the sea, about who should own Attica. They decide that the one who does the most good will get the land. Poseidon strikes the rock with trident (scepter) and grants life to the river. The beautiful Afina thrusts her spear into the rock and turns into an olive tree. Athena wins the argument.
Students are asked the following questions and involved to discuss.
Why do you think Athens won?
What makes olives so useful?
How is olive used in the household?
At the end of this stage, the aim of the course is stated to the students. The aim of the course is showed on the board.

- Describes the digestive organs.
- Explains the role of proper nutrition in health protection.

The experiment is conducted at the research stage.
Equipment: bread, sugar, potatoes, boiled eggs, walnut kernels, olive oil, iodine, petri dish, dropper (pipette), nitric acid.
The progress of the work. Divide the nutrients between the three groups pursuant to the table below.
Group I - add iodine to substances.

Group II - add sodium nitrate to the egg.
Group III - pour a drop of olive oil on the paper, and put a walnut kernel between the other paper and press it.
Answer the following questions:
• How did the color of potatoes, sugar and bread change?
• Why did the oiled paper become transparent?
• Did the color of the egg change?
• What did you notice on the paper with walnut kernels pressed?
At the explanation stage, the topic is explained using pictures, presentations, etc. Food intake is very important for the body. They contain water, mineral salts, carbohydrates, proteins, fats and vitamins. The amount of these substances in food products is different. Each of them performs several functions. This leads to the protection, growth and development of the body, and the fulfillment of other functions.

At the deepening stage, students are given tasks, and their knowledge about the subject is expanded.

Make sentences from the words given.
1. The main/ mineral/organism/construction.
2. About/water/part/of/our body/2:3.
3. Coagulation/ blood/bones/strengthening/contains/salts/mineral
Think, discuss, and share.
1. How much water should be consumed during the day? How much water do you drink?
2. What should we do to protect our health?
The 3-2-1 method is applied during reflection. By analyzing the answers, a strategy is determined to meet the needs of the students in the next lesson.
At the improvement stage, students are given the task of researching the importance of food consumed during the day.

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ISOLATION AND CHARACTERIZATION OF SALMONELLA STRAINS CIRCULATING IN POULTRY FARMS OF THE REPUBLIC OF KAZAKHSTAN

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ABSTRACT

This study investigates the isolation and characterization of *Salmonella* strains circulating in poultry farms across Kazakhstan, focusing on the pressing issue of antibiotic resistance. Salmonellosis, a significant public health concern, particularly in poultry farming, poses risks to both animal and human health due to the zoonotic transmission of resistant strains. Employing a combination of classical microbiological techniques and modern molecular methods, including selective media and MALDI-TOF mass spectrometry, the study identifies six *Salmonella* strains and assesses their resistance profiles against 30 antimicrobial agents. Results reveal alarming resistance, especially in multidrug-resistant (MDR) strains such as *S. paratyphi* C, highlighting a critical need for revised antimicrobial strategies in veterinary practice and public health. The findings underscore the importance of continuous surveillance, stricter regulations on antibiotic use in agriculture, and the exploration of non-antibiotic infection control methods. This research contributes vital data to the understanding of antibiotic resistance patterns in Kazakhstan, emphasizing the collaborative efforts required to combat this growing threat to public health and agricultural stability.

Keywords: Salmonella, poultry farms, Kazakhstan, strain isolation, antibiotic resistance, food safety.

Introduction

Salmonellosis is a significant public health concern, especially in the poultry industry, where pathogens of the genus *Salmonella* can cause severe illnesses in humans through contaminated food, particularly poultry meat and eggs. In Kazakhstan, where poultry farming plays a vital role in agriculture, the issue of salmonellosis is particularly pressing. According to the World Health Organization (WHO, 2023) [1], millions of cases of salmonellosis are reported globally each year, many of which are linked to the consumption of animal products, especially poultry.

In his address to the National Council for Science and Technology on April 12, 2024, President Kassym-Jomart Tokayev emphasized the importance of scientific advancements in addressing both immediate and long-term challenges. A critical focus is combating the growing threat of antibiotic resistance in foodborne pathogens like *Salmonella*. Recent studies in Kazakhstan indicate an increasing resistance of *Salmonella* strains to critical antibiotics, highlighting the urgent need for scientific innovations to tackle this issue, which is crucial for public health and economic stability (Mendybayeva et al., 2022) [4]; (Latypova et al., 2024) [5]; (Mendybayeva et al., 2023) [6].

The problem of salmonellosis remains acute in Kazakhstan's poultry farms due to intensive production practices and high risks of contamination. The rising resistance of *Salmonella* strains to antibiotics complicates treatment options and undermines the effectiveness of antimicrobial strategies in both veterinary medicine and human health. To effectively combat salmonellosis, a comprehensive study of circulating strains, their pathogenicity, and their resistance to antimicrobial agents is essential, which is the goal of this research.

Literature Review

In the context of *Salmonella* research, much attention has been directed towards both isolation techniques and antibiotic resistance patterns. Isolation of *Salmonella* strains from various sources, including food products, animals, and environmental samples, is a critical step in understanding the prevalence and transmission dynamics of these pathogens.

Aziz (2022) examined the isolation and identification of multidrug-resistant (MDR) *Salmonella Typhi* from various food products in the Peshawar district of Pakistan. His study utilized selective culture media and biochemical tests, identifying *Salmonella* strains that exhibited resistance to multiple antibiotics, underscoring the importance of rapid and accurate isolation techniques in areas with high disease prevalence [2]. Additionally, Chen et al. (2020) conducted a comparative analysis of *Salmonella* isolation on different brands of chromogenic medium. Their findings reveal that the performance of different chromogenic media can vary significantly, which has important implications for laboratories attempting to identify *Salmonella* quickly and accurately across various food sources. Chromogenic media are critical tools for isolating *Salmonella* due to their ability to differentiate bacteria based on color changes, helping reduce false positives and speeding up identification processes [3].

As isolation methods improve, the concurrent rise of antibiotic resistance among *Salmonella* strains poses significant challenges to both public health and the agricultural sector. Recent studies have documented the alarming rise in antibiotic resistance among *Salmonella* strains in Kazakhstan, particularly in connection with the agricultural and food production sectors. This increasing resistance is a pressing issue both locally and globally, as it threatens public health, the agricultural economy, and the effectiveness of current treatment protocols. For instance, the research by Mendybayeva et al. (2022) reveals a significant prevalence of antibiotic-resistant enterobacterial pathogens, highlighting the need for ongoing surveillance in Northern Kazakhstan. Their study analyzed a wide range of samples collected from poultry farms and processing plants, finding that over 60% of *Salmonella* strains exhibited resistance to common antibiotics such as tetracycline and streptomycin. These findings underscore the urgency of continuous monitoring and preventive measures, especially in regions heavily dependent on poultry farming for economic stability [4].

Similarly, Latypova et al. (2024) analyzed the sensitivity and resistance patterns of Enterobacteriaceae isolates from animal products in the Almaty region, revealing significant regional variations in resistance profiles. Their data shows that isolates from urban areas were less resistant compared to those from rural farms, where antibiotics are often used indiscriminately. Specifically, 70% of the isolates were resistant to ampicillin, and over 40% showed resistance to quinolones, indicating a potential overuse of antibiotics in rural agricultural practices. Latypova's research calls for stricter regulations on antibiotic use in animal farming, particularly in smaller-scale farms that may not follow best practices for antimicrobial management [5].

Additionally, the findings from Mendybayeva et al. (2023) on *Salmonella enterica* strains isolated from poultry products further reinforce these concerns, revealing widespread resistance to multiple antibacterial agents. Their research showed that *S. enterica* strains from commercial poultry sources exhibited resistance to at least three different classes of antibiotics, with the most concerning rates of resistance observed for fluoroquinolones and cephalosporins, which are

typically considered last-resort treatments for bacterial infections in humans. Mendybayeva et al. recommended a reevaluation of national antibiotic policies in food production, as well as the development of alternative methods for controlling bacterial infections in livestock [6].

At the international level, antibiotic resistance in *Salmonella* has become a critical issue of concern. A United Nations report (2023) warns that without effective measures to control antibiotic use in both agriculture and medicine, antibiotic-resistant strains could cause millions of deaths annually by 2050. This report emphasizes that the overuse of antibiotics in food production is a primary driver of resistance, urging countries to adopt stringent regulations on antibiotic application in livestock and poultry farming. The report also highlights the need for global surveillance programs to track the spread of resistance, particularly in developing regions where antibiotic use is less regulated [7].

The issue of antibiotic resistance, particularly in agricultural settings, is also echoed in other global studies. For example, recent research in Europe and North America shows a similar trend in the rise of multidrug-resistant *Salmonella* strains, especially those associated with intensive livestock farming. These studies underline the importance of international collaboration and knowledge exchange, particularly in terms of implementing best practices for antimicrobial stewardship and improving diagnostic technologies to quickly identify resistant strains.

Methods and Materials

To achieve the research objectives, a combination of classical microbiological techniques and modern molecular approaches is utilized. This allows for the effective isolation, identification, and characterization of antibiotic resistance in *Salmonella* strains.

Bacterial isolation is performed using selective media such as LB agar and bismuth-sulfite agar, both of which promote the growth of *Salmonella* while inhibiting unwanted microbial contaminants. Following incubation, colony morphology is examined, and Gram staining is conducted to confirm the presence of bacteria and provide initial insights into their structural characteristics. Microscopy is employed at this stage to investigate the shape, size, and arrangement of the cells, ensuring that they match the expected morphology for *Salmonella*. These microbiological methods provide a foundation for the isolation and preliminary characterization of bacterial strains from the samples.

After successful isolation, biochemical methods are employed to further confirm the identity of the strains. Biochemical tests, such as sugar fermentation and hydrogen sulfide production, are conducted to assess the metabolic capabilities of the bacteria. These tests help differentiate *Salmonella* from other bacteria based on their specific biochemical reactions. The results are compared with known reference profiles to confirm the bacterial identity, complementing the initial microscopic and morphological data.

For precise species-level identification, MALDI-TOF mass spectrometry is used. Colonies grown on selective media are subjected to MALDI-TOF analysis, a technique that profiles the unique protein patterns of bacterial cells. A sample of the bacterial colony is placed on a MALDI plate, treated with a matrix solution, and analyzed by the mass spectrometer. This generates a protein fingerprint for each strain, which is compared to a database of known bacterial spectra. The high accuracy and speed of MALDI-TOF allow for rapid identification of the bacterial strains, providing an efficient alternative to more time-consuming biochemical tests.

To evaluate the antibiotic resistance of the isolated strains, the Kirby-Bauer disk diffusion method is employed following EUCAST (European Committee on Antimicrobial Susceptibility Testing) guidelines. Bacterial suspensions are spread evenly onto Mueller-Hinton agar plates, and antibiotic-impregnated disks are placed on the agar surface. After incubation, the zones of inhibition around each disk are measured to determine whether the bacteria are susceptible,

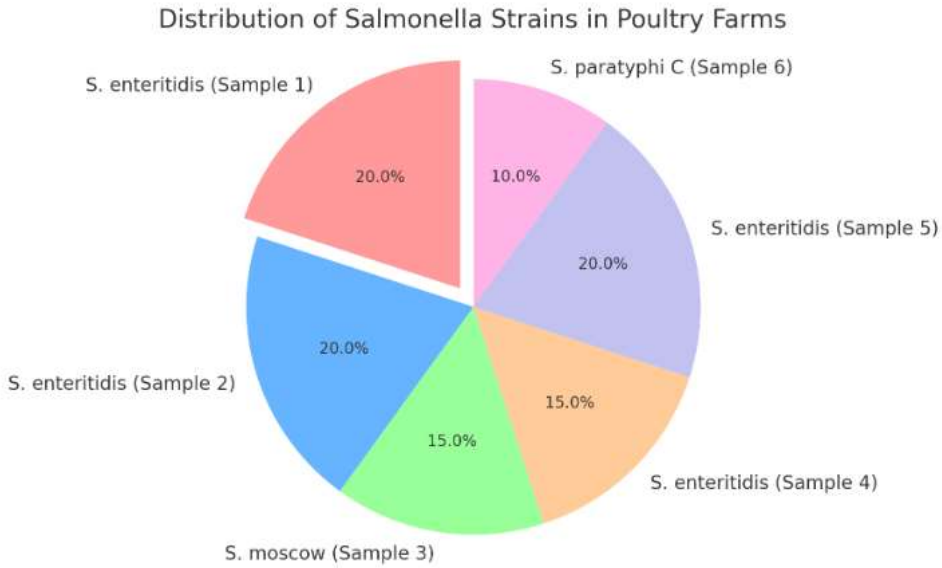
intermediate, or resistant to the antibiotics. The results are interpreted according to EUCAST standards, providing valuable information about the resistance profiles of the *Salmonella* strains.

By combining these microbiological, biochemical, and molecular techniques, the study achieves accurate strain identification and develops an understanding of the antibiotic resistance patterns present in the *Salmonella* strains.

Results

This study focused on six *Salmonella* strains, each of which was tested for susceptibility to 30 antimicrobial agents. The strains exhibited various degrees of resistance, with some showing sensitivity to key antibiotics.

- *S. enteritidis* (Sample 1): This strain displayed resistance to rifampicin, azithromycin, cefotaxime, and amoxiclav, while remaining sensitive to amikacin, ampicillin, ceftriaxone, and gentamicin. Despite significant resistance, therapeutic options like these antibiotics can still be effective.
- *S. enteritidis* (Sample 2): This strain exhibited resistance to similar antibiotics as 1, but also showed higher sensitivity to co-trimoxazole and amoxicillin, indicating variability in resistance even among strains of the same species.
- *S. moscow* (Sample 3): This strain demonstrated resistance to a broader range of antibiotics, including rifampicin, azithromycin, and cefotaxime. However, it remained sensitive to ceftriaxone, ciprofloxacin, and gentamicin, suggesting some treatment avenues are still viable.
- *S. enteritidis* (Sample 4): This strain showed high resistance to azithromycin, erythromycin, and cephalosporins. However, it was sensitive to ceftriaxone, cefotaxime, and amikacin, consistent with other strains.
- *S. enteritidis* (Sample 5): This strain exhibited resistance to rifampicin, erythromycin, and tetracycline but had the highest sensitivity among the tested strains. It was sensitive to 9 out of the 30 antibiotics, including amikacin, ampicillin, and gentamicin.
- *S. paratyphi* C (Sample 6): The most resistant strain in this study, it showed resistance to 14 of the 30 antibiotics, including tetracycline, azithromycin, and vancomycin. It remained sensitive only to amikacin, ceftriaxone, and gentamicin, making it the most challenging strain for treatment.



Despite the widespread resistance observed, antibiotics like amikacin, ceftriaxone, ampicillin, and gentamicin remained effective against all strains, highlighting their potential importance in future therapeutic strategies. Notably, *S. enteritidis* (5) showed the highest

sensitivity, while *S. paratyphi C* (6) exhibited the most extensive resistance, underscoring the variability in resistance even within similar pathogen types.

Discussion

The findings of this study underscore the increasing threat posed by antibiotic-resistant Salmonella strains in Kazakhstan's poultry farms. The resistance of all isolated strains to critical antibiotics, such as tetracycline and rifampicin, raises serious concerns for both veterinary and public health. These results align with prior studies from Northern Kazakhstan, which reported a significant prevalence of multidrug-resistant Salmonella in poultry farming.

One critical observation is the high level of resistance exhibited by *S. paratyphi* C, which may suggest either overuse or inappropriate use of antibiotics in poultry farms, especially in rural or less-regulated regions. The widespread resistance to first-line antibiotics, such as ampicillin and amoxiclav, is alarming and suggests the need for stricter regulatory measures in antibiotic usage within the agricultural sector.

Comparisons with studies in other regions, such as Europe and North America, reveal similar trends in multidrug resistance, particularly in intensively farmed livestock. This international context highlights the importance of adopting global best practices, such as antibiotic stewardship programs and stricter controls on the use of antimicrobial agents in farming.

Moreover, the discovery that *S. enteritidis* strains still retain sensitivity to key antibiotics such as ceftriaxone and gentamicin offers some hope for future treatment strategies. However, the increasing resistance to newer generation antibiotics, like fluoroquinolones, suggests that more innovative approaches, such as bacteriophage therapy or the development of novel antimicrobial agents, might be necessary.

Conclusion

This study provides critical data on the antibiotic resistance patterns of Salmonella strains in poultry farms across Kazakhstan, focusing on the emergence of multidrug-resistant (MDR) strains, particularly *S. paratyphi* C. This finding underscores the urgent need for revised antimicrobial strategies in veterinary practice and public health management, as resistant strains pose a threat to both animal health and human populations through potential zoonotic transmission.

The literature review highlights the global concern over antibiotic resistance, citing studies by Aziz (2022) and Chen et al. (2020) that emphasize effective methods for isolating *Salmonella* from food products. These studies indicate that variations in isolation media can significantly affect the detection of resistant strains, reinforcing the necessity for standardized protocols in Kazakhstan to ensure consistent surveillance.

The methodologies used in this study, especially the application of selective media and MALDI-TOF mass spectrometry, refine isolation techniques, providing reliable and rapid identification of *Salmonella* strains. MALDI-TOF offers substantial advantages over traditional biochemical methods, enhancing pathogen identification reliability in antibiotic resistance surveillance. Complementary to these methods, the disk diffusion technique for antibiotic susceptibility testing adheres to EUCAST recommendations and aligns with global trends of increasing resistance in agricultural settings.

The findings emphasize the need for continuous surveillance and stricter regulation of antibiotic use in agriculture. The emergence of MDR strains like *S. paratyphi* C complicates treatment and raises concerns about the horizontal gene transfer of resistance traits. This suggests that targeted interventions at the farm level, along with educational programs for farmers on judicious antibiotic use and alternative infection control methods, are crucial.

Future research should explore the genetic mechanisms behind antibiotic resistance in *Salmonella* strains through whole-genome sequencing, which could identify specific mutations or mobile genetic elements responsible for resistance. Additionally, investigating non-antibiotic infection control methods, such as bacteriophage therapy and improved biosecurity measures, may provide sustainable alternatives.

Collaboration among veterinarians, farmers, scientists, and policymakers is essential to tackle this growing challenge. Policymakers must enforce strict regulations on antibiotic use, while veterinarians and farmers should adopt best practices for antimicrobial stewardship. A multi-pronged approach combining modern diagnostics, regulatory oversight, and innovative treatment strategies will be vital for controlling the spread of resistant Salmonella strains and protecting public health in Kazakhstan.

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Study of the potential for enhancing environmental efficiency in the production of a bioadditive from alfalfa *in vitro* culture

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Abstract

This research aims to explore the induction of alfalfa callus tissues without the use of synthetic growth regulators, thereby aligning with Kazakhstan's broader environmental policies. The specific objectives of this study include: (1) optimizing in vitro culture conditions using natural biostimulants, (2) comparing the effectiveness of various natural alternatives in promoting callus formation, and (3) evaluating the potential applications of the produced biomass in the food and feed industries.

To achieve these objectives, a combination of in vitro culture techniques and analytical methods will be employed. By optimizing culture conditions and utilizing natural biostimulants, this research contributes to the scientific community's understanding of sustainable biotechnological practices while supporting Kazakhstan's goals of fostering ecological sustainability and innovation in agricultural production.

Introduction

The sustainable production of bioadditives has become a priority in modern agricultural and biotechnological practices due to growing environmental concerns and the demand for eco-friendly solutions. In Kazakhstan, where ecological balance is a key national objective, reflected in policies such as the "Green Economy" initiative and the ongoing national "Taza Kazakhstan" campaign, efforts to minimize the use of synthetic chemicals in agriculture are critical . One such area of focus is the cultivation of biomass in vitro for food and feed industries.

Alfalfa (*Medicago sativa*) is one of the world's oldest domesticated crop with a history dating to before 2,000 CE. Alfalfa competes with wheat as the 3rd or 4th most important economic crop for farmers, in spite of the decline in acreage over the past 20 years. Alfalfa is important in many other regions of the world as well. It remains a vital component of modern cropping systems due to its high yield, and its high-quality production for dairy animals and other livestock, and its value in rotations. It is a vital component of cropping systems that benefits many farmers. Although not widely recognized as a food- producing crop, hundreds of millions of people consume a food product originating with alfalfa each day. In this context, it is important to consider that the methods used for its propagation can significantly impact its sustainability and the ecosystem as a whole. However, the traditional methods for inducing callus in plant cultures often rely on synthetic auxins, such as 2,4-D, which pose ecological risks due to their potential toxicity, environmental persistence, and adverse effects on non-target organisms.

The challenge of finding natural alternatives for callus induction is critical in light of these environmental concerns. Natural biostimulants, including humic and fulvic acids, have shown promise in enhancing plant growth and development while minimizing ecological risks. However, the efficacy of these substances in the context of alfalfa callus induction remains underexplored.

Recent advancements in the use of organic compounds, particularly fulvic and humic acids, offer promising alternatives to synthetic plant growth regulators like 2,4-D-hormone. Several

studies have emphasized the role of fulvic acid (FA) in enhancing plant growth by improving nutrient uptake and promoting metabolic processes. For instance, Bindumadhava & Satyanarayana explored FA's biochemical mechanisms and its ability to bolster plant resilience against environmental stressors. Similarly, Capstaff et al. demonstrated that FA induces nodulation-related gene expression in legumes, contributing to improved growth and sustainability [1,2].The findings suggest potential applications for fulvic acid in improving legume cultivation, contributing to sustainable agricultural practices.

Mohamed, S. E. et al. in their study show that humic acid enhances root formation by modulating hormonal balance and promoting antioxidant activity, which is critical for successful rooting [3].

Calvo, P. et al. in an extensive review examines a wide range of plant biostimulants, including humic substances, marine extracts and microbial inoculants, detailing their mechanisms of action. The authors highlight the benefits of biostimulants in improving nutrient uptake, enhancing plant growth and increasing tolerance to environmental stress.They also discuss the implications for sustainable agriculture, providing a framework for integrating biostimulants into crop management practices [4].

Humic acids also show significant potential as eco-friendly growth stimulants. Esringü et al. found that the application of humic and fulvic acids improved growth parameters such as biomass and leaf area in *Impatiens walleriana*, suggesting broad agricultural applications [5]. Furthermore, Muscolo et al. reported that humic substances exhibit auxin-like activity in plant cell cultures, offering a natural alternative to synthetic hormones. Also, the study by Muscolo, A. et al. investigates the molecular characteristics of humic substances obtained from different sources and their effects on the growth and metabolism of *Pinus laricio* callus. The authors highlight the potential of these substances as growth promoters in tissue culture, discussing the mechanisms underlying their effects on plant development. The results contribute to the understanding of the role of humic substances in enhancing tissue culture efficiency and plant regeneration [6,7].

In the context of alfalfa cultivation, Bekkuzhina et al. explored the use of in vitro culture techniques to produce bioadditives from alfalfa tissues, demonstrating the feasibility of scaling these processes to ensure a consistent yield of beneficial phytochemicals. This aligns with broader trends in sustainable agriculture, where biostimulants like fulvic and humic acids are gaining attention as replacements for chemical growth regulators, thus enhancing environmental sustainability [8].

Mohammadi-Nasab, A. et al. studies callus induction and embryogenesis in alfalfa using hypocotyl thin cell layer culture techniques. The authors provide detailed information on optimizing culture conditions to improve regeneration and embryo formation, which is critical for effective alfalfa breeding programs. The study contributes to the understanding of tissue culture methodologies, paving the way for improved genetic progress in alfalfa [9].

The review by Chandran, H. et al. highlights the potential of plant tissue culture techniques such as micropropagation and callus culture for the production of bioactive compounds of industrial significance. The authors discuss recent advances in optimizing culture conditions and using genetic engineering to enhance metabolite yields [10].

Also, Rafińska, K. et al. focus on bioactive compounds derived from Medicago sativa, including flavonoids and saponins, which have various therapeutic properties. The authors discuss the potential applications of these metabolites in agriculture and the pharmaceutical industry, emphasizing their role in promoting sustainable practices. Both studies highlight the importance of studying plant secondary metabolites for the development of natural products that benefit human health and the environment [11].

Thorpe, T. A. traces the evolution of plant tissue culture from its inception in the early 20th century to its modern applications in biotechnology and agriculture. The article outlines major

milestones, including the development of new culture methods and the commercialization of tissue-cultured plants. The author discusses the impact of these advances on crop improvement, genetic conservation, and the pharmaceutical industry, providing historical context for current practices [12].

In the review, Bhat, R., et al. explore the synergistic relationship between organic farming and plant biotechnology, and advocate their integration as a path to sustainable agriculture. The authors analyze how biotechnological innovations such as genetic modification and biopesticides can complement organic methods to improve crop yields while preserving the environment [13].

Thus, issues of environmental sustainability in agriculture are becoming increasingly relevant, especially in Kazakhstan, where priority is given to reducing the use of synthetic chemicals. The introduction of biostimulants such as fulvic and humic acids may offer a natural alternative to traditional methods of stimulating plant growth. In particular, their potential in the cultivation of alfalfa in vitro requires further research to ensure the sustainable production of bioactive additives with minimal environmental impact.

Methods and Materials

The experiment was conducted to investigate the effects of various concentrations of fulvic acid on the callus formation and growth of *Medicago sativa* (alfalfa) in vitro. The choice of fulvic acid was motivated by its known ability to stimulate plant growth and enhance nutrient uptake, particularly in root systems. The «Raihan» variety of alfalfa, which is characterized by high resilience to abiotic stress and favorable nutritional content, was selected as the subject for this study.

The research was carried out in a controlled laboratory environment at the S. Seifullin Kazakh Agro-Technical University, where in vitro conditions were maintained to ensure sterility and precise control over variables like temperature and light exposure.

Plant Material

The seeds of the *Raihan* alfalfa variety were chosen due to their superior adaptation to local climatic conditions and their high yield potential. The seeds were first surface sterilized using a multi-step sterilization process. This involved initial washing in a soap solution, followed by treatment with potassium permanganate and sodium hypochlorite to remove surface contaminants. After each chemical treatment, the seeds were thoroughly rinsed with sterile distilled water to prevent any residual chemicals from affecting subsequent growth.

Sterilization and Preparation of the Growth Medium

The MS medium, which is widely used for plant tissue culture, was prepared by dissolving the required macro- and micronutrients, along with sucrose and agar. The pH of the medium was adjusted to 5.6–5.8 to ensure optimal nutrient availability. Once prepared, the medium was sterilized using an autoclave at 120°C and 1 atm pressure for 20 minutes. Sterilized media were then poured into Petri dishes under sterile conditions in a laminar flow hood, where further manipulations of plant tissues occurred.

The fulvic acid solutions were prepared by dissolving the appropriate concentrations (0.25%, 0.5%, and 1%) in either MS medium or distilled water. Auxin 24-D, known for its ability to induce callus formation, was also used in some variants of the experiment to compare its effects with those of fulvic acid.

Experimental Design

After sterilization, the alfalfa seeds were aseptically transferred onto the prepared media, where each Petri dish contained seeds treated with different concentrations of fulvic acid. To induce callus formation, the explants were slightly wounded with a sterile scalpel, as mechanical damage can promote cell dedifferentiation and the formation of callus tissue.

The experiment included both control and treatment groups:

1. Control group: Seeds cultured on MS medium without fulvic acid.

2. Treatment groups: Seeds cultured on MS medium and distilled water supplemented with varying concentrations of fulvic acid (0.25%, 0.5%, and 1%).

The cultures were incubated in a growth chamber set at +23°C with a 16-hour photoperiod. This controlled light and temperature environment was essential to replicate the optimal conditions for plant growth and callus induction. Seed germination and callus formation were observed and recorded at regular intervals (days 3, 5, 7, and 10) to track developmental progress.

Data Collection and Analysis

The primary outcomes measured were the rate of seed germination, the extent of callus formation, and the overall health of the emerging seedlings. Specific metrics included the percentage of seeds that successfully germinated, the size and quality of the callus tissue, and the visual characteristics of the seedlings, such as leaf color, structure, and root development. All observations were recorded with photographic documentation to provide visual evidence of growth differences between the control and treated groups.

Results

The results of the experiment revealed significant differences in the response of alfalfa seeds to the various concentrations of fulvic acid. In general, the seeds exposed to fulvic acid demonstrated enhanced germination rates and improved overall growth compared to the control group.

Germination and Growth

By day 3, seeds in the fulvic acid treatment groups showed earlier germination, with the emergence of root primordia in several variants. Notably, the seeds treated with 0.25% fulvic acid in distilled water exhibited the most rapid and vigorous growth, with 85% germination by day 10. This was significantly higher than the control group, which showed a 75% germination rate.

In contrast, the highest concentration of fulvic acid (1%) appeared to inhibit growth, as evidenced by the reduced germination rate (40%) and stunted seedling development. These findings suggest a dose-dependent effect of fulvic acid, where lower concentrations stimulate growth, while higher concentrations may have a negative impact on plant development.

Callus Formation

Callus formation was observed in most treatment groups by day 5. The callus tissues were particularly prominent in the 0.25% fulvic acid treatment, where the cells displayed a healthy, friable appearance. The callus was pale green in color, indicating active cell division and differentiation. Conversely, callus tissues formed in the 1% fulvic acid group were smaller, less developed, and appeared more compact, suggesting a suppressive effect at higher concentrations.

Auxin 24-D, used as a comparative treatment, also induced callus formation effectively, but the resulting tissues were denser and more compact than those treated with fulvic acid. This suggests that fulvic acid may promote a more natural and less aggressive callus development process compared to synthetic auxins.

Seedling Development

By day 10, seedlings treated with 0.25% fulvic acid exhibited superior morphological traits. These seedlings had dark green leaves and well-developed root systems, characteristic of healthy and robust plant growth. The control group also showed healthy growth, but the seedlings were slightly smaller and less vibrant in color. In contrast, seedlings from the 1% fulvic acid treatment had pale green leaves, indicating possible nutrient stress or toxicity at this higher concentration.

Discussion

The findings from this study highlight the potential of fulvic acid as a natural growth promoter for *Medicago sativa* under in vitro conditions. The optimal concentration for promoting callus formation and seedling growth was determined to be 0.25%. At this concentration, fulvic acid enhanced both the germination rate and the quality of plant growth, suggesting that it can serve as an effective alternative to synthetic auxins in tissue culture applications.

One possible explanation for the enhanced growth at lower concentrations of fulvic acid is its ability to improve nutrient uptake and promote cell division. Fulvic acid's small molecular size allows it to chelate essential minerals and transport them more efficiently into plant cells. This may explain the increased vigor and health observed in the seedlings treated with 0.25% fulvic acid.

However, the inhibitory effects observed at 1% concentration suggest that there may be a threshold beyond which fulvic acid becomes toxic or disrupts normal cellular processes. This aligns with previous studies that have reported similar dose-dependent responses in other plant species. Further research is needed to fully understand the mechanisms underlying these effects, as well as to determine the optimal application rates for different plant varieties and growth conditions.

Moreover, the comparative results with 24-D auxin highlight the advantages of fulvic acid in promoting less dense, more friable callus tissues, which are often easier to work with in plant tissue culture. This suggests that fulvic acid could be a valuable tool for improving the efficiency of in vitro propagation protocols, particularly for economically important crops like alfalfa.

Overall, this study demonstrates that fulvic acid, when used at appropriate concentrations, can significantly enhance both callus induction and seedling development in alfalfa. Its potential as a biostimulant in agricultural and biotechnological applications warrants further investigation, particularly in terms of its long-term effects on plant growth and productivity under field conditions.

Conclusion

The results of this study highlight the significant potential of fulvic acid as a natural biostimulator for improving the cultivation of alfalfa (Medicago sativa) in vitro. By demonstrating that a concentration of 0.25% fulvic acid can significantly improve germination, callus formation, and the overall condition of seedlings, this study identifies a viable alternative to traditional synthetic auxins such as 2,4-D, which pose an environmental hazard.

This study not only complements the growing body of evidence supporting the use of organic compounds in sustainable agriculture, but is also consistent with Kazakhstan's national goals to achieve ecological balance and reduce the use of chemicals in agriculture. The positive effect of fulvic acid on plant growth can contribute to the development of effective reproduction methods, thereby enhancing the role of alfalfa as a key crop at both local and global levels.

Moreover, the results highlight the importance of optimizing concentrations to ensure maximum plant health, since excess fulvic acid can lead to adverse effects on growth. This dose-dependent effect requires further study of the mechanisms by which fulvic acid affects plant physiology and its long-term effects on agricultural productivity.

Future research should aim to expand these results by exploring the use of fulvic acid in the field and its potential interaction with other biostimulants or growth enhancers.

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Agricultural Sciences

The influence of agro-ecological factors on the growth and yield of hazelnuts in the foothills of Lechkhumi region in Georgia

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Abstract
In the paper, it is presented, taking into account the agro-climatic indicator of the mountain front zone, we chose such a culture that would correspond to the agroecological conditions there, would be high-yielding and profitable. As such culture, we selected "Kharistvala" nut variety introduced for production in Georgia (in particular in Samegralo). At the foot of Lechkhumi mountain at 1000-1100m above sea level. The researches were conducted for the first time at Zemo Lukhvano (Lechkhumi) test base of the agricultural cooperative "Sozalia" on different exposed soils. Growth and development proceeded normally, despite the fact that the climate is harsher in front of Lechkhumi mountain than in Samegrelo (50-60 meters above sea level), we did not use fertilizers and herbicides, we received ecologically clean raw materials. Studies have shown that under favorable conditions of growth and development, hazelnuts in the mentioned region provide quite abundant quality products.
Key words: Lukhvano, Lechkhumi, Kharistvala, foothills, Tkhili. Sozalia

The aim of the study was to select the appropriate culture, which would be high-yielding and profitable, taking into account the agro-climatic indicator of the mountain front zone. As such culture, we selected "Kharistvala" nut variety introduced for production in Georgia (in particular in Samegralo). Hazelnut is a genus of deciduous shrubs, rarely trees of the Birch family. The bush consists of 4-6 mother branches, the leaves are oval in shape, with a double toothed edge. It blooms in winter. The stamen flowers are sessile and are collected in clusters, the pistil flowers are hidden in the bud and only the dings are separated outside. Around each flower, three mutually grown co-flowers develop, which grow larger when the fruit ripens and form a fruit cover of different shapes. The fruit is a one-seeded nut. It ripens from the second half of July to September. Depending on the variety, the yield from one bush varies from 7 to 10 kg during the full flowering period. It is propagated by seeds, division of the bush, rooting, rooting of cuttings and grafting. The genetic resource of hazelnut lifespan is 180–200 years, and each mother branch lives for 70–80 years. It is heat-, light-, and moisture-loving, frost- and drought-resistant, shade-tolerant plant; Thrives on almost all types of soil, giving especially high yields on soils rich in organic matter and humus.

When choosing a place to grow a hazelnut garden, we took into account: biological features of hazelnut culture and attitude to environmental conditions: altitude above sea level; annual amount of precipitation; amount of precipitation in the vegetation period; average relative air humidity; the sum of active temperatures during the vegetative, flowering and fruit ripening periods; Direction, frequency and strength of prevailing winds in a given area.

Since the object of our study is the extreme northern subtropical zone, the foothills (Lechkhumi) are Upper Lukhvano, with agroclimatic differences, located in the valley of the Namkashur River (the right tributary of Tskhenisskali) on the western slope of Tsageri Kvabuli at 1000-1100 meters above sea level, between 420 381 420 421. The chemical and physical properties of the soil were The soil belongs to the type of thick forest soil, the depth of the soil profile is 20-30 cm. The humus layer is 10-15 cm; Forest komral is medium clay with small thickness and mechanical composition. The soil is located on slopes with a slope of 15-300 m. It is heavily eroded. The soil is provided with soluble phosphorus. It is less provided with mobile potassium, it is not irrigated. South lower area (newly exploited) PH-7 is neutral, NN2 is adequate, PP2 is normal, KK2 is normal. The upper part of the south (newly exploited) is PH-7 neutral N2-adequate, PP1-deficient, KK3-deficient. Based on the chemical and mechanical description, the soil belongs to the group of soils with poor quality indicators.studied.

Nut "Kharistvala" is a very profitable variety, the demand for its fruit in the market is high, and the price is accordingly high. A two-year-old seedling with 600 root shoots was selected and planted in 2015-16 at different exposures to the east - on sloping alluvial fertile soil and on flat, less fertile soils.

The scientific novelty of the research is that in the conditions of the foothills of Lechkhumi, we have cultivated and studied for the first time a selected variety of hazelnut, at the research site. Plants were systematically photographed and phenological and biometric indicators were determined for each plant. We did not use mineral and organic fertilizers, we also did not use herbicides.

As for care, the first cultivation in the spring was carried out by loosening the inter-rows, and after the second cultivation, the upper part of the land developed strongly, the leaves completely covered the soil, shaded it and weeds were not allowed to develop, therefore further care was no longer necessary.

We studied the phenological, agro-ecological and agro-technological features of hazelnuts, which we studied, the formation of buds, the beginning and end of vegetation, massive flowering, emergence, and the average weight of the harvest obtained from one plant.

Growth strength of the bush: medium growth. Bush shape: spherical shape. Flowering period: December - February. Fruit: oval. The number of fruits in a pod is 3-4 pieces, the fruit falls easily from the pod, the thickness of the shell is 1.1-1.2 mm. Fruit size: 19X18X16 mm in size. Fruit weight: average weight 2.2-2.3 grams. Cardiac output: 42-43%. Fat content: 66-67%. Yield: high. Average yield is 5-7 kg/tree/bush. Resistance to diseases: resistant to pests and diseases. Harvesting period: from the end of August to the 20th of September. The name of the variety: Kharistvala (chosen as a synonym: Khoji nut).

The scientific novelty of the research is that in the conditions of the foothills of Lechkhumi, we have cultivated and studied for the first time a selected variety of cultivated hazelnuts at the research site.

Observations have shown that nuts are more profitable than many agricultural crops. It is resistant to diseases. Does not require chemical treatment. It is frost-resistant, unpretentious to the soil. Accordingly, we recommended that as a profitable crop for local farmers or peasants, it is possible to grow cultivated nuts in the agrarian area of the foothills zone.

Nut seedlings before planting

Pits prepared for planting nuts

Nut plantation

Nut male flowers

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Sociological Sciences

ДИНАМИКА ДЕМОГРАФИЧЕСКИХ ПРОЦЕССОВ В МОЛОДЁЖНОЙ СРЕДЕ КАЗАХСТАНА

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Аннотация

В настоящем исследовании научно обоснованы причинно-следственные связи демографических процессов, происходящих в молодёжной среде Казахстана. Детально изучены сложившиеся тенденции в изменении численности молодёжи и её уровень рождаемости как в целом по республике, так и по типу местности: село-город. Выявлено влияние демографической ямы, образовавшейся в 1991-2003 годы на численность молодёжи, что подчёркивает важность показателя рождаемости.

На основе выявленных причинно-следственных связей сложившегося тренда ічисленности молодёжи за период 2013-2024 годы, а также ситуации постепенного выхода из влияния демографической ямы, был сделан прогноз численности молодёжи на 2025-2027 годы. Определена ключевая роль многодетности в целях устойчивого развития воспроизводственных демографических процессов страны.

Данное исследование финансировалось Комитетом науки Министерства науки и высшего образования Республики Казахстан (ГФ AP23488200 - Научно-методологические основы междисциплинарных исследований социально-экономических процессов современного Казахстана: статистико-математические методы, компьютерные технологии).

Ключевые слова: демография, рождаемость, демографическая яма, молодёжь.

Демографическое воспроизводство населения, в частности, численность молодёжи, на сегодняшний день является одним из показателей безопасности страны. Казахстан, в целом, находится на стадии демографического перехода от расширенного к суженному воспроизводству, поэтому проблема демографии молодёжи требует глубокого изучения, охватывающий длительный период.

Согласно официальным данным Бюро национальной статистики Агентства по стратегическому планированию и реформам Республики Казахстан за годы независимости Казахстана по основным демографическим показателям молодёжи в возрасте от 14 до 35 лет произошли значительные изменения, сформировались определенные тренды (рисунок 1).

В результате экономических изменений в стране, нарушения хозяйственных связей, а также трудностей первых лет независимости, рождаемость начиная с 1991 до 2003 года стала резко снижаться, затем медленно повышаться до 2014 года, далее стала сохранять стабильный темп изменения рождаемости.

В связи с этим, анализируя демографические процессы с 1991 года, очень важно было дать научное обоснование причинно-следственных связей этих процессов, оценку

закономерностей и реальную интенсивность демографических показателей молодёжи страны на перспективу. Такая ситуация с рождаемостью стала следствием волнообразной тенденции изменения численности молодёжи.

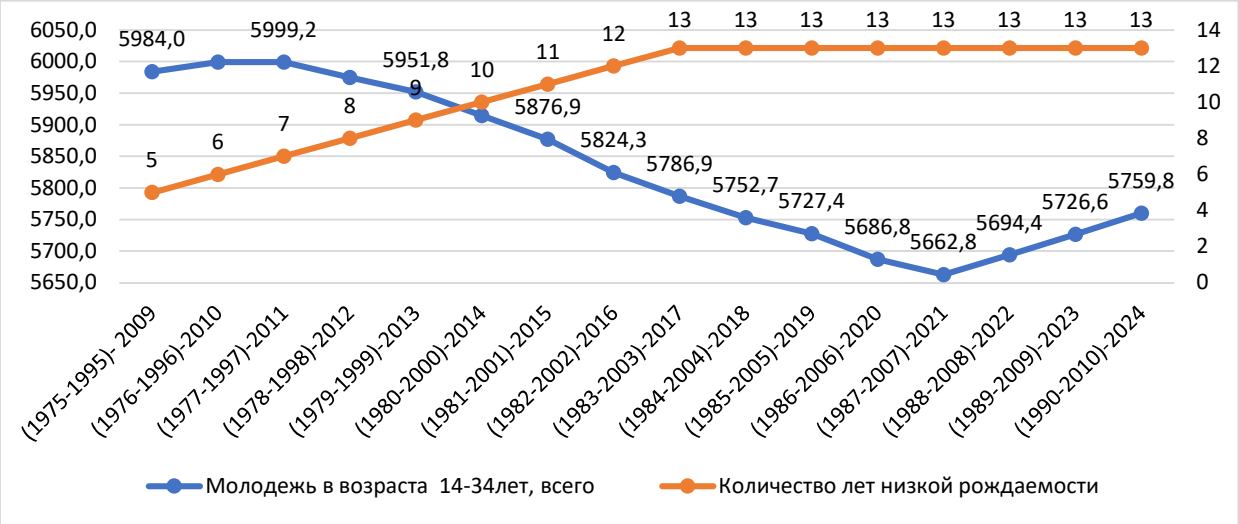

Рисунок 1 - Динамика численности молодёжи и количество лет низкой рождаемости за 2009-2024 годы

На рисунке 1 приведена динамика численности молодёжи. Так, если в 1999 году численность молодёжи составляла 5197,5 тыс. ед., то в 2009 г. численность выросла до 5984,0 тыс. ед. Молодёжь 2009 года формируют дети родившиеся в 1975-1995 годы, то есть сдерживающим поколением всей численности молодёжи относятся к родившимся в 1991-1995г.г. (5 лет). На графике можно увидеть снижение численности молодёжи до 2022 года.

Количество демографических кризисных лет растёт до 13 лет, затем с 2025 года ожидается снижение до 2037 года. Таким образом, численность молодёжи до 2037 года будет медленно расти в соответствии со снижением кризисной нагрузки.

В результате расчёта корреляционной зависимости численности молодёжи и количества лет демографической ямы была установлена отрицательная связь, так как коэффициент корреляции R=-0,94. Причинно-следственные связи сложившегося тренда численности молодёжи за период 2013-2024 годы (Рисунок 2), а также ситуация постепенного выхода из влияния демографической ямы 1991-2003 годов, позволили сделать прогноз на перспективу по уравнению тренда

$$У=4,2241t^2-76.638t+6049.7,$$

а коэффициент детерминации R^2=0.96 подтверждает адекватность модели. Таким образом, численность молодёжи в 2025 году вероятно составит в среднем 5767,3 тыс. человек; в 2026 году – 5804,7 тыс. человек, а в 2027 году – 5850,6 тыс. человек. В целом, за 2022-2024 гг. темп роста составил 0,65 и в перспективе в 2025-2027г.г. заданный темп сохранится.

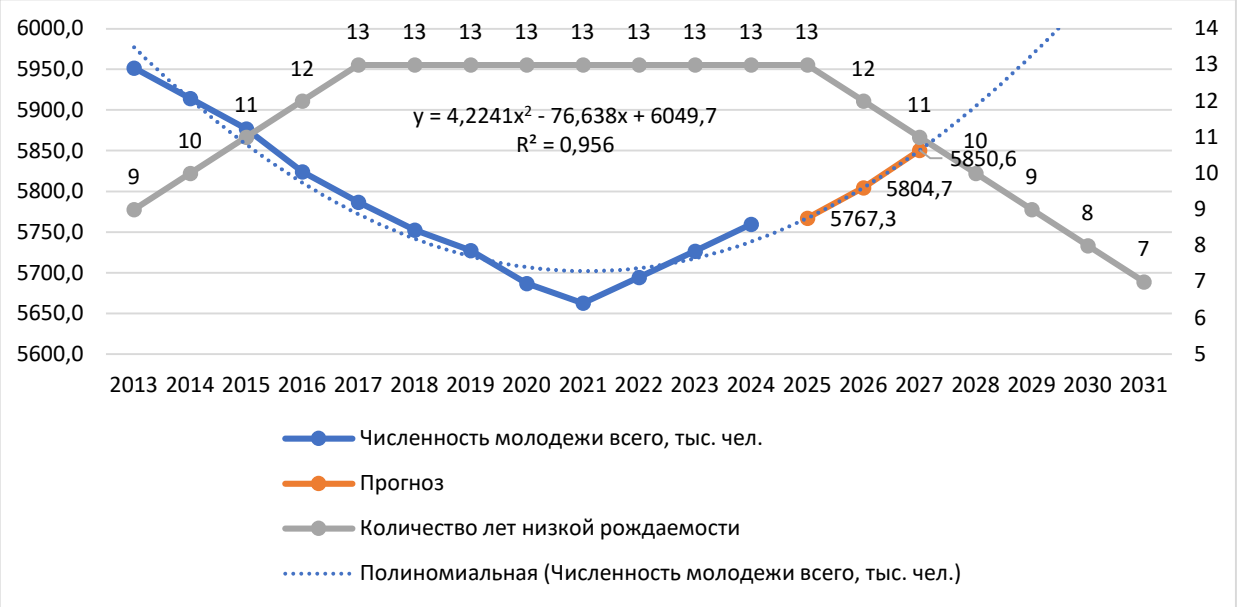

Рисунок 2 - Прогноз численности молодёжи на 2025-2027 годы

Сокращение численности молодёжи привело к снижению их доли в структуре общей численности населения. Так, в 2009 г. доля молодёжи составила 37,4%, а в 2024 г. снизилась до 28,8%. Разница в численности молодёжи также наблюдается по типам населённых пунктов. Рост численности городской молодёжи в 2009 г. составил 3259,1 тыс. человек, а в 2024 г. - 3591,6 тыс. человек. Соответственно, снизилась численность молодёжи на селе от 2662,8 тыс. человек до 2168,2 тыс. человек.

Доля молодёжи в городе в 2009 г. составила 37,6%, а в 2024 г. 28,8%, соответственно на селе 36,4% и 28,6%. Если в 2009 г. численность молодёжи в городе была больше на 22,4% численности молодёжи в селе, то в 2024 г. - на 65,6%. Такая тенденция сохранится в перспективе, пока не будут решены проблемы села.

Численность сельской молодёжи в возрасте от 14-ти до 19-ти лет до 2014 года была больше, чем городской. Молодёжь из села в возрасте от 19-ти до 23-х лет в поисках работы и получения специальности приезжала в город, затем часть из них возвращалась обратно, и разница составляла 37,9 тыс. человек. В последнее десятилетие наблюдается тенденция, когда молодёжь, приезжающая на учёбу в город, не возвращается в село. Так, по данным Научно-исследовательского центра «Молодёжь» за 2024г. разница между численностью городской и сельской молодёжью в возрасте старше 19-ти лет умеренно возросла и составила 101,3 тыс. человек.

Анализ динамики численности молодёжи женского пола за 2009-2024 годы показал, что доля молодых женщин в стране снижается, если в 2019 году показатель составил 50,2%, в 2023 году – 49,1%, то в 2024 году - 49%. Доля молодых женщин, проживающих в городе выше, чем на селе. Если в 2009 г. доля городских женщин была равна 52,3%, а сельских - 48,6%, то в 2024 г. их доля составила - 50,3% в городе и 46,9% на селе.

В целом численность молодёжи за период с 2009 по 2024 годы снизилась, в частности численность женщин снизилась с 3001 тыс. человек в 2009 году до 2810,6 тыс. человек в 2023 году, в 2024 г. произошёл небольшой рост в сравнении с предыдущим годом и численность молодых женщин составила 2822,6 тыс. человек.

Анализ демографических данных Казахстана за период независимости свидетельствует о существенном влиянии флуктуаций рождаемости на возрастную структуру населения, особенно на численность молодёжи. Демографическая яма 1991-2003 годов повлияла на численность молодёжи (численность формируется от рождаемости предыдущих лет и количества женщин детородного возраста). Такая устойчивая причинно-

следственная связь демографических процессов подчёркивает важность показателя рождаемости.

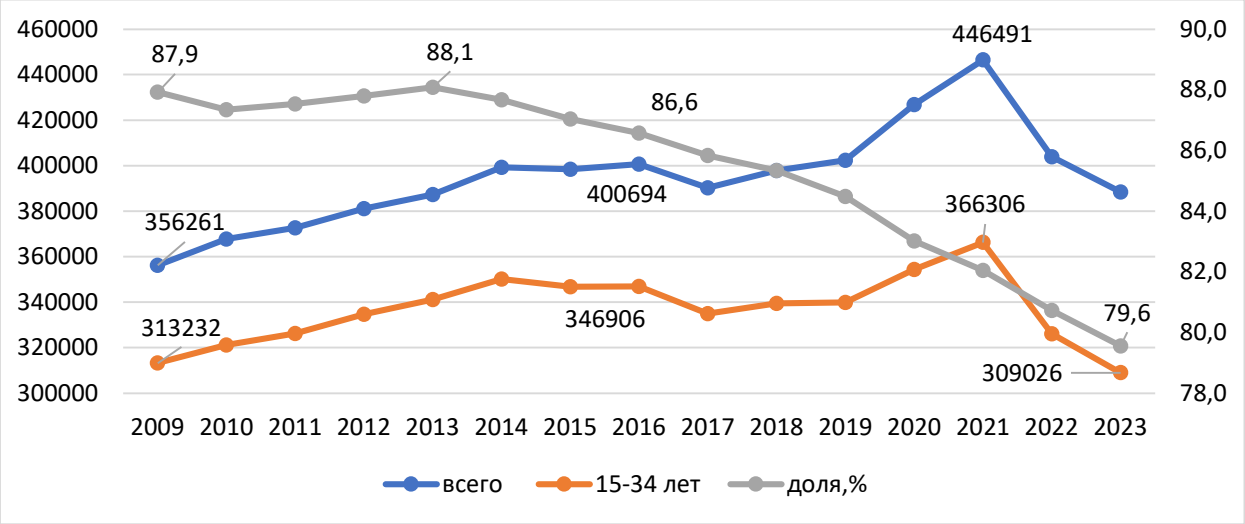

Рисунок 3 - Динамика рождаемости у матерей в возрасте 15-34 лет и их доля от общего числа рождаемости, 2009-2023 годы

В период с 2009 по 2023 годы абсолютные значения рождаемости также изменялись волнообразно, в 2009-2016 годы возросли, затем произошло снижение, начиная с 2018 года снова рост и в 2021 году достигнуто максимальное значение – 446 491.

На рисунке 3 видно, что общая рождаемость по стране и рождаемость у матерей в возрасте 15-34 лет коррелированы. Более 80% родившихся в стране детей приходится на долю матерей в возрасте 15-34 лет. Доля рождаемости среди молодёжи от общей рождаемости за этот период имеет тенденцию снижения. Так, в 2009 году она составила 87,9%, а с 2013 года стала резко снижаться и в 2023 году была равна 79,6%, что связано со снижением численности женщин в возрасте до 34 лет.

Анализ доли рождаемости у молодых матерей по типу местности проживания позволил выявить, что доля рождаемости среди молодёжи на селе выше, чем в городе. Если рождаемость в городской и сельской местностях в 2009 году была близка к 88,0%, то в 2013 году на селе был достигнут максимальный уровень 88,7%, тогда как в городе уровень рождаемости составил 87,5%. После 2013 года доля рождаемости среди молодёжи стала резко снижаться. В 2023 году в городе этот показатель составил – 78,7%, на селе – 80,8%. Если в абсолютном измерении в 2023 году в городе родились 181,3 тыс. детей, а на селе 127,7 тыс. детей. Однако стоит отметить, что на селе плодовитость больше, поскольку в сельской местности проживает меньше молодёжи, а коэффициент рождаемости на тысячу женщин больше.

При этом средний возраст матерей в 2023 году составлял 29,2 лет в селе и 30,1 лет в городе, а возраст матерей при рождении первого ребёнка в селе - 24,1 лет, в городе 25,9 лет.

Коэффициент рождаемости женщин в селе значительно выше, чем в городе на протяжении последних 5 лет, но с каждым годом разрыв рождаемости между селом и городом увеличивается. Если в 2019 году разрыв коэффициента рождаемости женщин между селом и городом составлял 10,98, то в 2023 году – уже 28,75.

Как было изложено ранее, демографическая ситуация в Казахстане находится под влиянием демографической ямы рождаемости 1991-2003 годов, в этой связи, многодетность играет важную роль для устойчивого развития воспроизводственных демографических процессов.

Из рисунка 4 наблюдаем, что рождение по очерёдности рождения первых (кроме 2021г.), третьих (кроме 2022г.) и вторых (кроме 2022 и 2023г.) снижаются из-за уменьшения количества женщин в возрасте до 29 лет. В перспективе до 2030 года, из-за снижения численности женщин в возрасте 25-29 лет произойдёт снижение рождаемости третьих детей по очерёдности.

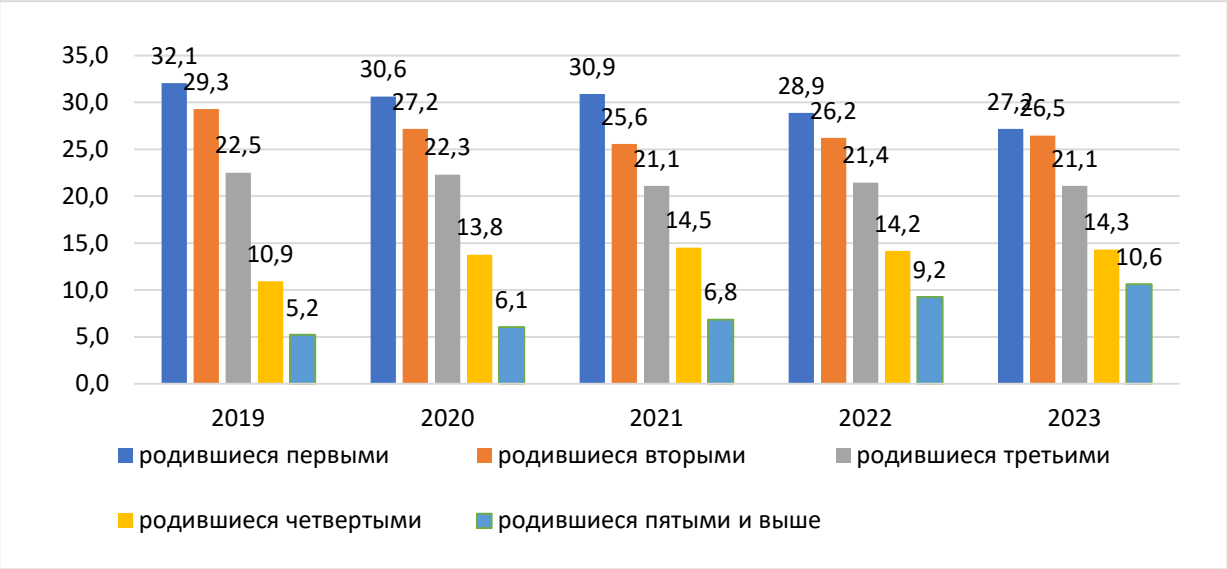

Рисунок 4 – Доля детей по очерёдности рождения, 2019-2023 годы

В 2019-2023 годы рождение четвертых, пятых и более по очерёдности детей возросло, но после 2030 года из-за влияния демографической ямы и перехода женщин к более старшему возрасту, детерминантом обеспечения объёма рождаемости станут молодые женщины до 34 лет.

На наш взгляд, важным является исследование рождений четвертых, пятых и более детей по очерёдности и по типам местности. Так, согласно рисунку 1.12, в 2023 году в городе доля рождаемости четвёртого ребёнка по очерёдности составляла 12,9%, а на селе соответственно 16,3%, доля пятого ребёнка в городе - 8,6%, на селе - 12,9%. Так, для роста рождаемости необходимым является поддержка многодетности среди молодёжи, которая способствует развитию демографии в стране.

Таким образом, проведённое исследование позволяет сделать следующие **выводы**.

Меняющаяся ситуация с рождаемостью стала следствием волнообразной тенденции изменения численности молодёжи. В результате расчёта корреляционной зависимости численности молодёжи и количества лет демографической ямы была установлена отрицательная связь, так как коэффициент корреляции R=-0,94. В связи со снижением кризисной нагрузки с 2025 по 2037 годы, численность молодёжи до 2037 года будет медленно расти.

Сокращение численности молодёжи привело к снижению их доли в структуре общей численности населения. Так, в 2009 г. доля молодёжи составляла 37,4%, а в 2024 г. снизилась до 28,8%. Также наблюдается снижение доли молодых женщин в стране, если в 2019 году показатель составлял 50,2%, то в 2024 году - 49%.

В связи с тем, что демографическая ситуация в Казахстане находится под влиянием демографической ямы рождаемости 1991-2003 годов, многодетность играет важную роль для устойчивого развития воспроизводственных демографических процессов. Стоит отметить, что общая рождаемость по стране и рождаемость от матерей в возрасте 15-34 лет коррелированы. Более 80% родившихся в стране детей приходится на долю матерей в

возрасте 15-34 лет. Доля рождаемости среди молодёжи от общей рождаемости имеет тенденцию снижения.

Кроме того, в общем по республике доля матерей из сельской местности, родивших детей в возрасте 15-34 года больше, чем доля матерей аналогичной возрастной группы, но из города. Коэффициент рождаемости на селе также больше, чем в городе, при этом разрыв рождаемости между селом и городом увеличивается с каждым годом.

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Legal Sciences

Проблемы регулирования займов между физическими лицами в Казахстане

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В данной статье рассматриваются актуальные проблемы гражданского законодательства в сфере займов между физическими лицами. Проводится анализ действующего законодательства в вопросах регулирования сделок между физическим лицом- кредитором, и физическим лицом - заемщиком. В целях ознакомления с подходом зарубежных государств, проведено изучение законодательства Соединенных Штатов Америки. Также в статье предложены, пути развития гражданского законодательства в вопросах займов физических лиц.

Актуальность исследования проблем регулирования займов между физическими лицами с теоретической точки зрения заключается в необходимости развития гражданского законодательства в сторону помощи физическим лицам. Это обусловлено в первую очередь необходимостью защиты среднестатистических субъектов права не имеющих специальных знаний в сфере юриспруденции. Такие лица зачастую принимают решения, опираясь на свое общее представление о структуре законодательства. То есть рассматриваемые лица, зачастую не сверяют заключаемые договора с нормами законодательства или делают это, изучив только отдельные положения. Одним из ярких примеров выступает договор займа между физическими лицами, где нет отдельной нормы регулирующей займы между физическими лицами. С практической точки зрения возникает вопрос о целесообразности такого подхода, это обуславливается тем фактом, что при выдаче займа лицо не имеет возможности самостоятельно разобраться в вопросе без затрат большого количества времени.

В этой статье мы рассматриваем проблемы такого подхода в отношении физических лиц, а также законодательство, действующее в сфере займов между физическими лицами.

В соответствии с вышесказанным целью работы является освящение проблем регулирования займов между физическими лицами в Казахстане, а также поиск путей для их решения.

Чтобы освятить данную проблему и предложить возможные решения мы поставили следующие задачи:

1) Рассмотреть действующее законодательство в сфере займов между физическими лицами;
2) Проанализировать судебную практику по делам о займах между физическими лицами;
3) Ознакомиться с подходом зарубежных стран в вопросах регулирования таких займов;
4) Предложить возможные пути решения проблемы.

Для достижения цели и выполнения задач нами были выбраны соответствующие методы. Одними из основных методов исследования были избраны: Сравнительно-правовой метод исследования, правовой анализ, метод конкретно-социологических исследований,

моделирования. Также применен ряд общенаучных методов исследования, как: Диалектический метод исследования, анализ, синтез, социологический метод исследования и другие.

Если говорить о научной разработанности темы, то можно отметить работу к.ю.н., профессора С.И. Климкина [4], смежные вопросы рассматриваются в работах Нам Г. [5], Плотниковой К. В.[6] и других авторов.

Теоретическая значимость заключается в возможности применения изложенного материала для дальнейших исследований в рассматриваемой сфере. Практическая значимость заключается в возможности применения результатов исследования при формировании законодательства.

Если говорить о займах с точки зрения социального явления, то становиться ясно, что физические лица, участвующие в сделке по предоставлению своих материальных благ другому лицу в большинстве случаев делают это, основываясь на своем субъективном представлении о законности такой сделке. Например, гражданин А. получает сообщение от своего коллеги по работе Б., что ему срочно нужны денежные средства в размере 100000 тенге на оплату счетов до поступления заработной платы. При этом гражданин Б утверждает что за это готов дать 10% от суммы займа сверху. В подавляющем большинстве случаев гражданин А. согласится на такое предложение, попросив предоставить расписку, либо заключить договор. Однако в соответствии с законодательством стороны заключающие договор займа, целью которого является получение прибыли с физическим лицом (заемщиком), на основании п. 4 ст. 725-1 Гражданского Кодекса Республики Казахстан [1] (Далее- ГК РК) обязаны указать в договоре годовую эффективную ставку. Из этого вытекает сразу несколько проблем связанных с указанием годовой эффективной ставки, самой очевидной проблемой можно назвать тот факт, что физические лица зачастую не обращаются к законодательству при заключении такого рода сделок. Однако если для решения этой проблемы достаточно ознакомиться с нормами законодательства, то в случае с порядком расчёта годовой эффективной ставки, законодателем указывается сложная формула расчёта эффективной ставки, с который проблемы возникают даже у лиц осуществляющих деятельность в сфере финансов. Соответственно при обращении в суд, такая сделка на основании ст. 158 ГК РК признается оспоримой судом на основании того факта, что содержание сделки не соответствует законодательству РК. В этом случае гражданин А. не только не получает прибыли, но и вынужден тратить свое время на восстановление положения до того, которое у него было до заключения сделки, либо надеется что суд займет его позицию при рассмотрении дела. При этом стоит отметить, что такие сделки заключаются огромным количеством людей, при ознакомлении с поставленным вопросом становится понятно, что такие соглашения заключает большая часть граждан даже не задумываясь о правильном порядке заключения в соответствии со статьей 725-1. Из вышесказанного становится понятно, что такой подход к регулированию вопроса идет в разрез с культурно-социальным восприятием большинства субъектов права.

Для формирования представления о рассматриваемом вопросе необходимо проанализировать действующее законодательство. Начнем с положений Гражданского Кодекса РК имеющих существенное значение в рамках рассматриваемой темы, а именно статей 715, 718, 725-1 ГК РК.

Таким образом п. 1 ст. 715 ГК РК указывает на то, что одна сторона обязуется передать другой стороне деньги или вещи, при этом в положении определяется, что заемщик обязан вернуть равную сумму денег или вещей того же рода или качества. Из такого определения возникает вопрос в части возвращения заемщиком равного количества денег и вещей, без вознаграждения. Однако ответ на вопрос дается уже в статье 718 ГК РК, где определяется вознаграждение по договору займа, то есть все вещи и деньги, установленные сверх размера

займа, устанавливаются договором, как вознаграждение по договору займа. В ст. 725-1 ГК РК выделяются особенности договора займа, заключаемого с заемщиком – физическим лицом. В п.1 выделяются следующие особенности:

1) предмет договора – деньги, либо вещи, определенные родовыми признаками;

2) заемщик – физическое лицо;

3) займ выдается в национальной валюте;

4) договор должен содержать годовую эффективную ставку;

5) Годовая эффективная ставка не должна превышать ста процентов в год;

6) размер неустойки (штрафа, пени) за нарушение обязательства по возврату суммы займа и (или) уплате вознаграждения по договору займа не может превышать 0,5 процента от суммы неисполненного обязательства за каждый день просрочки, но не более десяти процентов от суммы выданного займа в год;

7) сумма всех платежей по договору займа, за исключением самого предмета займа не может превышать сумму выданного займа за весь период действия договора займа;

8) индексация обязательства и платежей по договору займа с привязкой к любому валютному эквиваленту не допускается;

9) условия договора о размерах вознаграждения, неустойки (штрафа, пени), комиссий и иных платежей не могут быть изменены в сторону их увеличения.

В рамках данных особенностей можно выделить вопрос о расчете годовой эффективной ставке. Годовая эффективная ставка на данный момент определяется Постановлением Правления Национального Банка Республики Казахстан «Об утверждении Правил расчета годовой эффективной ставки вознаграждения по договору займа» от 27 августа 2018 года № 197 [2]. В соответствии с указанными правилами формула расчета включает в себя: порядковый номер выплаты и последней выплаты заемщику; сумму выплаты в зависимости от порядкового номера выплаты; период времени со дня предоставления займа до момента определенной выплаты; номер платежа и последнего платежа; сумма платежа и т. д. Из вышеуказанного и сложности самой формулы можно сделать вывод, что провести расчёт без помощи специалиста, либо специальной программы затруднительно. Стоит отметить, что на официальном сайте Национального Банка Республики Казахстан есть калькулятор по расчёту годовой эффективной ставки, однако на момент написания статьи страница недоступна. В соответствии с этим мы считаем, что необходимо разъяснение ГЭСВ с приведением примера расчёта. Еще одной из особенностей выделяется то, что условия договора о размерах вознаграждения, неустойки (штрафа, пени), комиссий и иных платежей не могут быть изменены в сторону их увеличения. Это стоит учитывать, так как даже при обоюдном согласии на изменение условий договора в сторону увеличения платежей, изменение этих условий повлекут последствия, указанные в п. 2 ст. 725-1 ГК РК, а именно договор будет признан ничтожным.

Необходимо также рассмотреть положения налогового законодательства в сфере займов физических лиц. Одним из важнейших вопросов является, когда физическое лицо – кредитор, может получать прибыль с договора займа без регистрации в качестве индивидуального предпринимателя. В соответствии с п.п. 2, п. 2, ст. 35 Предпринимательского кодекса Республики Казахстан обязательной регистрации подлежат физические лица которые имеют от частного предпринимательства годовой доход, исчисленный в соответствии с налоговым законодательством Республики Казахстан, в размере, превышающем 12-кратный минимальный размер заработной платы, установленный законом о республиканском бюджете и действующий на 1 января соответствующего финансового года.

Рассмотрим подход других стран по регулированию займов между физическими лицами. Если говорить про опыт Соединенных Штатов Америки (Далее – США), то там федеральные

законы хотя и дают большую свободу, но всё-таки имеют определенные требования. В США существуют законы, которые требуют от кредитора применять минимальную процентную ставку, которая переводится как: «Применимая федеральная ставка» (Далее- AFR). Эта ставка публикуется Налоговой Службой (IRS) каждый месяц на основании раздела 1274(d) «Internal Revenue Code»[3]. Таким образом, даже в случае составления договора займа между членами семьи существует необходимость включения AFR. Например, вы выдали кредит члену семьи на сумму 20 000 долларов США, который должен быть погашен через год. Вам нужно будет получить от заемщика минимальную процентную ставку, например 5% таким образом вы должны получить от члена семьи 1000 долларов США. В случае несоблюдения условий кредитором, налоговая инспекция учтёт упущенные проценты как подарок и потребует выплаты налога. Рассмотренный подход имеет преимущество в том, что даже при отсутствии AFR в договоре займа, такой договор всё еще считается действительным. При этом безвозмездное предоставление средств всё еще облагается налогом, что на наш взгляд является неэффективным подходом, так как отслеживать такие займы до обращения в суд является невозможным.

Проанализировав подход зарубежного государства, нами предлагается следующий подход: Если стороны в договоре займа не указывают годовую эффективную ставку, то такой договор будет признан договором займа заключенным на безвозмездной основе. При этом стоит исключить необходимость указания годовой эффективной ставки для безвозмездного займа между физическими лицами. Такой подход направлен на упрощение процесса заключения договора безвозмездного займа, а также обращение внимания кредитора на последствия не включения процентной ставки.

Для реализации идей мы рассматриваем возможность добавления новой статьи в ГК РК под номером 725-2. Примерное содержание статьи представляется нам следующим образом: Статья 725-2 Особенности договора займа между физическими лицами. Пункт первый Договор займа, если обе стороны являются – физическим лицом, имеет следующие особенности: сохраняет п.п. ст. 725-1, за исключением п.п. 4-5 (об обязательном содержании годовой эффективной процентной ставки и ее пределах). При этом в п.п. 2 вносится изменение с указание на то, что кредитором является физическое лицо, не являющееся индивидуальным предпринимателем. Второй и четвертый пункты статьи 725-1 переносятся, как 2 и 3 соответственно. Пункт четвертый: Договор займа заключенный в соответствии с п. 1 настоящей статьи, без указания суммы вознаграждения признается беспроцентным. Пункт пятый: Сумма вознаграждения по договору займа между физическими лицами не должна превышать сумму, установленную нормативным правовым актом уполномоченного органа по регулированию, контролю и надзору финансового рынка и финансовых организаций.

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Literature

AZƏRBAYCANIN TÜRK MƏDƏNİYYƏTİNDƏ INSAN RUHUNUN MƏNƏVİ EKOLOGİYASI

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ABSTRACT

In order to better understand the elements influencing how humans interact with their environment, human ecology analyses human existence and activity in many ecosystems and civilisations, both historically and currently. First and foremost, the ecology of the human soul is a society with a high level of culture and spirituality and the recovery of a mentally ill individual. Human adaptation to the natural environment can only occur through the moral purification and spiritual resuscitation of global interests and ideals. Ultimately, it turns out that the destruction of environment is not the biggest harm; rather, the fall in spirituality causes the most harm to the individual. Many individuals think that spiritual gifts-capabilities that allow us to communicate with the holy and invisible-exist. Here are six indicators that you might have a spiritual gift, regardless of how long you've felt that you're in tune with higher powers or how recently you've begun to explore your spiritual side: intuition, empathy, vivid visions, dreams, energy sensitivity, paranormal experiences, and to assist others.

Keywords: Human spirit, Culture, Morality, Spirituality, Philosophy, Ethics, Purification.

1. GIRIŞ

Biz canlı Yer planetində Həyat Şəbəkəsinin bir hissəsi kimi təkamülümüzdə son dərəcə xüsusi bir məqamda yaşayırıq. İnkişaf-böyümə paradiqması təkcə dağlarımızı, çaylarımızı və meşələrimizi viran qoymayıb və təbii ekosistemlərə nəzərəçarpacaq ziyan vurmağa davam edir - o, həm də kollektiv şüuraltını koloniyalaşdırır və Ruh ekosistemlərimizi məhv edir. Məhz buna görə də böyümə təklifləri və təşəbbüsləri gizli poliböhranların olduğu dünyaya sabitliyi qaytarmaq üçün lazım olan sürətlə inkişaf etmir.

İnsan ruhu əsrlər boyu filosoflar, ilahiyyatçılar və rəssamlar tərəfindən araşdırılan mürəkkəb və çoxşaxəli bir anlayışdır. Ruhun ekosistemləri həmişə Yer kürəsində yaşayan Yetkin Mədəniyyətlərdə mövcud olmuşdur. Ruhun heç bir qəti tərifi yoxdur, lakin o, çox vaxt bədənin ölümündən sonra sağ qalan insanın qeyri-maddi mahiyyəti kimi başa düşülür.

İnsan, bədən və ruhun birləşməsidir və ruh bədənin cövhəridir. Bildiyimiz qədər, günah işlədən hər hansı bir insan özünü pak etmək üçün Allaha tövbə duası edir. Çünki Allah bizi pak etməyə qadirdir və beləliklə, ruhumuz Allah tərəfindən təmizlənir.

Təmiz ruh, niyyəti dürüst olan kimsədir, hər şeyi ləyaqət və ya status üçün deyil, onları yerinə yetirməyin sevinci üçün edən biridir. Diqqəti cəlb etmək və ya şöhrət qazanmaq əvəzinə, ruhun yaxşı/doğru olduğuna inandığı üçün qərarların öz daxili dünyasından gəldiyi üçün edən ruhdur. Təmiz ruh hər bir həyatı mühakiməyə açıqdır. Sokratın fikrincə, insan ruhu görünməz və ölməzdir,

bədəni idarə edir. [1] Fikirlərinin ilham mənbəyinin öz Daimonu *(vcdan, daxili səs*) olduğunu bildirən Sokratın fikrincə, kainat təsadüfi deyil, rasional nizama görə qurulmuşdur.

İnsan doğulduğu andan fani varlıq kimi bədəndə yaşayır. Doğum bədənin başlanğıcıdır, ölüm isə sonudur. İnsan ölümün əhatəsində yaşayır, çünki bədənlə eyniləşir. Cəmiyyəti yalnız insanın vücudu maraqlandırır, vücud istifadə edilir. Ruhu olan insan azaddır, ona görə də "təhlükəlidir", çünki onu köləyə çevirmək olmaz. İçində ölməz bir ruh olan insan Tanrının özünə daha dərindən bağlı olur. Cəmiyyətin, sivilizasiyanın, mədəniyyətin süni quruluşlarına çox da əhəmiyyət vermir; bunlar onun üçün sanki həbsxana kameralarıdır.

Qədim bir ruhun ümumi xüsusiyyəti müdriklikdir. Kainata dərin maraq, yüksək empatiklik və güclü intuitivlikdir. Güclü müdriklik, empatiya və niyyət bütün həyatda yaşlı ruhların yaşadığı çətinlikləri izah edən şeylərə səbəb olur və onların çətin anlar yaşamasının səbəblərindən biri sosiallaşmanın asan başa gəlməməsidir. Dünyagörmüş bir ruh olaraq həyatın, təcrübələrin və fəlsəfənin arxasında daha dərin qatları görür. Ətrafındakı dünyanı poetik və bəzən qeyri-adi bir şəkildə müşahidə edir, bunlarla ünsiyyət qurmaq həmişə asan olmur, beləliklə, təklənmə və hətta sosial təcridə gətirib çıxara bilər.

Həqiqətə yaxınlaşdıqca azmaq ehtimalı da bir o qədər çox olar, çünki həqiqətə yaxınlaşdıqda insan eqoist ola bilər: "Mən bilirəm" düşüncəsi insanı qaranlıq vadiyə sürükləyər və o, zirvəni itirər. Həqiqətə yaxınlaşanda onu insanlarla bölüşmək üçün böyük bir istək yaranır. Lakin insan bütövlüyə öz daxilində hələ nail olmayıbsa yarı həqiqətləri bölüşmək təhlükəlidir, çünki yarı həqiqətlər yalandan daha təhlükəlidir. Yalanlar gücsüzdür, çünki yalan ayaq açsa da uzaq gedə bilmir. Yarı həqiqətlər isə güclüdür və əsrlər boyu davam edə, təsir göstərə bilər. Heç kim yarımçıq həqiqətə çata bilməz və yolun yarısını gedən adam nə bu dünyaya, nə də o biri dünyaya aid olacaq. O, çaşqınlıq içində olacaq və bu, çox qəribə bir vəziyyətdir: insan köhnəni itirir, yenisini əldə etmir; xaosa çevrilir. Köhnə nizam gedir, yenisi isə yoxdur. Daha aydın olmaq əvəzinə çaşqın olur. Daha canlı və işıqlı olmaqdansa, həyatı iki qütb arasında münaqişəyə çevrilir. İnsanın yarısı yerə və yarısı göyə məxsus olur. Beləliklə, o heç yerdə deyil və heç kimdir. Bu qəzəbli və dəli ruh yarada bilər.

Müasir nəsil, əsasən, maddi dəyərlərə yüksək qiymət verir, lakin maddi yoxsulluğu dəf etmək mümkün olsa da, ruhun yoxsulluğu faciədir. *"Əxlaqi tərbiyə, xəstəliklərimizi sağaldan, hər şeyi ehtiva edən və həm özümüzü, həm də ətrafdakı mənfi qüvvələrdən qoruyan bir prosesdir"[2, s. 7].* Əxlaq tərbiyəsi gənclərdə ədalət, insan rifahı, müxtəlif situasiyalarda əxlaqi və qeyri-əxlaqi amilləri nəzərə almaq bacarığını inkişaf etdirir.

Bütün hadisələr həmişə indiki zamanda, yalnız İNDİ tərəfindən mövcud olan məkanda baş verir və bu, hadisələrin baş verməsinin yeganə yolu, mövcud olan vaxtdır. Toxum indi məhv olur, qönçə indi çiçək açır, quş indi cəh-cəh vurur. Keçmiş yaddaş, gələcək isə xəyaldır. Keçmişdə artıq heç vaxt, heç nə baş verməyəcək, amma gələcəkdə olacaq. İnsan, keçmiş və gələcəkdə yaşamaq üçün, sanki hipnoz edilmişdir. Bütün dinlər insanı keçmişdə yaşamağa məcbur edir. Lakin onların qızıl dövrü keçmişdə qalıb. Dediyimiz kimi, keçmiş, indi, gələcək - bunlar üç dünyadır. Keçmiş cəhənnəmdir, çünki ölüdür, kabusdur: insanı izləyən ruhlar orda yaşayır. Yer indidir: faktikidir, indi və burada olandır. Gələcək isə cənnətdir: ümidlər, arzular, niyyətlər, həsrətlər orda cəmləşir. Bunlar üç dünyadır və insan bu üç dünyada daim hərəkətdədir. Keçmişdən gələcəyə, gələcəkdən keçmişə tullanaraq sıxışdırılmış vəziyyətdədir. İndiki məqam isə çox dəqiq, atomik bir andır – o qədər kiçikdir ki, hətta onu görmürsən. Onun fərqinə vardığınız an artıq keçmiş olur.

İndiki zamanda olmaq üçün çox diqqətli, tamamilə diqqətli olmaq lazımdır. Buna görə də indiki vaxtda olmaq zamandan kənara çıxmaq üçün qapıya çevrilir. Keçmişdən getmək olmaz, çünki keçmiş çox böyükdür - sonsuzdur. Davam edə bilərsiniz, bunun sonunu tapa bilməyəcəksiniz. Keçmişə gedir və keçmişi açmağa, keçmişi qazmağa davam edir.

İndi yaşadığımız həyat keçmişin sonu deyil. Anadan olan körpə uşağın nəfəs almağa başladığı ilk anda qışqırıb ağlayır və onun vasitəsilə nəfəs alır. Ancaq bu da başlanğıc deyil. Sonra bətnə keçmək lazım gəlir.

Bu həyatda heç bir təsadüf yoxdur, hər şey bir səbəbdən olur və biz hamımız bunu təzahür etdiririk, dərs almaq üçün şüurlu və ya şüuraltı olaraq onu cəlb edirik. Əgər ağrı olmasaydı, xoşbəxtliyin qədrini bilməyəcək və böyüyə bilməzdik.

2. RUHUN SIMVOLLARI

Simvollar fikir və anlayışları yazılı sözdən daha mücərrəd şəkildə çatdırır. Yazılı dil daha birbaşa və spesifik olmağa meylli olsa da, simvollar geniş, çoxşaxəli ideyaları və ya emosiyaları bir təsvirdə əhatə edə bilər. Məsələn, sadə bir ürək simvolu sevgi, məhəbbət və ya emosional əlaqəni, dəqiq təsvir etmək üçün bir neçə söz tələb edən anlayışları təmsil edə bilir.

Ruhani simvollar müəyyən məna daşıyan, müəyyən inancları, ideyaları və ya mənəviyyat anlayışlarını təmsil edən işarələr və təsvirlərdir. Onlar insanlara daha dərin mənəvi anlayışları anlamağa və əlaqə saxlamağa kömək edir.

Təbiət hadisələri, ölüm, həyat dərin və açılmamış sirlərdir. Beləliklə, insan öz həyatını idarə edən qüvvələri təmsil etmək üçün müxtəlif simvollar vardır ki, bu simvollar mənəvi qüvvələri konseptuallaşdırmaq üçün yaradılıb. Ruh simvollarına yuxular, incəsənət, ədəbiyyat və din daxil olmaqla müxtəlif kontekstlərdə rast gəlmək olar. Onlar şəxsi meditasiya və mənəvi təcrübədə də istifadə edilir.

Azərbaycan mədəniyyətində ruhun simvolları **quşlar, çiçəklər, işıq, göz** və **su** ilə əlaqələndirilir. Azərbaycanda belə bir deyim var: "**Göz** ruhun aynasıdır", yəni bir insanın gözləri onun daxili hissləri və emosional vəziyyəti haqqında çox şey deyən mühüm alətlərdir. Ruhani göz bədənə daxil olan və onu saxlayan kosmik enerjinin əksidir. İnsanın mənəvi gözü vasitəsilə onun ruhuna nüfuz etmək mümkündür.

Ruhun **işığı** gözlərdə əks olunur. "İşıqlı ruhu olan insan, ətrafı, ətraf mühiti və digər həyat formalarını daha çox bilən, eyni zamanda həyatda gözün göründüyündən daha çox şey olduğunu dərk edən insandır.

Ruhla ən çox bağlı olan simvollardan biri **kəpənək (uruf kəpənəyi)** olub. Kəpənəyin belə bir simvol kimi seçilməsinin əsas səbəbi onun metamorfoz keçirən bir varlıq olması idi. Əgər evə kəpənək daxil olurdusa onu həmin ailənin rəhmətə gedən nümayəndəsinin olduğu düşünülür. **Ürək simvolu,** ruh və emosional həyatla **dərindən bağlıdır.** Xristian ikonoqrafiyasında İsanın Müqəddəs Ürəyi ilahi məhəbbəti, şəfqəti və insan münasibətlərində ruhun məhəbbətinin dəyişdirici gücünü təmsil edən əhəmiyyətli bir simvoldur.

3. RUHUN MƏKAN VƏ ZAMANDA SƏYAHƏTI

Ruhlar yeni bədəndə reinkarnasiya edildikdən sonra ilkin bədənlərinə necə qayıda bilirlər?

Bu bədən öldükdən və ruh reinkarnasiya edildikdən sonra ruh keçmiş həyat bədəninə dönməyir. Tipik olaraq, ruh insan ölümündən sonra 5-ci ölçüdə və daha yuxarıda Ruh Dünyasına qayıdır və bir müddət orada qalır - sağalır, Ruh Qrupuna və Bələdçilərinə yenidən qoşulur, öyrənir, tədqiq edir və nəhayət, adətən ruhlar kimi Ruh Yoldaşları ilə növbəti təcəssümü planlaşdırır. Qruplarda reinkarnasiya olunur.

Bir çox insanlar inanırlar ki, qeyb mövcuddur və ilahi güc onlara mənəvi hədiyyələr - qabiliyyətlər verir. Ruhani hədiyyələrə sahib ola biləcəyiniz altı əlamət vardır:

1. Güclü intuisiya

İnsan bir şey baş verməzdən əvvəl sanki qəribə güclü hisslər keçirir, sanki nə isə olacağını əvvəldən duyurlar. Ruhani-mənəvi hədiyyənin ümumi göstəricisi ən çox qarın nahiyyəsində hiss edilir, bu, yüksək intuisiyanın əlaməti ola bilər.

2. Güclü Empatiya

Başqalarının hisslərini, onların ağrısını, sevincini insan öz duyğuları qədər dərindən hiss edir. Yüksək dərəcədə empatik olmaq, ruhən uyğunlaşdığınızın və başqaları ilə dərin səviyyədə əlaqə qurmağın əlaməti ola bilər.

3. Canlı Xəyallar və Görünüşlər

Əvvəlcədən olacaq hadisənin ürəyinizə damması və ya mesaj daşıyan əlamətləri görməyiniz, mənalı yuxular və görüntülər ruhani bir hədiyyəyə işarə edir, bu da ruhani aləmdən rəhbərlik aldığınızı göstərir.

4. Enerjiyə qarşı həssaslıq

Siz yerlərin və ya insanların enerjisini hiss edirsinizmi, fərqli mühitlər tərəfindən tükənmiş və ya enerjili hiss edirsiniz? Enerjiyə qarşı artan həssaslıq, başqalarının əldən verə biləcəyi incə vibrasiyaları dərk etməyə imkan verən mənəvi hədiyyəni göstərə bilər.

5. Paranormal ilə təcrübələr

Ruhlarla qarşılaşmaq, və ya digər paranormal hadisələrlə qarşılaşmaq, tez-tez baş verən paranormal təcrübələr, ruhani bir hədiyyəyə sahib olduğunuzun əlaməti ola bilər və sizi görünməyən dünyaya daha çox qəbul edir.

6. Başqalarına kömək etmək üçün güclü istək

Ətrafınızdakıları sağaltmaq, istiqamətləndirmək və ya dəstəkləmək üçün məcburi ehtiyac hiss edirsinizsə, insanlara kömək etmək üçün güclü istək çox vaxt ruhani hədiyyələrlə müşayiət olunur, çünki bu qabiliyyətlər şəfqət məqsədli olur.

Başqaları üçün yaşayan biri, qəlbi şəfqət və sevgi ilə dolu olan, başqalarını anlayan, canını fəda etməyə hazır olan, həmişə qeyd-şərtsiz sevgi verən və qayğı göstərən ***Pak ruhlu*** insandır.

"***Natəmiz ruh***"a təsir edən "***təmiz ruh***" anlayışı mədəni, dini və ya fəlsəfi inanclardan asılı olaraq müxtəlif yollarla şərh edilə bilər. Bu cür qarşılıqlı əlaqənin necə başa düşülə biləcəyinə dair bir neçə perspektiv:

Nümunə ilə təsir: Bəzi ruhani ənənələrdə təmiz ruhlu bir insanın müsbət enerji, şəfqət və müdriklik yaydığına inanılır. Belə bir insanın hüzurunda olmaq və ya onların hərəkətlərindən dərs almaqla, natəmiz bir ruha yollarını dəyişdirmək və özləri də paklığa can atmaq üçün ilham verilə bilər.

Tədris və Rəhbərlik: Təmiz nəfs murdar bir ruha fəal şəkildə rəhbərlik etməyə və onlara məsləhət verə bilər, onlara natəmizliklərini aradan qaldırmağa və ruhən böyüməsinə kömək etmək üçün məsləhətlər, təlimlər və dəstək təklif edə bilər.

Əlaqə vasitəsilə təmizlənmə: Bəzi inanc sistemləri göstərir ki, saf ruhun varlığı sadəcə əlaqə və ya qarşılıqlı əlaqə vasitəsilə başqalarına təmizləyici təsir göstərə bilər. Təmiz bir ruhla dərin bir əlaqə yaratmaqla, natəmiz bir ruh tədricən onların bəzi müsbət keyfiyyətlərini mənimsəməyə başlaya bilər.

Təsirə qarşı müqavimət: Digər tərəfdən, natəmiz bir ruh da öz bağlılıqlarına, vərdişlərinə və ya mənfi meyllərinə görə təmiz bir ruhun təsirinə müqavimət göstərə bilər. Belə hallarda, təmiz ruhun təsiri məhdud ola bilər və natəmiz ruhun dəyişməyə açıq olması üçün öz üzərində fəal işləməsi lazım ola bilər.

Karmik Qarşılıqlı Əlaqələr: Karmik nöqteyi-nəzərdən, saf və natəmiz ruhlar arasındakı qarşılıqlı əlaqənin səbəb və nəticə qanunu ilə idarə olunduğuna inanılır. Təmiz ruhun hərəkətləri və niyyətləri murdar ruhun karmik yoluna təsir edə biləcək müsbət karma yarada bilər və potensial olaraq onları təmizlənməyə aparar.

Nəhayət, saf ruhun natəmiz ruha təsir etməsi fikri mənəviyyat, əxlaq və şəxsi transformasiya ilə bağlı inanclarla dərindən qaynaqlanır. Fərqli inanc sistemləri bu cür qarşılıqlı təsirlərin necə baş verdiyinə və hansı amillərin mənəvi inkişaf və təmizlənmə prosesinə təsir göstərə biləcəyinə dair müxtəlif perspektivlər təklif edir.

Təmiz bir ruh olmaq düşündüyümüzdən daha az səy tələb edir. Biz bu istiqamətdə fəaliyyətə başladıqdan sonra geriyə baxmaq yoxdur.

İnsan ruhunun ekosistemini təmizləmək mümkündür və bunun üçün aşağıdakı addımlar atmaq lazımdır:

- Başqalarına yaxşılıq edin, səmimi qəlbdən göstərdiyiniz sevgi və qayğı həmişə özünüzə geri qayıdır.
- Beyninizi başqaları haqqında mənfi fikirlərdən uzaq tutun. Biri səni qəsdən incitsə belə, heç vaxt onu lənətləmə. Əvvəlcə çətin olsa da, bir müddət sonra insanları asanlıqla bağışlaya biləcəksiniz. Qarşınızdakı insanın bu cür davranmaq üçün yetkin olmadığını başa düşəcəksiniz.
- Unutmayın ki, heç kim sizin yaxşılıqlarınızı görməsə belə, Allah onları həmişə görür. Hər şey sizin üçün yaxşı getməsə belə, bir gün xeyrinizə dəyişəcək. Həmişə Allahın planına inanın.
- İnsanlar haqqında qeybət etməyin və onları incitməyin. Kimsə haqqında pis danışmadığınız zaman insanlar sizin münafiq olmadığınızı bildikləri üçün sizə güvənməyə başlayırlar.
- Başqasının üzündə gördüyünüz xoşbəxtlik təbəssümü ürəyinizi sevinclə dolduracaq və sizi eyni şeyi daha çox etməyə sövq edəcək.
- Başqalarının problemlərini dinləyin. Əgər kömək edə bilməsəniz də, onların ruhlarından yükün azalmasına kömək edə bilərsiz.
- Yaxşı dost, qardaş, ana, qız və s. olun. Münasibətlərinizdə həmişə dürüst olun.

Əxlaq: Kənd identifikasiyası

Yeni dünyaya göz açan insan ruhu pak olur, lakin böyüdüyü mühitdən asılı olaraq sonradan çirklənə bilir və ətraf üçün təhlükəli olur. Hər kəsin ruhu inanclara görə işıqdır. içimizdə eyni işıq və həyat qüvvəsi olduğu üçün bir insanı digər insandan ayırmaq demək olar ki, mümkün deyil. Əsl problemlər uşaq böyüdükcə özünü göstərir. Özünü müəyyən bir inanc, qrup, məzhəb və dinin içərisində tapan insanın ruhani hissləri dəyişir, bəzisi qəddar olur, bəxisi xeyirxah. İnsanlar Allaha inandıqlarını deyirlər və dünyada baş verən cinayət və müharibələrin əksəriyyəti dini inanclaran nəticəsi olur. Müəyyən bir inanca bağlı olan insan həmin inanc sistemi tərəfindən tətiklənir.

Aydınlığın əvəzi yoxdur və biz qaranlıqlığımızı dərrakə və aydınlıqla əvəz etməyə çalışmalıyıq. Bəşəriyyət ən böyük dindir və yaxşı insan olmadan yaxşı bir dini kimlik ola bilmərik. Çirklərimiz şəxsiyyətimizə görədir.

4. NƏTİCƏ

Insan ruhunun təmizlənməsi müxtəlif yollarla həyata keçirilə bilər və hər kəsin bu prosesdə fərqli yanaşmaları ola bilər. Əsas məqsəd, mənfi hisslərdən və düşüncələrdən qurtulmaq, daha mənəvi və balanslı bir həyat sürmək və insanın daxili sülh və xoşbəxtliyini tapmasıdır. Mütərəqqi düşüncənin ən yaxşı ənənələri insanın pozitiv ruhunda təzahür edir. Ruhun ekosisteminin tarazlığını bərpa etmək üçün sağlamlı bədən olmalıdır, çünki “sağlam bədəndə sağlam ruh olar”. “Xalqın bütün mənəvi enerjisini özündə cəmləşdirən, ümumbəşəri dəyərlərin daşıyıcısı, qoruyucusu və paylayıcısı məhz ziyalı təbəqədir” [2, s. 6].

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MOLLA PƏNAH VAQİFİN YARADICILIĞINDA NİKBİNLİK VƏ BƏDBİNLİK MOTİVİ

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Azərbaycan Dövlət Pedaqoji Universiteti, Azərbaycan dili və ədəbiyyatın tədrisi metodikası və metodologiyası ixtisaslaşması, II tədris ili magistrantı

XÜLASƏ

Molla Pənah Vaqif ədəbiyyatımızda milliliyi, xəlqiliyi, realizmi, nikbinliyi ilə seçilən məşhur sənətkarımızdır. Onun nikbinliyinin əksinə dostu Molla Vəli Vidadi bədbinliyi ilə seçilirdi. Biz əvvəlcə nikbinlik və bədbinliklə bağlı fəlsəfi məsələlərə toxunmuş, sonra isə Vaqifin yaradıcılığındakı bədbin tonlarda olan şeirləri nəzərdən keçirmiş və bu barədə Əli İbrahimovun fikirlərinə istinad etmişik. Vaqifin nikbinliyinin əsas səbəbini onun xalqın içindən gəlməsidir deyə bilərik. Vidadinin xalqın içində yaşaması isə onun bədbinliyinin əsas səbəbi idi. Biz məqalədə bu məsələyə toxunmuşuq. Vaqifin "Durnalar", "Bayram oldu", "Qarabağ içrə bir şair Kəlimülla Musadır", "Düşər", "ağlaram", "gəlməmiş", "ayrıldıq" şeirlərinin və ən əsası bədbinliyinin pik nöqtəsi olan "Bax" qəzəli və "Görmədim" müxəmməsi haqqında da fikirlərimizi bölüşmüşük.

Açar sözlər: Molla Pənah Vaqif, nikbinlik, bədbinlik, "Görmədim" müxəmməsi, "Bax" qəzəli.

Molla Pənah Vaqif Azərbaycan ədəbiyyatının dahi sənətkarlarından biridir. Onun ədəbiyyatımıza gətirdiyi millilik, xəlqilik, realizm, nikbinlik ədəbiyyatın inkişafında mühüm dönüş nöqtəsi oldu. Nikbinlik deyəndə Vaqif yada düşür, hansı ki sonradan bu fəlsəfə Səməd Vurğunun poeziyasının ən bariz xüsusiyyətinə çevrilir. bəs nikbinlik nədir? Nikbinlik-Həyatda ancaq yaxşı cəhətləri görmə, müvəffəqiyyətə, gələcəyə inanma; şən və gümrah dünyagörüşü; optimizm (bədbinlik əksi). Belə bir sual yaranır, bəs bədbinlik nədir? Bədbinlik- Bədbin adamın əhvali-ruhiyyəsi; ümidsizlik, gələcəyə inamsızlıq, düşkün əhvali-ruhiyyə; pessimizm. Bəs onların mövcudluğu necədir?

Bunu belə izah edə bilərik: qədim Çin təbii fəlsəfəsi olan İn və Yan. Bütövlük iki hissədən, İn və Yandan ibarətdir. İn kölgəli tərəf, Yan isə günəşli tərəf mənasını verir. Yəni hər şey iki qütbdən ibarətdir. Bir qütbün güclü olduğu yerdə ikinci qütb də özünü büruzə verir. Daha açıq desək qaranın olduğu yerdə ağ, ağın olduğu yerdə qara vardır və bu qütblər dəyişə bilər. İn Yana və ya əksinə çevrilə bilər. Əsas məsələ bu iki qütbün biri olmadan digərinin də mövcud ola bilməməsidir. Hər kəs nikbinlik və bədbinliyin vəhdətindən ibarətdir. İnsan sadəcə bədbin və ya sadəcə nikbin ola bilməz, məsələ tərəzidə hansının daha ağır olmağıdır. Məsələn, yarısına qədər su ilə doldurulan stəkana bəzilərinin yarısı doludu, bəzilərinin də yarısı boşdu deməyi onların nikbinliyinin və ya bədbinliyinin göstəricisi deyilmi? Fəlsəfə və psixologiya elmləri xüsusilə nikbinlik və bədbinlik terminləri ilə maraqlanırlar. Əli İbrahimov bu barədə qeyd edirdi: "Fəlsəfə tarixində nikbinlik dünyagörüşü bu və ya başqa dərəcədə bir çox mütəfəkkirlər: məsələn, qədim dövrdə Aristotel, Epikür, yeni dövrdə isə alman filosofu Qotfrid Vilhelm (1646-1716) Leybnits təbliğ etmişdir. Leybnitsin mütləq nikbinliyi nəticə etibarilə şərin, bədbəxtliklərin, həyatdakı bəlaların bəraətləndirilməsinə gətirib çıxarardı. Bədbinliyi alman irrasionalist filosofları Sopenhaur və E. Hartman, italyan şairi C.Leopardi əsaslandırırdı. Azərbaycan klassik ədəbiyyatında isə M.V.Vidadi bədbinlik, Vaqif isə nikbinlik – optimizmin tarixi nümunələrini özündə ehtiva edən əsərləri ilə diqqəti-nəzəri cəlb edir" [2, s.68-69]. O həm də qeyd edir: "Vaqif nikbinliyindən danışarkən dünya ədəbiyyatında məşhur olan Anaxreontik poeziya, gedo- nizm, epikurizm anlayışları yada düşür. Antik dövrdə Yunanıstanda bu məsələni, yəni şərab, nəşəli günlər, sentimental sevgini, fəlsəfi-etik nöqteyi-nəzərdən sistemləşdirib dünyagörüşü kimi əsaslandıran Kirenli Aristipp adlı filosof idi.

Gedonizmə (yunanca-nəşələnən mənasın verir) çox yaxın olan başqa bir cərəyan məşhur antik yunan filosofu Epikurun adi ilə bağlıdır. Epikur insanların ölüm qorxusundan və tanrı xofundan azad olmalarını xoşbəxt həyatın əsas şərti hesab edirdi.

Vaqifdəki nikbinliyin köklərində gedonik-epikurçu nikbinliyi axtarmaq düzgün olmazdı. Vaqif nikbinliyinin mahiyyət və məzmununu araşdırmazdan əvvəl Vaqifəqədərki Azərbaycan şeirinin vəziyyətini yada salmalıyıq. Məlumdur ki, sonsuz qəm, kədər, qüssənin hökmran olması ölkədəki saysız-hesabsız yadelli işğalçıların basqını, daxili müharibələr, zəhmətkeş insanlara edilən zülm, saf məhəbbət hisslərinin tapdanması ilə bağlıdır. XVIII əsrin əvvəllərindən həyata realist gözlə baxan Vaqif nikbinliyə daha çox önəm verir, dostunu da buna dəvət edir" [1, s.70-71]. Bəs Vaqifin nikbinlik fəlsəfəsinin əsas qayəsi məqsədi nə idi? Bu suala da Əli İbrahimov belə cavab vermişdi öz yazılarında: "Vaqifin nikbinlik fəlsəfəsində əsas qayə, əsas məqsəd yaşadığı diyarda həmvətənlərini də özü kimi görmək, bu dünyanın təbii məşəqqətlərini ürəyə salmamaq, ürəyi yükləməmək , hamının dərdini öz dərdi, hamının sevgisini öz sevgisi kimi görmək, birlikdə nikbinliyi daim qorumaq, bədbinliyin girdabından xilas olmaq kimi bəşəri, insani duyğular aramsız davam edir, bitmək-tükənmək bilmir" [1, s.65]. Vaqifin nikbinliyinin səbəbi onun xalqın içindən gəlməsidir. Bəs xalqın təsiri niyə Vidadini nikbin, Vaqifi bədbin etmədi? Bu bəlkə də Vaqifin sonradan sarayda yaşaması ilə bağlıdır, bildiyimiz kimi Vidadi sarayda yaşamaqdan imtina etmiş, sadə həyat sürmüşdü. Ya da yuxarıda qeyd etdiyimiz kimi insanın özündə olan bir xüsusiyyətdir, bəlkə də Vaqif xislət baxımından nikbin, Vidadi isə bədbin idi. Üçüncü bir fikir isə Vaqifin əvvəldən bədbin olması, lakin saray mühitində olduğu üçün bunu ört-basdır etməsidir. Bu fikrin tərəfdarı olanların əsas əsaslandığı Vaqifin "Görmədim" müxəmməsi və "Bax" qəzəlinin bədbin və şikayətçi notlarla yazılması, hər iki əsərdə dövranın pis olması və insanların vəfasızlığından danışılmasıdır. Bu belə əsas verir ki, bu şəkildə bədbin tonlar birdən yarana bilməzdi. Vaqif əvvəldən də bu fikirdə olmuş, lakin saray mühitində olduğu üçün yazmamışdı. Əslində Vaqifin bəzi şeirləri vardır ki, onlarda bu bədbin tonları sezə bilirik. Məsələn, "ağlaram", "gəlməmiş", "ayrıldıq", "bayram oldu", "durnalar", "düşər", "qarabağ içrə bir kəlimüllah Musadır" şeirləri və s. "Ağlaram" şeirində aşiq sevgilisindən ayrı düşdüyünü, gecə-gündüz ağladığını, bədəninin muyə(tükə) döndüyünü, cisminə od düşüb canını yandırdığını deyir. Qəzəlin məqtə beytində şair özünə müraciət edir və yaxşı həmdəmini itirdiyini, ömrü firavan olduqca ağlayacağını deyir. Şeirdə göründüyü kimi sevgilisini itirən aşiqin kədər dolu hıçqırıqları eşidilir:

Yaxşı həmdəm olmasa şad olmaq olmaz, Vaqifa,
Ağlaram ta ömrüm olduqca firavan, ağlaram [3, s.153].

Başqa bir şeirə nəzər salsaq eyni bədbinliyi görərik. "Gəlməmiş" şeirində də aşiq sevgilisinin gəlmədiyini, ixtiyarının da onunla getdiyini və ixtiyarsız olduğunu deyir. Əgər əcəl gəlsə, ona canını verməz, çünki canını vermək üçün fərmanı gəlməyib. Bu şeirdə də sevgilinin aşiqdən uzaq düşdüyünü görürük:

Deməsin, Vaqif, əcəl kim, gəlsə məndən can alır,
Kimdir ona can verən, fərmani-yarım gəlməmiş? [3, s.157].

Şairin "Ayrıldıq" şeirində aşiq yar ilə danışmadan, tanışmadan ayrıldığını, küsülü olduqlarını və barışmağa möhlət olmadığını deyir. Vaqif iqrarsız və vəfasız birini sevdiyindən, bütün çəkdiyi cəfaların boşa getməyindən heyiflənir.

Qərib-qərib durduq biganələr tək,
Soyuq-soyuq baxdıq divanələr tək.
Dönmədik başına pərvanələr tək,
Eşq oduna yanışmadıq, ayrıldıq! [3, s.19].

“Bayram oldu” şeiri şairin yaradıcılığında xüsusi yerə malik şeirlərdəndir. Bu şeir Vaqifin ilk qoşmalarındandır. Şair bu əsəri Şuşa şəhərinə gəlməmiş, Tərtərbasarda məktəbdarlıq etdiyi illərdə yazmışdır. Şeirdən, onun hələ subay olduğu aydınlaşır. Şair yoxsul həyatından danışır. Evdə düyünün, yağın çoxdan tükəndiyini, xalqın şəkər, qənd içrə yaşadığını, amma özlərində heç zoğalın da olmadığını deyir.

Bizim bu dünyada nə malımız var,
Nə də evdə sahibcamalımız var.
Vaqif, öyünmə ki, kamalımız var,
Allaha şükür ki, kamal da yoxdur. [3. Səh. 113]

Durnalar şairin bədbin tonlarla yazılan şeirlərindən biridir. Vaqif “Durnalar” rədifli şerini Vidadinin durnalar şeirinə cavab olaraq yazmışdır. XIX əsrin məşhur şairi Qasım bəy Zakir də Bakıda sürgündə olduğu zaman hər iki şairin əsərinə cavab olaraq durnalar mövzusunda şeir yazmışdır. Durnalar mövzusu həsrət, qəriblik mövzusudur. Şair şeirdə yarın həsrətində olduğunu deyir.

Xeyli vaxtdır, yarın fərağındayam,
Pərvanə tək hüsnün çırağındayam,
Bir ala gözlünün sorağındayam,
Görünürmü, görün, gözə, durnalar! [3, s. 96]

Vaqif “Düşər” şerini Vidadiyə yazmışdır. Vidadi Tiflisdə II Iraklinin sarayında həbsə alınır və sonradan azad edilir. Vidadi azad olduqdan sonra Vaqif bu şeri yazıb dostuna təskinlik verir.

Kim ki, sevdayi-səri-zülfü-pərişanə düşər,
Gah zindanə, gəhi çahi-zənəxdanə düşər [3, s.151].

Dərd o insana ki, kamildir, kamil insanlar sonda zindana düşür, məhbəsdə namərdlərin olmadığını, mərdlərinsə məhbəsi meydan bildiyini, yaxşıların yamanlıq gördüyünü, ləlin daşların içində həmişə xaraba düşdüyünü, zindanın bir sənə (Vidadi), bir mənə (Vaqif) və Yusifi-Kənana düşdüyünü deyir.

Eşqə düşmək sənə düşməz, qocalıbsan belə dur,
Belə işlər yenə Vaqif kimi oğlanə düşər [3, s.151].

Vidadi həmin şeirə cavab yazır və son beytində belə ifadə edir:

Nə qədər olsa qoca, gərçi Vidadi xəstə,
Yenə Vaqif kimi, əlbəttə, yüz oğlana dəyər [3, s.238-239].

“Qarabağ içrə bir şair Kəlimülla Musadir” şeiri bədbin tonlarda yazılsa da şeirdə nikbinlik vardır, çünki şair dövrün dəyişəcəyindən və ona qiymət veriləcəyindən ümidlidir. Bu barədə Həmid Araslının hazırladığı şairin şeirlərinin toplusunda deyilənlər fikrimizi təsdiq edir: “Bu şeri Vaqif Şuşa şəhərində məktəbdar olduğu zaman hələ saraydan kənar yoxsul bir həyat keçirdiyi illərdə yazmışdır. Burada şair Qarabağda Cavanşir xalqı içərisində şerin çox sevildiyindən, özünün çətin həyat keçirməsindən bəhs edir və göstərir ki: Qarabağda şairi möcüzə yaradan Musa kimi qarşılayırlar. Cavanşir əhli bayatıya hünər kimi baxır. Cavanşir nəsli qələm qədrini bəni-Israil, Musanın atdığı zaman əjdahaya çevrilən əsasını qiymətləndirdiyi kimi qiymətləndirir. Ürəyi işıqlı

adamlar ömürlərini nadanlar içində keçirməlidir, çünki çıraq qaranlıq dekabr gecələrində daha artıq hökmranlıq edər. Şair ümidvardır ki, bu qara günlər axıra qədər belə davam etməsin. Vaqif özünün Şuşa şəhərində yaşamasını lələn çaxmaq daşı içərisində olmasına bənzədir" [3, s.239]

Qarabağ içrə bir şair kəlimüllah Musadır,
Cavanşir içrə bir mövzun bayati dəsti-beyzadır.

Qələm qədrin əsayi-əjdəhapeykərcə bilməkdə
Bəni-İsrailə ali-Cavanşir yəni həmtadır [3, s.152].

Göründüyü kimi, şairin bu kimi şeirlərində bədbin tonları sezə bilirik. Həyatının son dövrlərində yazdığı "Bax" qəzəli və "Görmədim" müxəmməsində isə bədbinlik əsas xətt olur. Yaqub Babayev bu barədə qeyd etmişdir: "Bax" qəzəli və "Görmədim" müxəmməsi sənətkarın bizə məlum son şeirləridir. Hər iki poetik nümunədə şair bir növ özünün sürəkli yaradıcılıq ənənəsindən kənara çıxır. Yəni o, şən, şux, həyatdan zövq- səfa duymağa çağıran, gözəlləri mədh edən, dilbər eşqi ilə yaşayan yaradıcı şəxsiyyətə bənzəmir. Birinci şeirdə müəllif cahan hadisə- lərinin ağılagəlməz, gözlənilməz gedişatından ibrət almağa, zalımın zülmünün yerdə qalmayacağına inam bəsləyən, nəsihətçiyə, ikinci şeirdə isə bütövlükdə cəmiyyətə, bəşəri xilqətə, onun başdan-başa şərə bürünmüş xislətinə və əməlinə qarşı üsyan edən ittihamçıya bənzəyir. Özünü bəşərin cinayət səhrasında tənha hiss edən sənətkar hər iki lirik əsərdə son olaraq Allaha, onun rəsulu Məhəmmədə (ə.s.) və «ali- əbaya üz tutmağı, onlara sığınmağı yeganə çıxış yolu hesab edir" [1, s.732]. "Bax" qəzəli Vaqifin yaradıcılığında xüsusi yerə malik əsərdir. Bu barədə Həmid Araslı qeyd etmişdir: "Vaqif bu şeri 1797-ci ildə Ağa Məhəmməd şah Qacar öldürüldükdən sonra yazıb dostu Vidadiyə göndərmişdir. Burada şair, Vidadini zəmanədə baş verən hadisələrdən ibrət almağa çağırır. Zülm əhlinin bərbad olmasından, gecə xalqa qiblə olan bir çırağın (şaha iranlıların qibleyi-aləm deyə müraciət etmələrinə işarədir) sübh sönməsindən, qürurla dolu olan şah başının təpiklər altına düşməsindən bəhs edir. Şair şahın onu cəza ilə öldürmək üçün əmr verməsini xatırlayıb özünün qurtarmasını dəmirçinin zalım şahın cəzasından qurtamasına bənzədir:

Qurtaran əndişədən ahəngəri-biçarəni,
Şah üçün ol midbəri-təbdil olan mismara bax! [3, 239-240]

– deyir. Bu beyt bir rəvayətin bədii ifadəsidir. Rəvayət belədir: müəyyən məqsəd üçün dəmirçini öldürtmək istəyən bir şah ona qəsdən bir gecədə qırx min at mıxı hazırlamağı əmr edir. Dəmirçi səhərə qədər yatmır, ölüm saatını gözləyir.

Səhər tezdən şahın adamları qapını döyürlər. Ancaq onlar at mıxı yox, dəmirçini cəzalandırmaq üçün yox, gecə ölmüş şahın tabutu üçün dörd mismar hazırlamağı xahiş edirlər".

Ey Vidadi, gərdişi-devrani-kəcrəftarə bax!
Ruzigarə qıl tamaşa, karə bax, kirdarə bax!

Əhli-zülmü necə bərbad eylədi bir ləhzədə,
Hökmü adil padşahi-qadirü qəhharə bax!

Sübh söndü şəb ki, xəlqə qiblə idi bir çırağ,
Gecəki iqbalı gör, gündüzdəki idbarə bax! [3, s.156]

- deyən Vaqif dövrün necə vəziyyət almasından danışır:

İbrət et Ağa Məhəmməd xandan, ey kəmtər gəda,
Ta həyatın var ikən nə şahə, nə xunxarə bax!

Baş götür bu əhli-dünyadan ayaq tutduqca qaç,
Nə qıza, nə oğula, nə dusta, nə yarə bax!

Vaqifa, göz yum, cahanın baxma xubü ziştinə,
Üz çevir ali-əbayə, Əhmədi-Muxtarə bax! [3, s.156]

Göründüyü kimi, şeirdə Vaqif İnsanları Ağa Məhəmməd xandan ibrət almağa çağırır. Bu dünyadan qaça bildikcə uzağa qaçmalı və geridə qoyduğumuz oğlumuz, qızımız, sevdiyimiz insanları unutmalı, üzümüzü Allaha və onun rəsuluna çevirməliyik deyən Vaqifin ömrünün sonlarına doğru Vidadi ilə həmfikir olmağa doğru yol getdiyini görürük. Halbuki Vaqif Vidadiyə bu dünyanın neymətlərindən faydalanmağı məsləhət görürdü.

Həyatının son dövründə qələmə aldığı digər əsəri "Görmədim" müxəmməsidir. Müxəmməs barədə Həmid Araslı yazırdı: "Bu müxəmməs Vaqifin son əsərlərindəndir. Ağa Məhəmməd şah Qacarın Şuşa şəhərində öldürülməsindən sonra xanlığı əlinə alan Məhəmməd xan Cavanşirin rəftarından və ümumiyyətlə, feodal hakimlərin zülm və əzabından təngə gəlmiş şair bu əsərində öz dövrünün ictimai dərdlərindən bəhs etmişdir" [3, s.241]. Müxəmməsdə sanki Vaqif bu günə qədər yazdığı şeirləri bir kənara atır və yeni bir şair olaraq qarşımıza çıxır

Mən cahan mülkündə, mütləq, doğru halət görmədim,
Hər nə gördüm, əyri gördüm, özgə babət görmədim.
Aşinalar ixtilatında sədaqət görmədim,
Biətü iqrarü imanü dəyanət görmədim,
Bivəfadan lacərəm təhsili-hacət görmədim [3, s.185 .

Şeirdə Vaqif cahanda doğru bir şey görmədiyini, gördüklərinin həmişə əyri olduğunu, yaxınlarda sədaqət olmamasından şikayətlənir. Sultanlardan tutmuş adi insanlara, özünü əqidə yolçusu adlandıran dərvişlərə qədər hamının dünyanın malına aludə olmaları, insanların hər sözünün-söhbətinin böhtan və şərdən ibarət olması şairi qəzəbləndirir. Dünya fitnə yumağına çevrilib, işçilərdə rəhbərə itaət , sahiblərdə isə doğru əməl yoxdur, ixtiyar sahibləri ədalətdən yoxsuldurlar, yaxşı insanlar isə puldan.

Alimü cahil, müridü mürşidü şagirdü pir,
Nəfsi-əmmarə əlində sərbəsər olmuş əsir,
Həqqi batil eyləmişlər, işlənir cürmi-kəbir,
Şeyxlər şəyyad, abidlər abusən qəmtərir,
Hiç kəsdə həqqə layiq bir ibadət görmədim [3, s.185].

Kimə yaxşılıq edib qəmli gününü şən edirsənsə, sənə bədbəxtlik verər həmin insan, aləmdə elə dost yoxdur ki yoxdur ki ondan ədavət görməyəsən. Alim, cahil, mürid, mürşid hamısı nəfsin əlində oyuncağa çevrilib. Haqqın batilə çevrildiyi dünyada ancaq şər, günah işlər olur, cəmiyyət o qədər pis vəziyyətdədir ki, heç kimdə haqqa layiq ibadət yoxdur.

Eyləyən viranə Cəmşidi-Cəmin eyvanını,
Yola salmış, bil ki, bəzmi-işrətin çəndanını,
Kim qalıbdır ki, onun qəm tökməyibdir qanını,
Dönə-dönə imtahan etdim fələk dövranını,
Onda mən bərəkslikdən özgə adət görmədim [3, s.186].

Dünya Cəmşidin camını viranə qoydu, fələk dövranını nə qədər imtahan etsəm də , həmişə əksliklər gördüm. İnsanlarda şükür etmək duyğusu, namus, həya qalmayıb, nə qədər dünyanı gəzsəmdə etibar görmədim deyir şair. Yaqub Babayev yazır: " Etdiyi yaxşılıqların, xeyirxahlıqların müqabilində qədrsizlik və xəsarət görür. Həya, namus, ar, etibar və etiqadını itirmiş cəmiyyətə qarşı kəskin nifrət və etirazını bildirir. Aliləri (ağıl, mərifət və kamal sahiblərini) zəlalət torpağında, alçaqları, cahil və nadanları mötəbər məqamda görən sənətkar acizləşir. Haqqa üz tutmaqdan başqa çıxış yolu tapa bilmir. Sərvətin də, hər cür cah-cəlalın da, zülfünə, xəttü-xalına tərif yazdığı gözəllərin də ötəri, aldadıcı, illüziyadan ibarət olduğu qənaətinə gəlir" [1, s.734].

Dövlətü iqbalü malın axırın gördüm tamam,
Həşmətü cahü cəlalın axırın gördüm tamam,
Zülfü ruyü xəttü xalın axırın gördüm tamam,
Həmdəmi-sahibcəmalın axırın gördüm tamam,
Başədək bir hüsnü-surət, qəddü qamət görmədim [3, s.186].

Göründüyü kimi şair "Bax" qəzəlində olduğu kimi sonda Allaha sığınır və ondan başqa heç kimdə lütfü inayət görmədiyini deyir.

Baş ağardı, ruzigarım oldu gün-gündən siyah,
Etmədim, səd heyf kim, bir mahi rüxsarə nigah,
Qədr bilməz həmdəm ilə eylədim ömrü təbah,
Vaqifə, ya rəbbəna, öz lütfünü eylə pənah,
Səndən özgə kimsədə lütfü inayət görmədim [3, s.186].

Beləliklə, Vaqifin yaradıcılığında olan və nikbinliyindən belə daha təsirli bədbinliyinin üstündə qurulan bu iki əsər təkcə Vaqifin yaradıcılığında yox, Azərbaycan ədəbiyyatında bu tipli yazılan əsərlərin içində ön sıralarda durur. Bu əsərləri yazan Vaqiflə Vidadinin deyişdiyi Vaqif eynidirmi deyə baxsaq görərik ki, iki şair arasında nikbinliyin və bədbinliyin arasında olan təzad qədər təzad vardır:

Toy-bayramdır bu dünyanın əzabı
Əqli olan ona gətirər tabı,
Sənin tək oğlana deyil hesabı,
Hər şeydən eyləyib qubar ağlarsan! [3, s.220]

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Journalism

The effect of social media on the adolescent psyche: the examples of YouTube, TikTok and Instagram

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The media are evolving along with information and communication technologies. The quality of content is growing rapidly, the presentation of information is transformed to meet the needs of the viewer. The development of the Internet has changed the usual understanding of the mass media, and new media have occupied their niche, gaining popularity among the younger generation. New media are understandable and interesting to the younger generation because of the compressed presentation of information.

The teenager of the XXI century thinks in a clipped way, and prefers video content that will reveal the topic in a short time without loading with additional information. That's why today short videos in TikTok and Instagram have become so popular, even video hosting YouTube currently has an analogue of the smart TikTok feed, which is called Shorts. It offers short videos on the topic of the channels a person has subscribed to. The smart feed generates content based on channel subscriptions and videos that the user has reacted to: added to the library, liked or commented on, but it's not as popular. People are used to the fact that YouTube has a video timing of more than 10 minutes, hence, a person turns to this platform when they have a lot of time to get the information they need. YouTube is keeping up with the times, but unfortunately, short videos are not popular on this platform, which is not the case with Reels on Instagram.

The smart feed with short clips has become a competitor to TikTok. Most people keep personal blogs in the social network Instagram, there are more opportunities for communication with their subscribers. The recommendation feed gives out clips on the same principle as TikTok, therefore, you can gain views and likes, if you put the right hashtags to the video. This has advantages for the development of the page and your personal brand. Audience reach increases. If the video is in the recommendations, a person goes to the author's page, thereby increasing views of the personal blog, and if the video was shot with a certain mask (a feature appeared in 2019), it increases the rating of the account and gives additional advertising for the creator of the mask. After all, by creating a mask that gets noticed by the user, you can trigger a wave of content that will promote the account without investing in advertising.

At the moment, the most popular application is TikTok. D.A. Bogomolova in her research emphasises the fact that the video hosting has gained its audience due to the takeover of the Musical.ly music site: ‘Already in 2018, the service's audience amounted to more than 800 million people per month. The large reach in such a short period of time is also due to the fact that in 2018 TikTok absorbed the music service Musical.ly, thus adding 100 million people’ [1,573].

Video content has become an integral part of everyone, especially for a teenager who is registered on the social network Instagram or on the video hosting services YouTube and TikTok. The format of consuming short videos has become very popular. On these platforms, one can not only watch

news and be entertained, but also learn. There are many accounts that help a teenager to master the school programme. A vivid example is a chemistry teacher from Almaty, who created an account in TikTok, and explains chemistry to the younger generation on the example of the Japanese anime 'Naruto'. Japanese culture and anime are very popular today. In just two months, the young teacher was able to attract an audience of 2 thousand active subscribers.

Rashit Ilyasov, the author of the news feed on the Tengrinews news portal, explains the news block to teenagers in an accessible and clear way. He runs the TikTok account of the information portal. His short clips about what Rashit can often be found in the recommendation feed, because his presentation is interesting to both children and adults. Print journalists have only 3 seconds to attract a potential reader to their material. This can be done with a good headline, a lead or a bright picture. Journalists working with video content have a little more time to attract attention, 7 seconds, but the task is more difficult. The viewer must be attracted simultaneously by the picture, text and presentation. Rashit Ilyasov copes with this task successfully. In his videos he presents only the essence, trying to fit it into one minute. Since a modern teenager is not able to concentrate on one thing for a long time, especially if it is news.

Teenagers are not more passionate about the problems of society and the world than they are about their own, so 1-minute news is an acceptable and easily digestible product. Each published video by the news portal in TikTok gains at least 45 thousand views, and the most popular news video has gained 2.6 million views. The account has more than 10 million likes and 359 thousand active subscribers. Also, the account has a convenient interface, they divided all the news by playlists. Therefore, an interested user can find the news at once, without scrolling through a large number of video content on various topics. The first playlist just touches on issues that are interesting to schoolchildren, it is called 'School Questions'. This playlist contains all relevant and reliable information for schoolchildren. Tengrinews is not the only media outlet that promotes its content in TikTok. Khabar, KTK, Almaty TV and Atameken business have their own accounts. But their promotion is not as active as that of Tengrinews.

Teenagers are subject to scattered attention, which is normal due to their age. They want to learn, socialise, have fun, study and preferably all at the same time. The coronavirus pandemic has pushed school children into just such a regime. Distance learning has made adjustments to the normal way of life of everyone in the world. At the time of the lockdown, there was an increase in the number of registered users on the social network TikTok, which people around the world claim helped them survive the quarantine. Time spent at the screens of phones increased, if before the pandemic teenagers spent about 4 hours a day on the phone, then during the period of restrictive measures the time increased 2 times. This often leads to conflicts between the teenager and the parent. Dialogues usually do not lead to anything because everyone stands on their own, without getting into the essence of the issue. The parent is worried about a waste of time, and the teenager, on the contrary, can not explain and justify why this type of activity helps him to relax and cope with a difficult period of life. There is a conflict between fathers and children. Social networks and their role in the life of a teenager are in most cases incomprehensible to the older generation. Such a collision can give an impetus to a dialogue between parent and child, or, on the contrary, give rise to a conflict situation. The global problem of people in the world is that with the advent of social networks and messengers, people have stopped communicating in person. It has become easier for everyone to write a text, wait for some time for a reply, but in no case to call or meet in person. Dialogues have grown into correspondence, and live communication has become a necessity only at school, in extra classes and circles. On this ground, conflicts arise; if not resolved properly and do not talk calmly with the teenager, a breakdown can occur, which will take the conflict to a deeper level. The teenager closes in on himself whenever there is a conflict with a parent. The fact that this quarrel can cause a depressed and depressed state in the child cannot

be ruled out. If such a case occurred, it is better not to delay the resolution of the problem. The main thing is not to forget that social networks are not always harmful.

TikTok has become a news feed, an entertainment base for teenagers, replaced tutors for schoolchildren. A large number of accounts appeared on the platform, which shared useful information about the learning process, flyhacks and helped to tighten knowledge in different spheres of activity. Content on TikTok can be divided into four segments: entertainment, skills, content about life, and content about creativity.

Thus, during the pandemic, accounts have appeared that teach the art of photography and editing, understand useful functions of Word, Power Point, Excel, use songs and films to help better understand different languages, improve diction, learn cooking, beadwork, origami and much more. Thanks to video hosting, needlework has become popular, with every second teenager taking up beadwork since 2021. This has a positive effect on the development of fine motor skills, also helps to calm the nervous system.

But also we can not deny the fact that most often teenagers go to the Internet not for knowledge and news, but for emotional discharge. Throughout the day, being at school, attending classes, visiting circles and doing extra work, schoolchildren go to social networks to socialise, distract themselves from everyday problems and relieve their brains from studying. Everyone does it in different ways, but everyone prefers to immerse themselves in the world of video. In his study 'The role of TikTok in the socialisation of children and adolescents', Y.V. Dvoryanchikov stresses the fact that his research revealed that the application, by forming primitive thinking through appropriate content, develops the habit of repeating everything after everyone else through a system of challenges, and to an already 'prepared' child with a broken critical thinking and will to slip those topics that need to be repeated' [2]. This opinion is debatable, because not all teenagers are engaged in the fulfilment of challenges, some do not even maintain their accounts, but just go there for content.

The Internet is not always bad and dangerous for teenagers, there is a lot of useful content on the Internet space. A parent's main job is to control the amount of time their child spends online and the quality of content they consume. The parent will be able to guide their child in the right direction, and then surfing the Internet can bring not only relaxation and emotional release, but also benefits.

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Art History

MIR MUSAVVIR CREATIVITY

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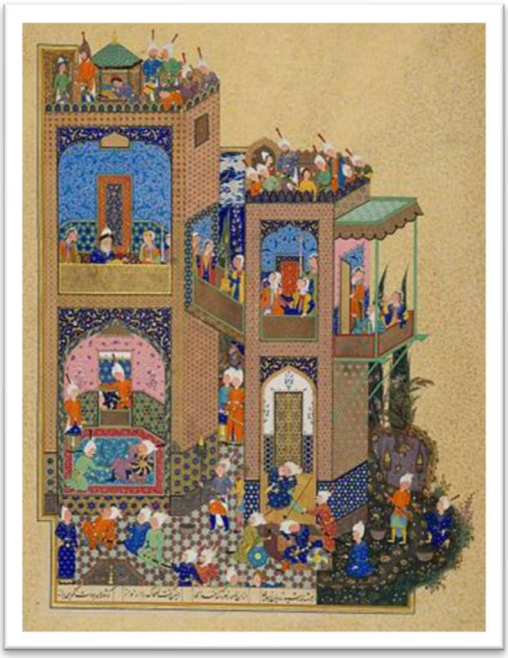
Abstract:

It is not known when and with which work Mir Musavvir started his independent creativity. One of his still known works, the miniature "Ardashir and Gulnar" painted for the "Shahname" was made in 1527 according to the inscription on the portal. The multi-figure composition of the works "Zohhak's horror", "Manuchohr's accession to the throne" and "Zal Mihrab receives the gifts sent from Kabul", the expressive solution of the main character and additional characters, and the great skillful description of the architectural forms and elements of the artist Dust Mohammad fully justifies the praises he said about him. While writing that he worked together with Aga Mirek in "Khamsa" and "Shahname" prepared for Tahmasib, Dust Mohammad notes that their works are at a very high level, and it is impossible to evaluate them properly.

Key words: Miriature, Tabriz, Hand writing, Pictures.



Rəssamın imzalı əsərlərindən birində saray süfrəçisi Sərxan bəyin portreti təsvir olunur. Fiqurun canlı və dinamik həlli, rəsmin səlis və plastikliyi, surətin ifadəliyi və s. sənətkarlıq keyfiyyətləri Mir Müsəvvirin həqiqətən məharətli portret ustası olduğunu sübut edir. Üslub xüsusiyyətlərinin eyniliyinə görə "Şah və qulam" qoşafiqurlu kompozisiyanı (London, Britaniya muzeyi) da Mir Müsəvvirə aid etmək olar.

Mir Müsəvvirin yaradıcılıq üslubunu, sənətkarlıq qüdrətini nümayiş etdirən ən görkəmli əsəri 1539-1543-cü il tarixli "Xəmsə"də "Sirlər xəzinəsi" nə çəkdiyi miniatürdan ibarətdir. "Ənuşirəvan və bayquşların söhbəti" hekayəsinə çəkilmiş bu illüstrasiya ilk baxışda gözəl bir mənzərə təsirini oyadır. Möhtəşəm, zəngin dekorativ bəzəkli sarayın xarabaya, vəhşi heyvan və quşların məskəninə çevrilmiş qalıqları, onu əhatələyən qamətli sərv, çiçəklənmiş ağaclar, yaşıl budaq, güllü-çiçəkli, ağ və göyümtül buludlu qızılı səma təbiət təsvirinə füsunkar gözəllik verir.

Əsərin ideya məzmunu, əsas süjet xətti kompozisiyanın mərkəzində təsvir olunan şah və vəzirin obrazları vasitəsilə açılır. Kəhər atın belində gedən Ənuşirəvan qatırla arxasınca gələn vəzirə tərəf dönərək, əli ilə sökük piştağın üstündə oturmuş bayquşları göstərir və onların nə söhbət etdiklərini soruşur. Vəzir cavab verir ki, bayquşlardan biri o birisinin qızını istəyir. O isə əvəzində süd bahası olaraq bir neçə xaraba kənd tələb edir. Qızı istəyən bayquş deyir: "Şahımız bu işə, onun zülmü sayəsində məndən min xaraba kənd ala bilərsən!". Vəzirin cavabı dahi Nizaminin bayquşların dili ilə hökmdara dediyi dərin hikmətli sözlər şahın göstərdiyi səmtdə, sarayın yuxarısında yazılmışdır.

Başqa miniatürlərdən fərqli olaraq burada ədəbi mətn kompozisiyasının ayrılmaz hissəsinə çevrilir, təsviri vasitələrlə birlikdə əsərin ideya məzmununun açılmasına xidmət edir.

Miniatürda hər şey kompozisiya quruluşu və obrazların həllindən tutmuş ən kiçik ünsürlərə qədər yüksək bədii zövqlə, misilsiz ustalıqla işlənmişdir. Surətlərin canlı və ifadəliliyi, mənzərənin, heyvan fiqurlarının real təsviri, kompozisiyanın şux və əlvan rənglərin vəhdətindən doğan zəngin koloriti və dekorativliyinə, dərin emosional təsir qüvvəsinə görə bu miniatür yalnız "Xəmsə"nin deyil, ümumiyyətlə, XVI əsr Təbriz məktəbinin ən dəyərli əsərlərindəndir.

Şübhəsiz ki, belə kamil firça ustasının öz oğlu Seyidəlinin bədii tərbiyəsində və yaradıcılığının formalaşmasında mühüm rolu olmuşdur. Mir Seyidəlinin müstəqil yaradıcılığının erkən çağları və ilk əsərləri haqqında heç nə bəlli deyil. Güman etmək olar ki, Şah Təhmasibin sevimli rəssamlarından olan Mir Müsəvvir oğlunu da saray emalatxanasına cəlb etmiş və gənc rəssam Orta Şərqin ən qüvvətli sənət mərkəzlərindən olan bu emalatxanada Sultan Məhəmmədin rəhbərlik etdiyi yaradıcı kollektivlə birlikdə işləyərək öz sənətkarlığını təkmilləşdirmişdir.

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Medieval Azerbaijani art

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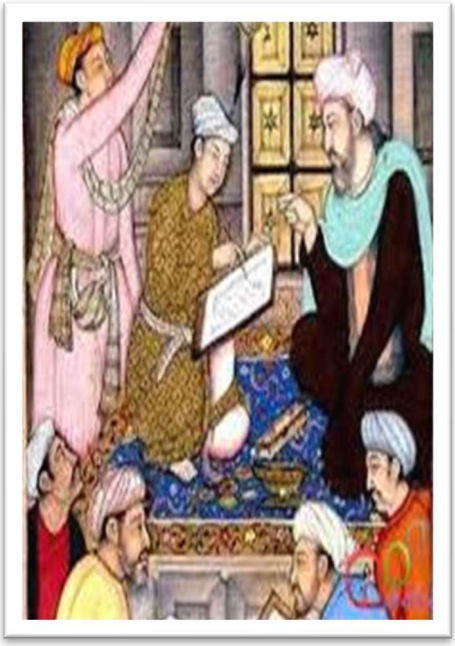
Abstract:

When speaking of Azerbaijani art, carpets are the first thing that comes to mind. The history of carpet weaving dates back to ancient times. The patterns and depictions on carpets have been passed down through centuries. Today, the beauty of these carpets has reached us, especially through examples from the 18th and 19th centuries. The fame of Azerbaijani carpets has spread worldwide, primarily created within several carpet-weaving schools. Among the most famous are the Tabriz, Ganja, Gazakh, Guba-Shirvan, and Karabakh schools. Beautiful embroidery, jewelry, and other branches of decorative and applied arts have also contributed invaluable gems to Azerbaijani cultural heritage.

One of the most remarkable aspects of 18th-19th century Azerbaijani visual art is its wall paintings. Wall paintings from this period, such as those found in Shaki, Shusha, Guba, and Lahij, continue to amaze us today. The murals of Shaki Khan's Palace were painted at various times by masters like Abbasgulu, Ganbar Garabagi, Aligulu, and Gurbanali. Here, one can find motifs from the animal and plant world, hunting and battle scenes, and images of famous characters from Nizami's poems "Khosrow and Shirin," "The Seven Beauties," and "Leyli and Majnun."

In 1828, Azerbaijan was divided into two parts, with Northern Azerbaijan becoming a province of the Russian Empire.

Key words: Key, Miniature, Document.

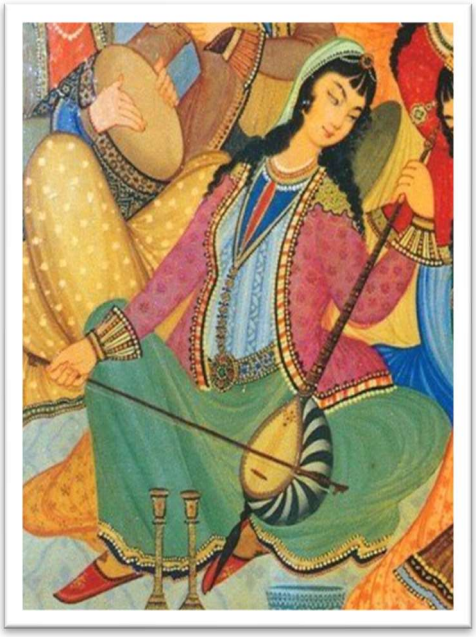


Mirzə Qədim İrəvani (1825-1879) və Mir Möhsün Nəvvab (1838-1918) kimi böyük sənətkarların yaradıcılığı bu parçalanmadan sonrakı dövrə təsadüf edir. Mirzə Qədim İrəvanda yaşamış və İrəvan sərdarının sarayının divarlarını rəngarəng rəsmlərlə bəzəmişdir. Onun bir sıra portretləri işlənmiş rəng-lərin təmizliyi və parlaqlığı ilə elə ilk baxışdan diqqəti cəlb edir. Naxçıvan şəhərində doğulmuş Bəhruz Kəngərli (1892-1922) peşəkar rəssamlıq təhsili almış ilk azərbaycanlı rəssamdır. Onun yaradıcılıq potensialının formalaş-masında Tiflisin mədəni mühiti böyük rol oynamışdır. Vaxtsız ölüm gənc rəssamı həyatının və yaradıcılığının çiçəkləndiyi bir vaxtda haqlasa da, o, bir sıra gözəl mənzərələr və eləcə də Ermənistandan və Naxçıvandan qovulmuş qaçqın qadınlar-ın, qoca və uşaqların təsiredici portretlərini çəkməyə macal tapmışdır.

Əvvəllər mədəniyyətin inkişaf səviyyəsinə görə ərəblər əsarət altına alınmış xalqların əksəriyyətindən çox-çox aşağıda dururdular. Lakin ərəblər yavaş-yavaş bu xalqların elm və incəsənət sahəsindəki nailiyyətlərini mənimsədilər. Yeni təşkil edilmiş Ərəb xilafətinin sərhədi Hind okeanından başlayıb Atlantik okeanına qədər uzanırdı. Təbiidir ki, fəth etdikləri bu ərazilərdə ərəblər islam mədəniyyəti, islam estetikasını da yaradırlar. Bu yeni mədəniyyətin yerli xalqlar mədəniyyəti ilə sintezi parlaq sənət abidələrinin yaranmasına səbəb olurdu. Bəli, bu zaman

canlı təsvirlərin sayı məhdudlaşır, əvəzində isə incəsənətdə həndəsi və nəbati ornamentlər, mürəkkəb naxış kompozisiyaları geniş yayılıb sürətlə inkişaf etməyə başlayır. Ərəb xilafətinə daxil olan xalqların hamısının sənəti üçün ümumi bir mühüm cəhət var, o da dindir; daha doğrusu, islam dünyagörüşü, islam estetikasıdır. Lakin bir estetikanın, bir vahid sistemin təsir dairəsində yaranmalarına baxmayaraq, məsələn, İraq sənətini Misir sənətindən, ispan islam mədəniyyətini isə onların hər ikisindən asanlıqla ayırmaq olur. İslam memarlığında dini təyinatlı tikililər: yəni məscidlər və mədrəsələr, xanəgahlar və s. əsas yer tuturdu. Bunlardan savayı, əlbəttə, saraylar, karvansara-lar, türbələr və yaşayış binaları kimi mülki memarlıq obyektləri də tikilirdi. İran xalqı çox qədim və zəngin bi mədəniyyət tarixinə malikdir. İran ərazisində tapılmış ən qədim sənət nmunələri bizim eradan əvvəl 3-cü minilliyə aiddir. Qaya-larda yonulmuş müxtəlif heykəllər, rəsmlər bu ərazidə yaşayan xalqların uzaq keç-mişi haqqında çox şey deyir. Əhəmənilər dövrü (e.ə. VI-IV əsrlər) Qədim İran mədəniyyətinin olduqca maraqlı və zəngin bir mərhələsi hesab olunur.

Bu günə kimi qalmış şəhər qalıqları, müxtəlif saray və məzarlar Əhəmənilər dövründə İranda böyük bir mədəniyyət olduğunu əyani şəkildə isbat edir. Xüsusilə yunanların Persepol (Fars şəhəri- yunş) adlandırdıqları paytaxt şəhəri Təxt-i Cəmşiddəki arxeoloji qazıntılar zamanı tapılmış incəsənət nümunələri yüksək sənətkarlığı ilə insanı heyran edir. Makedoniyalı İsgəndərin həmin şəhəri alması və onun yandırılması İran tarixinin ən faciəvi epizodlarından biridir. Tarixdən bəllidir ki, o, şəhərin saysız-hesabız sərvətlərini üç min dəvə və on min atla daşıtdırıb aparmışdır. Qisas məqsədilə gəlmiş Makedoni-yalı İsgəndər bu nəhəng şəhəri tamamilə dağıdıb xarabazara çevirmişdir(e.ə.IV əsr). İran incəsənətinin sonrakı yeni yüksəlişi Sasani sülaləsinin hökmranlığı dövrü ilə bağlıdır (226-636). Sasani mərhələsində yaradılmış memarlıq abidələri, qaya heykəlləri, müxtəlif tətbiqi sənət nümunələri, xüsusilə qızıl, gümüş və bürüncdən düzəldilmiş bəzəkli qab-qacaq İran incəsənətində mühüm yer tutur. Türkiyə incəsənəti iki əsas mərhələyə bölünür: Səlcuq dövrü (XI-XIII əsrin ortaları) və Osmanlı türklərinin dövlət yaratdığı dövr (XIV əsrin əvvəli-XX əsrin əvvəlinə kimi). XI əsrdə Səlcuq türkləri nəhəng bir dövlət yaradırlar. Bu dövlətin paytaxtı Konya şəhəri olduğuna görə onu Konya Səltənəti adlandırırlar(1077-1307) Səlcuq dövrü incəsənətinin çiçəklənmə dövrünə gəlincə isə bu, Soltanələddin Key-Qubadın (1219-1236) hökmralığı illərinə təsadüf edir. O zaman Türkiyədə çoxlu yaşayış məskənləri, o cümlədənə Alayə və Qubadiyə şəhərləri salınmış, memarlıq baxımından maraqlı məscidlər və karvansaralar tikilmişdir. 1251-ci ildə Konyoda inşa edilmiş İncə- Minarəli məscid o düvrün ən maraqlı abidələrindəndir.



İstanbulda həmçinin soltanların iqamətgahı Topqapı saray kompleksi, Çinili köşk və başqa yaşayış binaları inşa olunur. O zaman Türkiyədə çoxlu yaşayış məskənləri, o cümlədənə Alayə və Qubadiyə şəhərləri salınmış, memarlıq baxımından maraqlı məscidlər və karvansaralar tikilmişdir. 1251-ci ildə Konyoda inşa edilmiş İncə-Minarəli məscid o düvrün ən maraqlı abidələrindəndir. Bu məs-cidin əsas giriş qapısı gözəl oyma naxışlar və yazılarla bəzədilmişdir.

İstanbulda həmçinin soltanların iqamətgahı Topqapı saray kompleksi, Çinili köşk və başqa yaşayış binaları inşa olunur.

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Veterinary Sciences

TRICHINELLA NATIVA ALTERNATIVE GENES FOR EARLY SPECIFIC DIAGNOSTIC OF TRICHINELLOSIS

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Trichinellosis is a zoonotic parasitic disease, the main causative agent in wild animals of which are the larvae of *Trichinella nativa*, the sources of invasion may be the consumption of insufficiently heat–treated meat [1]. Trichinellosis has no obvious distinctive clinical manifestations. Therefore, muscle biopsy is the gold standard for the diagnosis of trichinellosis, but this method is invasive and does not detect the early stage of infection, which takes place in the intestine. Serodiagnostics can detect the disease after 2-3 weeks. At the same time, antibodies to the disease are detected up to 19 years after the acute phase of infection [2].

To improve the diagnosis of trichinellosis, additional diagnostic biomarkers must be identified. It is also important to identify the type of parasite, since the intensity of invasion and the rate of development of larvae in different species differ. Thus, early studies have shown that the duration of the intestinal phase in *T. nativa* lasts up to 21st days after invasion (dpi) days, when, as in the *T. spiralis* species, muscle invasion begins on 14 dpi [3]. Early diagnosis is critically important for timely treatment and prevention of complications, but traditional serological methods often face the problem of insufficient sensitivity and specificity, which leads to errors in diagnosis. In this context, the development of recombinant *Trichinella spp* antigens is becoming a promising area, providing higher diagnostic accuracy and the possibility of mass production. Recombinant antigens not only increase the sensitivity and specificity of tests, but can also contribute to the development of effective therapeutic agents, opening up new possibilities for combating trichinellosis [1, 2].

The study was conducted in the period 2024 on the basis of the Scientific and Production Platform of Agricultural Biotechnology of the S.Seifullin Kazakh Agrotechnical Research University. In our study, we analyzed the nucleotide sequence of genes that may be candidates for early

diagnosis of the disease and developed specific primers for their identification. The BLAST and MEGA 11 programs were used for bioinformatic analysis.

One of the most promising genes that is currently being actively studied is aminopeptidase (AP). In particular, *T. spiralis* aminopeptidase has been identified among the proteases produced by larvae in the intestinal phase and the excretory-secretory product. Aminopeptidase is a set of peptidases that catalyze the hydrolysis of residues from the amino terminal of peptides and proteins. They can perform important physiological functions such as degradation of peptides and host proteins, modulation of gene expression, antigen processing and protection [5]. In the research of Thawornkuno C. et al. the high immune activity of aminopeptidases during immunization has been shown, which makes it possible to use this protein as a vaccine component [2].

Also, one of the possible proteins for early diagnosis may be the long-chain fatty acid transporter protein 1 (FATP1). This protein is a member of the fatty acid transporter family. It provides transmembrane transport of fatty acids and participates in lipid metabolism. Lipids are the most important components of cell membranes and organelles of *Trichinella spp*. Research by Li Y.L. et al. it is shown that TsFATP1 is highly expressed in the intestinal stages of *T. spiralis*, mainly localized in the cuticle, stichosome and intrauterine embryos of the parasite. At the same time, the suppression of the synthesis of this protein disrupts the synthesis of many components of the larvae, which leads to a violation in their development [5].

Based on the recorded sequences in the NCBI database, the AP and FATP1 genes were analyzed and primers were designed to detect them in *T. nativa* larvae (Figure 1-2).

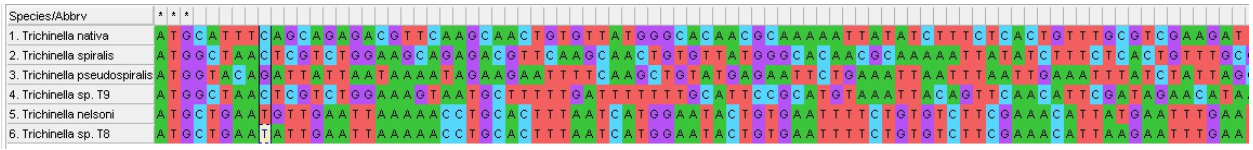

Figure 1. Trichinella nativa aminopeptidase gene nucleotide sequence (NCBI data base)

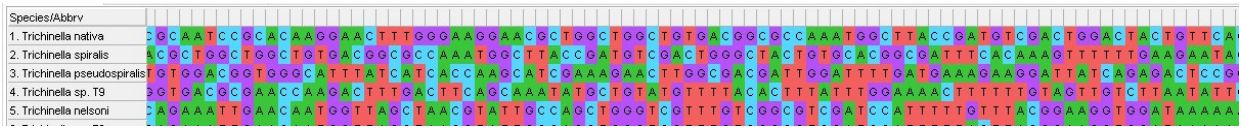

Figure 2. Trichinella nativa Long-chain fatty acid transport protein 1gene nucleotide sequence (NCBI data base)

According to the analysis, the most conservative gene regions were selected and primers were designed for further sequencing of *T. nativa* genes:

Aminopeptidase:

Tr.n.AP.FG_F: CCTAGTAGCGTTCGTCGCAT

Tr.n.AP.FG_R: GCAAATTTGATCCACCGCGT

With a primer annealing temperature of 56℃ and a product length of 1494 bp.

FATP1:

T.n.FATP1_PrF : CGTCATGGGTTGATTGTTTT

T.n.FATP1_PrR: GTCTTTGTACTTCAGTGCGTCA

With a primer annealing temperature of 58℃ and a product length of 1920 bp.

Thus, a bioinformatic analysis of candidate genes for the early diagnosis of trichinellosis AR and FATP1 was carried out. An analysis of the literature and an analysis of the nucleotide sequence showed that only the full-genome sequence of *T. nativa* was registered in the NCBI database, while no detailed study of the AP and FATP1 proteins for this type of parasite was conducted. Studies of alternative genes of *T. nativa* allow to expand knowledge about this type of parasite, which is

widespread in Kazakhstan and among wild animals around the world. Specific antigens allow for species identification in the early stages of infection.

This research was conducted within the framework of the topic of the scientific project No. AP23489156 “Determination of alternative genes of immunospecific proteins of *Trichinella nativa* for the development of latex diagnosticum” funded by the Ministry of Science and Higher Education of the Republic of Kazakhstan.

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CIRCULATION OF THE IBR VIRUS IN THE SOUTH OF KAZAKHSTAN

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Introduction. Infectious bovine rhinotracheitis (IBR) is an acute, highly contagious disease caused by the bovine herpes virus (Bovine Herpesvirus-1, BoHV-1). It is widespread all over the world and causes significant economic damage due to a decrease in animal productivity. In Kazakhstan, cattle are also affected by the IBR virus, especially in the south, where a large number of cattle have been registered.

Materials and methods of research. The research was conducted within the framework of the scientific and technical programme individual registration number BR218004/0223 «Improving biosafety measures in Kazakhstan: countering dangerous and especially dangerous infections» for 2023-2025. In 2021, 855 blood serums were selected from Almaty, Zhambyl, and Turkestan regions for analysis. There are also 855 blood serums in 2022 year and 750 blood serums in 2023 year. Blood serums were examined by the ELISA method, a test system produced by IDEXX. The WHO recommends ELISA as the most acceptable and effective method for detecting antibodies to the IBR virus.

Results. Results of the research are clearly shown in the table below:

Results of ELISA in 2021-2023 years

Name of the region	2021		2022		2023	
	Total number of samples	Number of positive samples	Total number of samples	Number of positive samples	Total number of samples	Number of positive samples
Almaty	285	167	285	180	180	32
Zhambyl	285	198	285	233	285	170
Turkestan	285	211	285	275	285	202

As shown in the table above, seropositive animals were found in all areas of the south. The average seroprevalence for 2021 year was 67.36%, for 2022 year was 80.52%, for 2023 year was 52.64%. The Turkestan region shows the highest seroprevalence in all 3 years. Thus, the circulation of IBR virus is observed in all southern regions of Kazakhstan.

Geographic Sciences

«Метеорология және климатология негіздері». Арнайы курсының маңыздылығы

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Аңдатпа. Бұл бағдарламада оқушыларды теориялық және практикалық қырларын ұштастырып, ғылыми-зерттеу жұмысына мектеп қабырғасынан жаппай баулу арнайы курстың негізгі мақсаты болып табылады. Курс барысында оқушылар әртүрлі метеорологиялық географиялық жүйенің дамуы мен жағдайын анықтайтын табиғи ерекшеліктер мен процестерді, геожүйедегі энергия және зат алмасу процестерін, су және жылу балансындағы өзгерістерді зерттейді, табиғатты қорғаудың өзекті мәселелерін қарастырады, климаттың өзгеруінің себептерін анықтап, оларға өз көзқарасы тұрғысынан баға беруді үйренеді.

Түйін сөздер: география, метеорология, климатология, қоршаған орта

Кіріспе. Метеорологиялық іс-тәжірбиеде «ауа-райы» және «климат» деген ғылыми терминдер кеңінен қолданылады, себебі олардың екеуі де атмасфераның белгілі бір күйіне жатады. Ауа-райы қысқа уақыт аралығындағы немесе тәулік ішіндегі атмасфераның күйі болып саналса, ал климат ұзақ уақыт ішіндегі құбылыстардың жиынтығы. Ал, «тәулік» дегеніміз атмасфера күйінің заңды өзгерістерінің ең қысқа табиғи кезеңі . Бұл өзгерістерді ауа-райы элементтердің, яғни ауа t мен ылғалдылықтарының, бұлттылықтың, жер-шарының, атмасфера қысымының, желдің тәуліктік жүрісін бақылай отырып, қадағалауға болады. Атмасфераның күйін негізгі метеорологиялық элементтердің кешендік жиындығымен сипаттайды. Кешендік жиындық дегеніміз: атмосферадағы барлық құбылыстардың болып отыруы. Сондықтан ауа-райын жүйелі түрде бақылап, зерттеу арқылы тәуліктік ауа-райының кешендік типтерін бөлуге болады. Атап, айтсақ ауа t-сына байланысты ауа-райы үлкен үш топқа бөлінеді: аязды ауа-райы; 0^0- тағы ауыспалы ауа-райы; аязсыз бұл топтардың әрбірінде ауа-райы бірнеше кластарға бөлінеді. Осы жайында курс барысында қарастырылатын болады.

Талқылау және нәтижелер. Қазіргі таңдағы білім беру жүйесінің біраз өзгешеленіп, заман талабына сай жасалынып жатқандығы ұстаздарға біраз жауапкершілік жүктейді, оқушылардың өз бетінше жұмыс жасау тәжірибесін қалыптастыруда жаңа міндеттер қояды. Білім беру жүйесінде жас ұрпақты жан-жақты дамыту мен тәрбиелеуде, олардың жалпы мәдениетін қалыптастыруда, зерттеу жұмыстарына баулуда, табиғат пен қоғам алдындағы жауапкершілігін сезіндіруде география пәнінің ролі өте зор.

География – мектептегі білім беру үдерісінің маңызды бір бөлігі, өйткені қоғам мен адамның тыныс-тіршілігі қоршаған ортамен, географиялық кеңістікпен тығыз байланысты. Жас ұрпақтың географиялық сауаттылығы мен географиялық мәдениетін көтеруде пәнге бөлінген сағатта толыққанды жүзеге асыру қиындық туғызады. География пәнінің оқу бағдарламасында саламандық жұмыстарға арнайы сағат бөлінуіне қарамастан бұл

жұмыстардың мазмұндық құрылымы теориялық тапсырмаларды орындаумен, картамен жұмыс жасаумен ғана шектеледі. Бүгінгі күні мектеп оқушыларының ғылыми жұмыспен айналасуы жеке сипатқа ие болып отыр. Мұғалім жұмыстың ауқымдылығына байланысты белгілі бір тақырып бойынша санаулы оқушымен ғана ғылыми жоба аясында жұмыс жүргізе алады. Алайда оқушы оқу процесінің басты өзегі десек, назардың барлығын әр оқушының дамуына, оның ойлауының еркіндігіне аудару маңызды деп білемін.

Әр уақытта ғылым іс жүзінде прогрестің қозғаушы күшіне айналуы үшін ол тек теориялық тұрғыдан ғана қарастырылмай, өндірісте практикалық тұрғыда көрініс табуы тиіс. Кез келген ғылыми білімнің негізі мектептен бастау алады дейтін болсам, оқушыларды ғылыми зерттеу жолында өз бетінше іздену, алған білімін күнделікті өмірде пайдалану, шығармашылық қабілетін жан-жақты дамыту мақсатында білім беру саласындағы оқыту әдістемелерін жаңғырту жұмысы басшылыққа алынып отырғаны мәлім. Осы тұрғыда 7-сыныпқа арналған «Метеорология және климатология негіздері» арнайы курс бағдарламасы оқушылардың теориялық және практикалық қырларын ұштастырып, ғылыми-зерттеу жұмысына жаппай баулуға бағытталатынын айта кеткенді жөн санаймын.

Арнайы курс бағдарламасының мазмұнында теориялық және практикалық түрде оқыту негізінде оқушылардың санасында атмосфера және атмосфералық құбылыстар туралы ұғым қалыптастырылып, жер беті мен атмосфера қабатының өзара байланысы мен әсерін және географиялық факторларға байланысты күн сәулесінің түсу ерекшеліктерін анықтау жүзеге асырылады. Бағдарламаның негізгі мақсаты – атмосфералық құбылыстарды оқып, зерттеумен қатар, халық шаруашылығы үшін қолайсыз болып есептелетін климат пен ауа-райын алдын ала болжап, оны болдырмаудың шараларын зерттеуге ынталандыру, сондай-ақ, оқушылардың қоршаған ортаға деген қамқорлық пен сүйіспеншіліктерін қалыптасуына ықпал ету болып табылады

Курс барысында оқушылар әртүрлі метеорологиялық географиялық жүйенің дамуы мен жағдайын анықтайтын табиғи ерекшеліктер мен процестерді, геожүйедегі энергия және зат алмасу процестерін, су және жылу балансындағы өзгерістерді зерттейді, табиғатты қорғаудың өзекті мәселелерін қарастырады, климаттың өзгеруінің себептерін анықтап,оларға өз көзқарасы тұрғысынан баға беруді үйренеді.

Курсты таңдаған оқушылар (адам санына байланысты анықталады) жұптарға немесе 3-4 адамнан шағын топтарға бірігіп күнделікті мектеп маңында метеорологиялық бақылау жұмысын жүргізеді, жиналған мәліметтерді арнайы ауа райы күнделіктеріне тіркейді. Сонымен қатар, «Қазгидромет» ұсынған метеорологиялық элементтеді де тіркеп жинақтайды. Бағдарлама аясында бөлінген 1 апталық сағатта оқушылармен күнтізбелік жоспарға сәйкес теориялық және практикалық сабақтар ұйымдастырумен ғана шектелмей, мектепішілік үлкен ғылыми қоғамдастықтың қалыптасуына да септігі тиіп отыр. «Метеорология және климатология негіздері» арнайы курсын меңгерген оқушы географиялық және синоптикалық карта, атластармен жұмыс жүргізе отырып, қазіргі атмосфералық процестердің өзгерісі мен дамуын біле отыра, климат қалыптастырушы факторларды анықтай алуға, атмосфераның ластануына баға беріп, оны алдын алу жолдарын қарастыруды үйренеді.

Осы жолда іс-тәжірибемде жеке оқушымен, топпен жұмыс, барлық оқушымен жұмыс түрлерін қолданып келемін. Оқушының өзіндік ізденісі кезінде белгілі тақырып бойынша түсіндірмелі оқу, жоспар жасату, мәтін ішіндегі ең негізгісін табуға, мәтін мазмұны бойынша кесте, диаграмма жасау, мәтін мазмұны бойынша салыстыруға түрлі сурет бойынша жұмыс түрлері, сызбанұсқаларға талдау, картамен жұмыс, сөздік жұмысы, терминдермен жұмыс, өтілген тақырыпқа қорытынды жұмыстар жасау т.б орындатылады.

Бүгінгі күні атқарылған оқу іс-әрекеттерінің нәтижесінде оқушылардың ғылыми зерттеу жұмысына қызығушылықтары қалыптасты, ғылыми-практикалық конференциялар мен

ғылыми жобалар сайысында жақсы нәтиже көрсетіп келеді. №9 «Зерде» мамандандырылған лицейінде география ғылымдарының докторы, Л.Н. Гумилев атындағы ЕҰУ-нің Туризм кафедрасының профессоры О.Б. Мазбаевтың жетекшілігімен оқушыларым өлкетану бағытында шығармашылықпен ізденіп, ғылыми жұмыстар жасауға қалыптасты. Атап айтсам: «Астана қаласына жақын елді-мекендердің экологиялық-әлеуметтік мәселелері», «Астана қаласының маңындағы көлдердің гео-экологиялық жағдайы», «Есіл өзенін абаттандыру», «Астана қаласының саябақтарының табиғи экологиялық жағдайлары», «Қазақстан республикасының территориясындағы емдік өсімдіктер географиясы», «Астана қаласындағы Ақбұлақ өзенінің мәселесі» тақырыптарында жобалар жазып, қалалық ғылыми жоба жарыстарының жеңімпаздары болды.

Қорытынды. Бұл авторлық курс, география оқу бағдарламасында саламандық жұмыстарға арнайы сағат бөлінуіне қарамастан бұл жұмыстардың мазмұндық құрылымы теориялық тапсырмаларды орындаумен, картамен жұмыс жасаумен ғана шектеледі. Мектеп маңы метерологиялық алаңның жұмысына оқушыларды күнделікті тікелей қатыстырып, ауа райына тұрақты жыл бойы бақылау жұмысын ұйымдастыруы, бұл бағыттағы ғылыми зерттеу жұмысын жүзеге асыру дәстүрлі арнайы курстардың теориялық жағынан практикалық тұрғысына баса назар аударуы жаңашылдыққа ие болып отыр. Арнайы курс аясында тұтастай метеорологиялық бақылау жұмысын ғылыми сипатта ұйымдастыру формасының өзі жаңашыл болып отыр. Білім-барлық уақытта жоғары құндылықтардың бірі болған. Тек білімді, сауатты адам ғана келешек тізгінін қолына ала алады. Сынып оқушыларының жас ерекшеліктерін ескере отырып метерологиялық бақылауға негізделген ғылыми зерттеу жұмысы тұрақты қызығушылықты қамтамасыз ету арқылы, өз елінің экономикалық-әлеуметтік әлеуетінің артуына зор үлесін қоса алатын адами-зияткерлік капиталы жоғары өскелен ұрпақты қалыптастыруда оң нәтиже беретіні анық. Білім жолында бәсекеге қабілетті бала, өмірде де бәсекеге қабілетті бола алады.

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İnkişafa təsir edən ekoloji, iqtisadi, sosial və siyasi amillər – dünyanın müxtəlif hissələri arasında ticarətin qlobal balanssızlığı

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Açar sözlər: Təbii sərvətlərin təsiri, qlobal iqtisadiyyat, kasıb ölkələr, zəngin ölkələr, dünya ticarət sistemi, sosial amillər

İnkişafa təsir edən ekoloji amillər- təbii təhlükələrin təsiri.

Fiziki mühit bir yerin inkişafına birbaşa təsir göstərə bilər. Böyük Britaniya sənaye inqilabı zamanı qlobal super gücə yüksəlməsi üçün fiziki və ya təbii mühitindən bir çox cəhətdən faydalandı. Ada təbiəti ona resurslardan və bir çox potensial ticarət yollarından tam istifadə etmək üçün sahil xətti verdi. Kömür, dəmir filizi və əhəngdaşı da daxil olmaqla bir çox sənaye prosesləri üçün istifadə etmək üçün təbii ehtiyatların düzgün qarışığına malik idi. Həm də inkişafa zərər verə biləcək ekstremal hava şəraiti olmayan mülayim bir iqlimə sahib idi. Bir çox ölkələr o qədər də şanslı deyil və aşağıdakı amillər inkişafı məhdudlaşdıra bilər;

1. İqlimlə bağlı xəstəlik – bir çox tropik ölkələr təəssüf ki, Dengue Fever, Chagas Disease və Malyariya kimi isti rütubətli şəraitdə inkişaf edən xəstəliklərdən əziyyət çəkirlər. Bu xəstəliklərə yoluxan insanlar əlil olurlar və işləyə bilmirlər və ya hətta ölə bilərlər ki, bu da inkişafı məhdudlaşdırır.

2. Təbii sərvətlərin çatışmazlığı – təbii ehtiyatları az olan ölkələr çox aşağı iqtisadi bazadan başlayırlar və dünya bazarlarında satıla bilən məhsullar yaratmaqda çətinlik çəkirlər.

3. Təbii sərvətlərin lənətlənməsi nəzəriyyəsi – bu, bir ölkənin çox qiymətli bir resursa malik olub-olmadığını, ölkənin bütün səylərinin həmin resursun istismarına sərf edildiyini bildirən bir nəzəriyyədir. Bu, digər sənaye sahələrinin POTENSİAL inkişafını məhdudlaşdırır və əgər resurs azlıqda olan vicdansız hakim elitanın əlindədirsə, mənfəət ölkədəki insanlar arasında yaxşı bölüşdürülmür.

4. Pis qonşularla dənizə çıxışı olmayan - bunun siyasi elementi olsa da, dənizə çıxışı olmayan ölkələr qonşularının mərhəmətindədir. Əgər onlar böyük ödənişlər gözləyən və ya müntəzəm qarşıdurma yaşayan "pis qonşular"dırsa, bu, inkişafı ciddi şəkildə məhdudlaşdıra bilər.

5. Qasırğalar və quraqlıq kimi iqlim təhlükələri- bəzi ölkələri digərlərinə nisbətən daha çox vurur. Kövrək ölkələr üçün quraqlıq inkişafa dağıdıcı təsir göstərə bilər. Efiopiya, Eritreya, Keniya və Somaliyə təsir edən 2011-2012-ci illərdə Afrika Buynuzu qıtlığının uzunmüddətli təsiri oldu. İnsanları aclıq və susuzluqdan öldürmək və zəiflətməklə yanaşı, bu ölkələrin bir çoxu qaçqın böhranı ilə mübarizə aparmalı, qiymətli resursları digər inkişaf məqsədlərindən yayındırmalı oldu. Təəssüf ki, yoxsulluq yoxsulluğa səbəb ola bilər. Diaqram tez-tez bir dövr kimi düşünülən yoxsulluq tələsini göstərir. İnfrastruktur (yollar, dəmir yolu, telekommunikasiya və s.), təhsil və səhiyyə kimi əsas sahələrə aşağı investisiya qoyulması əhali üçün dəhşətli nəticələrə səbəb ola bilər. Aşağı inkişaf səviyyəsinə malik olan ölkələrdəki əhali xəstəliyə qarşı daha həssas ola bilər (Saxaradan cənubda Afrikada HİV və QİÇS ilə müşahidə etdiyimiz kimi) bu da işçi qüvvəsinin məhsuldarlığını azaldır. Bundan əlavə, təhsilin olmaması daha aşağı keyfiyyətli işçi qüvvəsinə gətirib çıxarır və zəif yol şəbəkələri kənar investorlar üçün cəlbedici deyil. Bu kimi sadə şeylər yoxsulluğu kəskinləşdirə (daha da pisləşdirə) və ölkələri aşağı inkişaf səviyyəsində bataqlığa sala bilər.

Xüsusilə bugünkü çox rəqabətli qlobal iqtisadiyyatda çox aşağı bazadan genişlənmək çox çətindir. Bundan əlavə, iqtisadi inkişaf səviyyəsi aşağı olan ölkələrin də vətəndaş müharibələrinin və onların sonrakı nəticələrinin qurbanı olma ehtimalı daha yüksəkdir. Sudan, Konqo Demokratik Respublikası və Ruanda kimi ölkələr buna yaxşı nümunədir. Müharibələr həyati əhəmiyyətli resursları istehlak edir və diqqəti normal insanlar, səhiyyə, etibarlı ərzaq təchizatı, sabitlik, iqtisadi rifah və təmiz içməli suya çıxış üçün vacib məsələlərdən yayındırır.

Dünyanın ən kasıb ölkələri də dünyanın ən zəngin ölkələri tərəfindən hazırlanmış və idarə olunan qlobal ticarət sisteminin mərhəmətinə məruz qalmışdır. Dünyanın ən zəngin ölkələri tərəfindən həyata keçirilən bir sıra tədbirlər dünyanın ən yoxsul ölkələrinin əlverişsiz vəziyyətdə olması deməkdir;

1. Kasıb ölkələrdən malların idxal tarifləri həmin malların qiymətlərini yuxarı qaldırır.

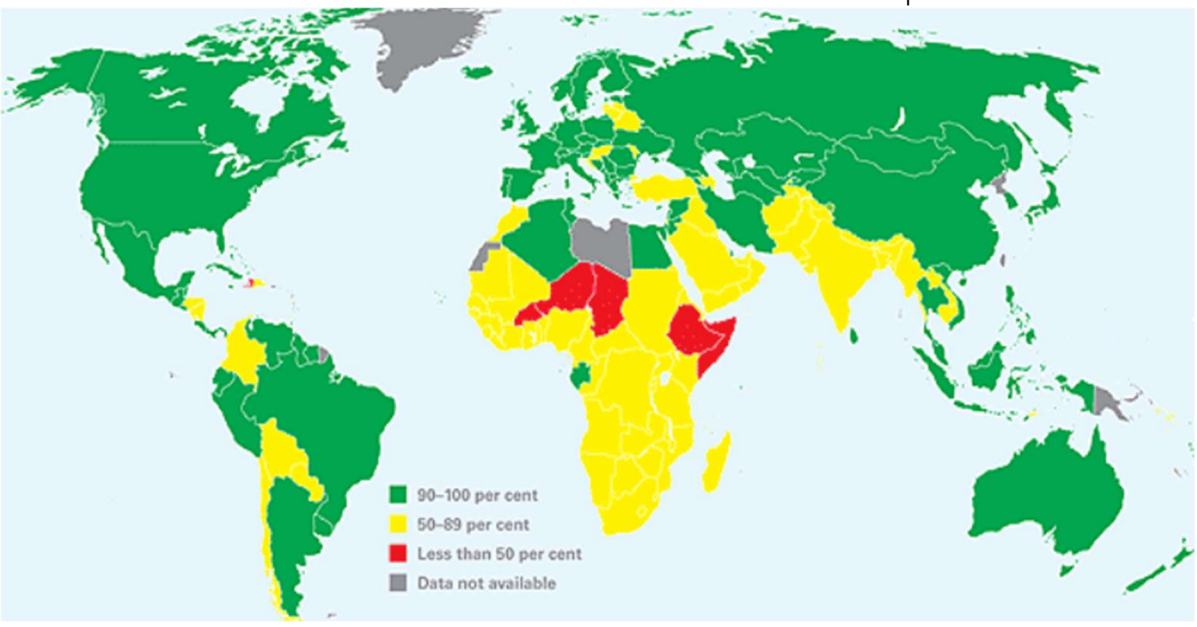
2. Zəngin ölkələrdə istehsal olunan mallara verilən subsidiyalar (hökumətlərdən istehsalçıya ödənişlər) zəngin dünya mallarının qiymətlərini ucuzlaşdırır. Bu, yoxsul ölkələrin rəqabətini çətinləşdirir.

3. Dünya ticarət sistemi "aşağıya doğru yarışı" təşviq edir, burada daha zəngin ölkələrdən olan alıcılar dünya üzrə bir yerdən digər yerə gedib qiymətləri aşağı salır, çünki malların təklifi çox vaxt tələbi üstələyir.

Bundan əlavə, etibarlı enerji təchizatının, siyasi sabitliyin, infrastrukturun və təhsilli işçi qüvvəsinin olmaması ölkələri əlverişsiz vəziyyətə salır. Bir çox yoxsul ölkələrdə xalis nəticə ondan ibarətdir ki, onlar kənd təsərrüfatı məhsulları kimi yalnız aşağı dəyərli xammalı ixrac etmək məcburiyyətində qalırlar, eyni zamanda daha bahalı istehsal olunan malları və ya xidmətləri geri alırlar. Kasıb ölkələrin bu tip sənayeləri qurmaq üçün kapitalı yoxdur.

Sosial amillər Bir yerin inkişaf səviyyəsinə təsir edə biləcək bir çox sosial amillər var. İnkişaf üçün sosial motivasiyanın olmaması, müharibə və ya çox böyük ailənin olması kimi qeyri-məhsuldar sosial funksiyalar, qumar və içki kimi mənfi sosial mədəniyyətlər və zəif təlim və təhsil səbəbindən bacarıqların olmaması bu amillərdən bəziləridir. Təhsil xüsusilə vacibdir, çünki bir çox ölkələr bütün uşaqları hətta ibtidai səviyyədə məktəbə göndərə bilmirlər. UNICEF iddia edir ki, 2006-cı ildə 93 milyon ibtidai məktəb yaşlı uşaq məktəbə getmirdi!

İbtidai məktəbə qəbulun xəritəsi



SU TƏMİNATI və KEYFİYYƏT- Suyun keyfiyyəti insanlara böyük təsir göstərə bilər və bu, Hindistan və onun Qanq çayını təmizləmə cəhdləri ilə əlaqələndirilir. Suyun keyfiyyətinin aşağı olması insanların həyatına birbaşa təsir göstərir, çünki bu, yaşayış üçün vacib elementdir. Suyun keyfiyyətinin aşağı olması xəstəliklərə gətirib çıxara bilər ki, bu da insanları zəiflədir və buna görə də onların məhsuldarlığına və deməli, iqtisadi inkişafına birbaşa təsir göstərir. Keyfiyyətsiz su ilə əlaqəli xəstəliklərə Bilharzia (ilbizlərin daxili orqanların zədələnməsinə səbəb olan insanlara yastı qurdlar ötürdüyü ilbiz qızdırması), Sarı qızdırma və Malyariya (hər ikisi su ətrafında böyüyən ağcaqanadlarla əlaqəli) və vəba (həddindən artıq ishal) daxildir. Su təchizatı digər mühüm məsələdir, çünki dünyanın bir çox yerlərində etibarsız su təchizatı kənd təsərrüfatını və digər inkişaf sahələrini məhdudlaşdırır. İnsanlar su axtarırlarsa və su daşıyırlarsa, enerjilərini iqtisadiyyatın başqa sahələrinə yönəldə bilmirlər, bu da inkişafı daha da məhdudlaşdırır. WaterAid-ə görə;

· Hər il 700 000-ə yaxın uşaq təhlükəli su və pis sanitar şəraitin yaratdığı ishaldan ölür. Bu, gündə təxminən 2000 uşaq deməkdir.

· Dünyada 768 milyon insanın təhlükəsiz suya çıxışı yoxdur. Bu, təxminən dünya əhalisinin hər on nəfərindən biridir.

· 2,5 milyard insan, dünya əhalisinin demək olar ki, beşdə ikisini təşkil edən adekvat sanitar şəraitə çıxışı yoxdur.

SİYASİ FAKTORLAR- Qeyri-sabit hökumətlərin təsiri.

Hökumətlər inkişaf prosesində aparıcı rol oynayır və bir çox hökumətlər orada yaşayan insanların həm həyat səviyyəsini, həm də həyat keyfiyyətini yüksəltməyə çalışan yaxşı iş görən vicdanlı insanlarla doludur. Təəssüflər olsun ki, elə hökumətlər var ki, onların təmsil etməli olduqları insanların hesabına pul və sərvət qazanan korrupsioner məmurlar var. BBC Nigeriyanı Yer planetinin ən korrupsiyalaşmış ölkələrindən biri kimi qeyd edib. Siyasətçilər korrupsiyaya uğrayanda səhiyyə, təhsil, yollar, enerji istehsalı və təmiz su sahələrində inkişaflar daha az olur. Şirkətlər və digər hökumətlər də qeyri-sabit olduqları üçün həmin ölkələrə sərmayə yatırmaq ehtimalı azdır. Hətta ÜDM ilə kifayət qədər yaxşı əlaqəli olan bir korrupsiya qavrama indeksi də var.

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Architecture

УДК 551.51

ФИЗИЧЕСКИЙ ЗАКОН БЕРНУЛЛИ В РЕШЕНИИ ПРОБЛЕМ С ЗАГРЯЗНЕНИЕМ ВОЗДУХА В ГОРОДАХ

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Аннотация: *В статье рассматриваются физические законы движения воздушных масс, применимые для очистки воздушного бассейна городов. "Конус Бернулли" является эффективным средством для очистки воздушного бассейна городов от смога. Он вызывает принудительное горизонтальное и вертикальное движение воздушных масс, способен пробить инверсионный слой и увести загрязненный воздух за пределы города даже при абсолютном безветрии на земной поверхности.Эффект Бернулли позволяет втянуть в полость конусного устройства загрязненный воздух и вывести его за пределы инверсионного слоя, где он будет разноситься более сильными потоками ветра.*
Ключевые слова: *физика атмосферы, циркуляция воздушных потоков, очистка воздушного бассейн, закон Бернулли.*

Введение.

Широко известен закон Бернулли швейцарского физика, механика и математика Д.Бернулли – один из создателей кинетической теории газов, гидродинамики и математической физики [1].Эффект Бернулли – это явление, которое проявляется во многих областях нашей жизни, в том числе и в архитектуре. Он заключается в изменении давления воздуха в зависимости от его скорости движения. В архитектуре эффект Бернулли может использоваться для создания эффективной вентиляции зданий, а также для обеспечения

комфортной температуры внутри помещений. В данной статье мы рассмотрим, как работает эффект Бернулли в архитектуре и как его можно применять для очистки воздушгого бассейна городов от смога.

В последние десятилетия городской смог стал одной из главных экологических проблем, с которыми сталкиваются крупные города по всему миру. В связи с этим, растет важность аэрации городских пространств как ключевого фактора в борьбе с загрязнением воздуха и улучшении качества жизни горожан. Современные архитектурные решения, интегрирующие инновационные подходы к организации воздушных потоков, становятся основными средствами реализации концепции устойчивого развития городской среды. В данной статье мы рассматриваем роль аэрации в борьбе со смогом и обсуждаем потенциал современных архитектурных стратегий для повышения уровня городской вентиляции и снижения негативных последствий атмосферного загрязнения.

Закон Бернули гласит: чем выше скорость, тем ниже давление, чем меньше площадь сечения, тем больше скорость. На этой разнице скоростей ветра и создан ряд предложений для очистки воздушного бассейна г. Алматы, например установка "Конус Бернулли".

Метод исследования.

- эмпирическиеметоды исследования - это изучение разных источников информации, сбор информации, анализ полученных сведений, на основе которых был осуществлён выбор подходящих подходов для решения поставленных проблем;
- теоретическиеметоды исследования:анализ, синтез, моделирование, классификация, аналогия, дедукция-индукция, которые помогли разработать модели, решающие проблемы аэрации воздушной среды города;
- метод синектики - применяется для решения креативных задач и поиска новых идей используя аналогии из других сфер и областей деятельности и «переноса» их на исследуемую проблему. К нему также относятся:

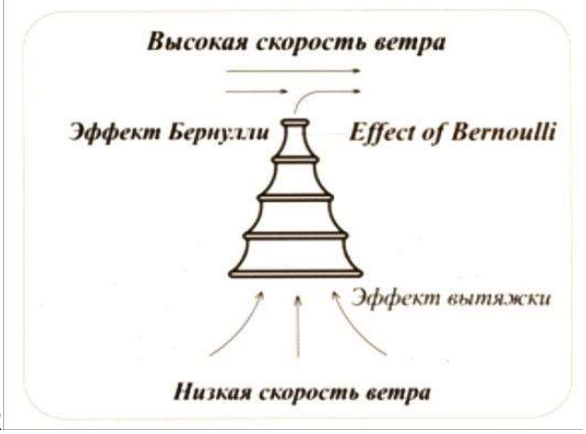
а) метод латерального мышления – т.е. бокового мышления, при которомпроисходит переключение от знакомого шаблона к новому;

б) креативная методика: "метод переноса как одна из базовых изобретательскихтехник".Эти методы основаны на свойстве мозгаустанавливать ассоциативные связи между явлениями, объектами, понятиями, чувствами, мыслями, впечатлениями и т.п.

Основная часть.

"Конус Бернулли" является эффективным средством для очистки воздушного бассейна городов от смога. Созданный с опорой на природные физические законы движения воздушных масс конус вызывает принудительное не только горизонтальное, но и вертикальное движение воздушных масс, способен пробить инверсионный слой и увести загрязненный воздух за пределы города даже при абсолютном безветрии на земной поверхности. Это происходит благодаря тому, что в верхних слоях атмосферы скорость ветра всегда значительно выше, чем в нижних слоях. Благодаря этой разнице возникает вертикальный ток воздушных масс внутри установки, который так и называется «эффектом Бернулли» (рис.1,2) либо «эффектом Вентури» или просто «эффектом вытяжки», который позволяет втянуть в полость конусного устройства загрязненный воздух и вывести его за пределы инверсионного слоя, где он будет разноситься более сильными потоками ветра.

1 

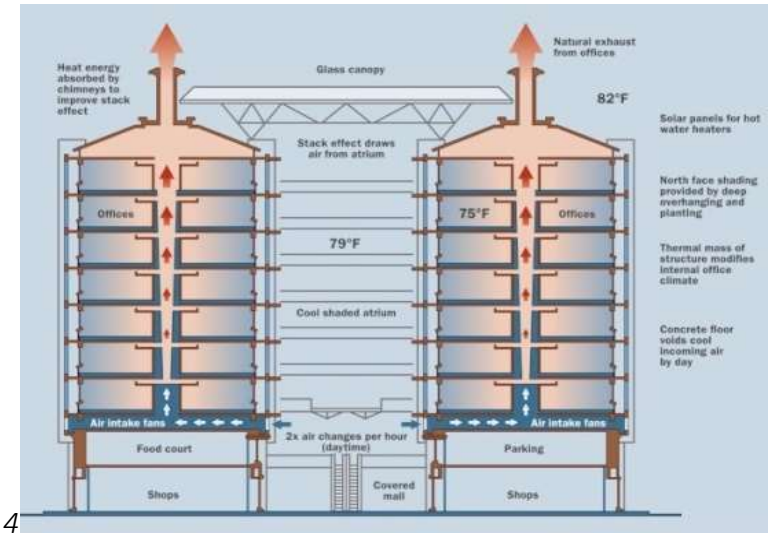


2

Рис.1, 2. Надувной Конус Бернулли над городом.

«Эффект Бернулли» известен с древнейших времён в природе и архитектуре (рис.3,4). Он успешно применяется в современном строительстве, где он известен как «Эффект Вытяжки».

3 

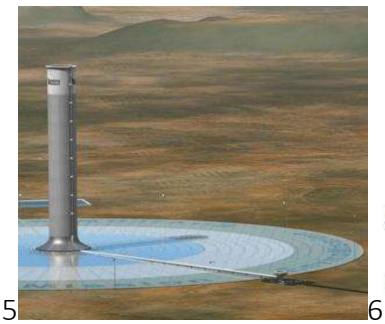


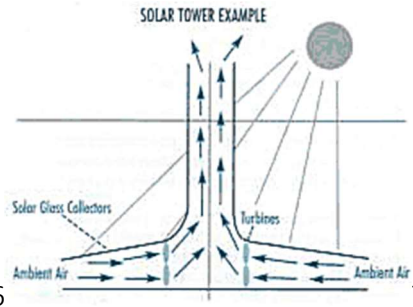
4

Рис.3.4. Эффект Вытяжки в природе и в современных домах.

В природе закон Бернулли проявляется во время урагана, когда из-за сильного ветра с домов слетают крыши. Это происходит, потому что скорость, с которой движется воздух вверху, очень большая, тогда как на чердаке она равна нулю. Как вы уже узнаете, там, где скорость потока больше, давление меньше, а там, где скорость меньше, давление больше. В результате образовавшейся разности давлений ураган и срывает кровлю.

То, что любая труба имеет вертикальную тягу за счет разницы температур и разницы скоростей ветра известна миру давно. Поэтому уже во многих местах мира появляются предложения по ее использованию (рис.5,6,7):

5 

6 

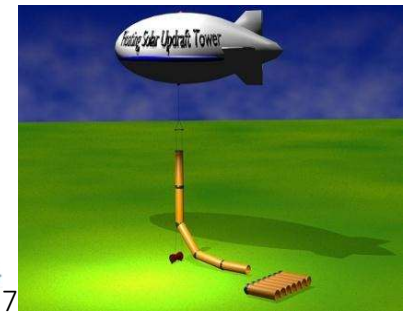
7 

Рис.5,6,7.Использование эффекта вытяжки в вертикальной трубе в современном мире.

Однако, они, как правило, очень громоздкие, дорогостоящие и трудоемки для установок. Поэтому предлагаемый нами "Конус Бернулли"основан на том, чтобы он был легко возводимым, экономным, мобильным для переноса в различные регионы и обеспечения энергией не только городской застройки, но и отдаленных населенных пунктов.

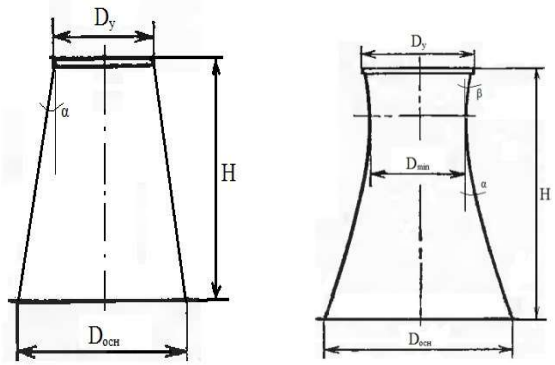


Рис. 8. Труба Конуса Бернули в виде усеченног оконуса. Рис.9. Труба Конус Бернуллисобразующей,выполненнойполемнискатев 12 градусов. Расчёт физиков И.Бахытжанов, Умбетова Э. Алматинский университет энергетики и связи, 2014г.

Главное достоинство нами предлагаемой установки в том, что она имеет форму конуса с тем, чтобы в зауженной верхней части, где устанавливается генератор, получить по закону Бернулли наибольшую скорость ветрового потока, затягивающегося в устройство. Более того, для снижения аэродинамического сопротивления Конуса Бернулли, образующая трубы выполняется по параболической зависимости, при этом самое низкое аэродинамическое сопротивление будет при использовании для поверхности образующей зависимости по лемнискате в 12 градусов (по расчётам физиков Б.Исмагзома .Э.Умбетова). Из рисунка видно, что появляется диаметр трубы в минимальном сечении D_{min}. Минимальное сечение делит трубу на нижнюю конусную часть с углом конусности α и верхнюю диффузорную часть также с углом конусностиβ,которые получаются исходя от вида образующей. Рекомендуемые углы конусности α = 12-15^{O}, β =2-3^{O}[2].

Существует похожая на наш «Конус Бернулли» наземная высокая труба с надувными кольцами, авторы А.Г.ТоровецаиВ.Б.СолдатоваСевастопольского национального технического университета[3], в которой конструкция выполнена в виде высотной трубы и может быть использована на объектах с вентиляционными и технологическими выбросами. Устройство представлено ниже, где показанное вертикальное сечение.

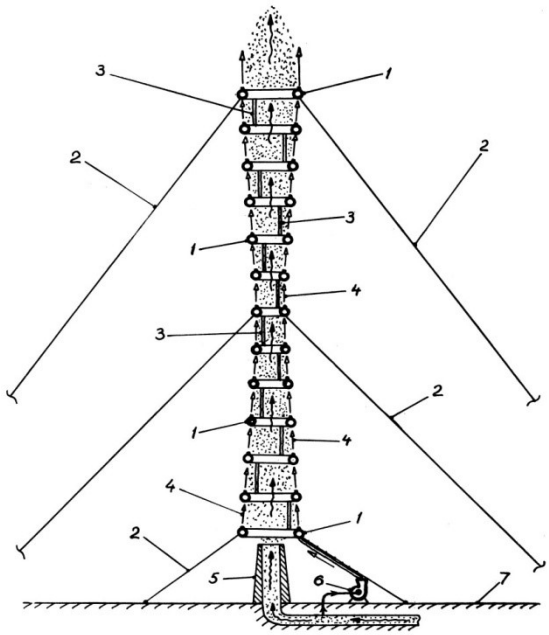


Рис.10. Высотная труба: 1 –кольцевые надувныеоболочки; 2– наклонныегибкие связи; 3– вертикальные гибкие связи. З.А.Г. Торовец, В.Б. Солдатов. Повышение экодогической эффективности устройств для выбросов в атмосферу. Севастопольский национальный технический университе тСтудгородок, г. Севастополь, Украина.

Высотная труба включает: ствол и установленных с шагом по высоте кольцевых трубчатых элементов 1 с соплами вертикальных трубчатых связей 3 между кольцевыми элементами 1; компрессор, для образования воздушной завесы 4, установленный на уровне земли 7; оттяжки 2, соединенные с лебедками. При этом трубчатые связи 3 выполнены гибкими, акольцевые трубчатые элементы 1–виде надувных оболочек различного диаметра, установленных по высоте ствола с образованием конфузорного, цилиндрического идиффузного участков, а оттяжки 2 закреплены к верхней средней инижнейн дувнойо болочке. Высотная труба работаетс ледующим образом. Прин акачивании в надувные оболочки 1 чере звертикальные трубчатые гибкие связи 3 с помощью компрессора 6 воздуха оболочки 1 приобретают плавучесть и поднимаются вверх, после чего ствол высотной трубы фиксируется оттяжками 2 относительно направляющего патрубка 5, становленного на уровне земли 7. Благодаря истечению воздуха из сопел надувных оболочек 1, между последними образуются кольцевые воздушные завесы. 4. Направляющие движение вверх в атмосферу удаляемых дымовых газов. Высота воздушных завес 4, равно как и общая высота трубы или ее расположение над уровнем земли 7, легко регулируются соответствующим изменением длины оттяжек 2 и вертикальных связей.

В качестве материала надувных оболочек 1 используют, например, стеклоткань в рубашке из эпоксидной смолы, а оттяжек 2 и гибких связей 3 армированное стекловолокно полиэфира.

Высотная труба обладает следующимип реимуществами: существенное снижение стоимости, малая масса, простота монтажа, обслуживании в процессе эксплуатации и демонтажа, высокая коррозионностойкость и кислотоустойчивость, долговечность, дополнительная очистка уходящих газов, улучшение рассеивания газов при большой дальнобойности факела, сейсмостойкость. Таким образом, предложенные устройства позволяют существенно повысить экологическую безопасность для процессов связанных с выбросами в атмосферу.

Из закона Бернулли и закона сохранения энергии выводится следствие, что при уменьшении сечения потока его скорость увеличивается. В доказательство приводим сопло ракеты (рис.11) и реактивного сверхзвукового самолета, имеющих форму конуса.

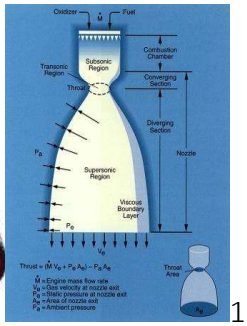
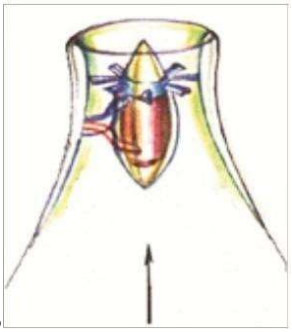
11   12  13 

Рис.11 Сопло ракеты. Рис. 12. Конусный диффузор Т.Д. Каримбаева.
Рис.13. Развёрнутый вертикально конусный диффузор Т.Д. Каримбаева.

Именно такая форма сопла позволяет вначале разогнать поток воздуха до очень высокой скорости, которая после прохождения самого узкого сечения вместо торможения все еще продолжает нарастать до сверхзвуковых значений!

Хорошим доказательством кэтому предложению также является конусный диффузор доктора технических наук Т.Д. Каримбаева (рис.12). Характеристики такой конструкции поразительны. За год ветродвигатель этого типа успевает поймать в 4 - 5 раз больше энергии, чем обычный. Очень ценна для нашего варианта еще одна его особенность — высокая скорость вращения ветроколеса. Достигается она с помощью диффузора именно конусной формы! В узкой его части воздушный поток особенно стремителен, благодаря чему генератор набирает немыслимые для ветряков обычной схемы обороты даже при сравнительно слабом ветре.Расчеты показали, что в условиях Подмосковья такой ветряк с диаметром диффузора всего в 2 метра за год может дать, как минимум, столько же тепла, что и полторы тонны каменного угля! В нашем же примере генератор устанавливается в значительно большем по масштабу вертикальном конусе (рис.13), хотя у нас имеются проекты моделей, меняющие наклон взависимости от направления ветра, однако они потребуют большего капиталовложения[4].

Считая, что трубные ветрогенераторы несут в себе ценную идею — вместо ловли случайных потоков ветра, здесь поток воздуха создается специально (принудительно). А это превращает нашу модель «Конус Бернулли" как вариант усилителя мощности в стабильный источник энергии!Из закона Бернулли и закона сохранения энергии выводится следствие, что при уменьшении сечения потока его скорость увеличивается. Поэтому в установке "Конус Бернулли" в зауженной части возникает сильный поток, где можно установить генератор для использования возникающей там энергии ветра. Также на сегодня хорошо известен Диоксид Титана, который совместо с УФ лучами превращает углекислый газ в кислород. На этой основе выпускаются, краски, строительные материалы, бетон и мн. др. С нами сотрудничает компания ТОО «Тенре-Аэролайф»казахстано-российская научно-производственная компания по проектированию, производству и сервису инновационных систем очистки воздуха на основе технологии фотокатализа.Онаимеет лицензию по фотокаталистическому устройству для очистки[5].

Таким образом, суть "Конуса Бернулли" заключена в следующем:

1. Вывод смога из города;
2. Обеззараживание атмосферы, превращение CO_2 в O_2;
3. Энергетическое обеспечение.

Установка «Конус Бернулли» использует закон физики движения воздушных масс "Эффект Бернулли", который применим для 2-х целей (одновременно или по отдельности):

1) нейтрализации влияния загазованной атмосферы на окружающую среду, очистка городской среды от смога, обеззараживание загазованного воздуха, превращение углекислого газа CO_2 в кислород O_2 (имеется патент на химизацию);
2) использовании возникающего ветрового потока внутри установки как автономной электростанции дарового источника энергии; имеет преимущества перед другими ветрогенераторами, не привязан к розе ветров, может применяться повсеместно, особенно эффективен для удаленных и труднодоступных районов.

Конус Бернулли может являться частью архитектурных сооружений, находиться внутри зданий, например, как в проекте МЖК "Тау-Самал", спроектированный одним из авторов статьи Рахимжановой Л.Ш. для г.Алматы на перекрёстке ул. Джандосова и Навои в Институте «Куат-Проект» в 2006г.

Рис.14. Проект МЖК «Тау-Самал»на перекрёстке ул. Джандосова и Навои

Благодаря центральному зданию, использующему Эффект Бернулли, застройка втягивает загазованный воздух с окружающей территории и перед выбросом превращает углекислый газ в кислород. Такую химическую реакцию даёт Диоксит Титана совместно УФ лучами Он также вырабатывает энергию, необходимую для снабжения района.

Эффект Бернули широко использовался с древнейших времен в народной архитектуре, например в юрте и других купольных сооружениях:

Рис.15. Применение «Эффекта Бернулли» в народной архитектуре.

Заключение.

Таким образом, предлагаемый «Конус Бернулли» является эффективным методом для очистки воздушного бассейна городов. Он основывается на принципе ускорения потока воздуха через узкое пространство, что приводит к уменьшению концентрации загрязнителей в воздухе. Этот метод может быть использован в сочетании с другими технологиями для борьбы с загрязнением воздуха и улучшения качества жизни в городах. В целом, использование эффекта Бернулли для очистки воздуха является перспективным направлением в борьбе за экологическую безопасность и здоровье населения.

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Medical Sciences

Tobacco and E-cigarettes: a comparative analysis of oral health impact and dental prevention methods

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Introduction

The widespread use of both traditional tobacco products and electronic cigarettes (vapes) poses a significant threat to oral health. According to the World Health Organization (WHO), over 1.3 billion people are smokers, and approximately 8 million die annually from smoking-related causes (WHO, 2022). Concurrently, the number of e-cigarette users, especially among youth, is rapidly increasing, reaching approximately 82 million in 2023 (Our World in Data, 2023).

The aim of this article is to conduct a comparative analysis of the impact of tobacco products and e-cigarettes on oral health, with a focus on dental diseases associated with their use. This article also provides practical preventive recommendations to help minimize the adverse effects of these products on dental health. Such an approach is particularly valuable for dentists and researchers, as it enables a better understanding of the risks and suggests effective preventive measures for patients.

Chemical composition and mechanisms of impact

To understand the differences in the impact of traditional tobacco products and e-cigarettes, it is essential first to examine their chemical composition. Traditional cigarettes contain nicotine, tar, and carcinogenic substances such as benzopyrene and nitrosamines, which are formed during the combustion of tobacco (Oral Health Foundation, 2022). These substances reduce blood flow to the gums and damage tissues, causing inflammation and impeding wound healing. As a result, regular smoking significantly increases the risk of caries and gum diseases, such as gingivitis and periodontitis (Better Health Channel, 2022).

In contrast, e-cigarettes contain liquids that include nicotine, propylene glycol, glycerin, and various flavorings. Although vapes lack combustion products, research shows that their components also negatively impact oral health. For instance, propylene glycol and glycerin cause dry mouth (xerostomia), reducing saliva's protective functions and promoting plaque formation and the proliferation of pathogenic bacteria (MDPI, 2023). Therefore, despite the absence of combustion, e-cigarette liquids create conditions conducive to harmful bacterial growth and the development of dental diseases.

Impact on oral microflora and gum diseases

One of the most significant aspects of the impact of tobacco and e-cigarettes is their effect on the oral microflora. A study by Global Public Health (2023) found that tobacco smoking leads to a substantial reduction in beneficial bacteria levels, which support the balance of the oral microbiome. This disruption in microflora encourages the growth of pathogenic microorganisms, increasing the risk of caries, gingivitis, and periodontitis (Oral Health Foundation, 2022).

Additionally, nicotine and tar in tobacco promote plaque formation, which damages gums and tooth enamel.
E-cigarettes also negatively affect the oral microflora, although the mechanism of impact differs slightly. Propylene glycol and glycerin, contained in vape liquids, alter the microflora balance, increasing the number of pathogenic bacteria and contributing to inflammatory processes in the gums and other oral tissues (Dental Health Foundation, 2022). Studies indicate that this impact also raises the risk of caries and gum diseases. Thus, both traditional cigarettes and e-cigarettes exert a destructive effect on oral microflora, promoting the development of severe dental diseases.

Comparative analysis of dental disease risks
To illustrate the differences between tobacco products and e-cigarettes, the table below describes the main dental risks associated with the use of each type of product.

Factor	Traditional Cigarettes	Electronic Cigarettes (Vapes)
Nicotine	High level, reduces gum blood flow, impairs healing (Oral Health Foundation, 2022)	Present in liquid form, causes inflammation and dry mouth, leading to xerostomia (Nature, 2023)
Tar and Carcinogens	Contains tar and combustion products, increases the risk of oral cancer (WHO, 2023)	No combustion products, but propylene glycol and glycerin negatively impact microflora (MDPI, 2023)
Effect on Microflora	Decreases beneficial bacteria, promotes pathogenic microorganism growth (Global Public Health, 2023)	Propylene glycol disrupts microflora balance, increasing harmful bacteria (Dental Health Foundation, 2022)
Risks for Teeth and Gums	Increases risk of caries, periodontitis, and gum diseases (Better Health Channel, 2022)	Increases risk of caries and gum inflammation due to dry mouth (Better Health Channel, 2022)

Practical recommendations for prevention
Based on the presented analysis, several practical recommendations can be suggested to minimize the adverse impact of tobacco products and e-cigarettes on dental health.
First, regular visits to the dentist are essential for patients who use nicotine products. It is recommended to visit the dentist at least twice a year for preventive check-ups and professional teeth cleaning, which allows for timely detection and prevention of oral diseases (WHO, 2023).
Second, the use of fluoride-containing toothpaste and antimicrobial mouthwash can significantly reduce the risk of caries and gum disease. Fluoride helps strengthen tooth enamel, while antimicrobial agents reduce the bacterial load on gums and teeth (Better Health Channel, 2022).
Finally, the most effective way to protect oral health is complete cessation of smoking and vaping. Nicotine replacement therapies (patches, gums) and behavioral support programs can assist in overcoming these harmful habits (WHO, 2023).

Conclusion

In conclusion, both traditional tobacco products and e-cigarettes have a significant adverse impact on oral health. Traditional cigarettes, which contain tar and carcinogens, increase the risk of oral cancer and serious gum inflammation. Although e-cigarettes do not contain combustion products, they negatively affect the microflora, causing dry mouth (xerostomia) and contributing to gum inflammation and caries development.

Based on scientific evidence, it can be concluded that traditional cigarettes pose a greater risk of developing oral cancer, while vapes more frequently lead to inflammatory diseases due to microflora changes and saliva deficiency. These findings underscore the importance of preventive care and regular oral hygiene for all nicotine product users. However, the best solution remains complete cessation of both traditional and electronic cigarettes.

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CANCER SCREENING IN KAZAKHSTAN: A COMPREHENSIVE ANALYSIS

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Annotation: In this scientific and analytical work, the indicators of incidence and mortality from cervical cancer, breast cancer and colorectal cancer in the regions of our country are considered. The screening methods currently used and the results of this preventive survey of the population are described in detail. Detailed step-by-step algorithms are presented, and the principles of organization and diagnostic capabilities of the screening program for the active detection of these nosological forms of malignant neoplasms in clinically asymptomatic individuals are reflected.

Key words: cervical cancer, breast cancer, colorectal cancer, epidemiology, incidence, mortality, screening, Pap test, smear for oncocytology, mammography, hemocult test, fecal occult blood test - FOBT, total colonoscopy.

Today, one of the most important postulates of the oncology service continues to be the early diagnosis of malignant tumors. The purpose of screening is to identify asymptomatic (preclinical) cancer or precancerous conditions in an otherwise healthy target population. In this case, screening plays a leading role in secondary cancer prevention. The key concept of cancer screening is to identify pathology at a stage of development when the effectiveness of treatment

is maximum and the prognosis is most favorable. When precancerous diseases are detected during screening, secondary prevention methods allow to prevent the transition of the initial pathological state to cancer. In this case, the main conditions for screening are the presence of trained personnel and a standard approach to identifying the trait being studied and evaluating the results. The methods used must be sufficiently simple, reliable and reproducible, as well as have sufficient sensitivity and high specificity [1-3].

Screening plays an important role in improving early diagnosis and treatment outcomes. According to the Guide to Cancer Early Diagnosis by Ilbawi A. et al. [4], screening aims to detect unrecognized cancer or its prior lesions in a typically healthy, asymptomatic population through tests or other procedures that can be applied quickly and are widely available to the target population. In screening, the target population is assessed for unrecognized cancer or precancer, and most people tested will not be diagnosed with the disease. Screening should be seen as a process and not as the performance of a specific test, examination, or procedure. The screening process includes a system of informing and inviting the target population to participate; administering the screening test; following-up with test results and referral for further testing among those with abnormal test results; ensuring timely pathologic diagnosis, staging and access to effective treatment with routine evaluation to improve the process. A screening program encompasses the process from invitation to treatment and requires planning, coordination and monitoring and evaluation.

To date, the republican oncological screening program includes three nosological forms of malignant neoplasms - cervical cancer (CC), breast cancer (BC), colorectal cancer (CRC). Let's consider the current epidemiological indicators, methodology and results of cancer screening in our country.

CC in the structure of all malignant tumors of both sexes of the population in 2022 took 6th place with a share of 5.51% (2021 - 4th place, 5.54%), in women - stable 2nd place - 9.7% (9.7%) [5].

The incidence rate per 100 thousand population increased from 9.4 to 9.92. In 10 regions of the republic, the incidence rate is higher than the national average: Pavlodar - 17.2 per 100 thousand people. (2021 – 16.7) – the highest level, East Kazakhstan – 14.3 (10.8), North Kazakhstan – 14.3 (10.2), Atyrau – 13.2 (13.8), Zhetysu - 11.7, Karaganda - 11.7 (12.0), Abay - 11.1, Akmola - 11.1 (11.9), Mangistau - 11.1 (9.7), Kostanay - 10.8 (10.6) regions.

Low incidence rates in Zhambyl region - 5.8 per 100 thousand population (5.7), Turkestan region - 6.1 (5.2), Aktobe region - 8.3 (11.6), Kyzylorda region - 8.5 (8.2) areas.

CC in the structure of causes of death from malignant tumors of the population of both sexes in 2022 rose from 9th to 8th position, with a share of 4.6% (2021 - 4.3%), mortality from CC is stable at 3.1 per 100 thousand population (3.1).

The mortality rate from CC in 10 regions is higher than the national average: Akmola - 4.2 per 100 thousand population (2021 - 3.1) - maximum level, West Kazakhstan - 4.1 (4.8), Pavlodar - 3.8 (5.6), Almaty – 3.7 (2.5), Zhetysu – 3.7, Atyrau – 3.4 (4.0), East Kazakhstan – 3.3 (3.8), Karaganda - 3.2 (4.7), Kostanay - 3.2 (2.4) regions and Almaty city - 3.4 (2.9).

Below the national average, mortality was recorded in Abay region, cities Astana, Shymkent - 2.9 per 100 thousand population, Mangistau - 2.8 (3.0), Turkestan - 2.3 (2.2), Aktobe - 2.2 (3.0), North - Kazakhstan - 2.0 (2.6), Kyzylorda regions - 1.7 (3.5) - the best result [5].

In 12 regions, a 100% level of morphological verification of the diagnosis was ensured, the lowest or worst indicator for the third year was in the Kyzylorda region - 94.3%, below the national average indicators in Akmola - 98.8%, Atyrau - 98.9%, Kostanay - 98, 9%, Mangistau - 97.6%, Pavlodar - 96.6%, regions and Almaty city - 98.5%;

In a number of regions, the frequency of diagnosis of stage I-II CC was below the national average (88.1%) - in Akmola - 76.2% (2021 - 73.6%) - the worst result in the country, in Karaganda

- 77, 2%, Zhetysu - 82.9%, Abay - 83.8%, Kostanay - 84.3%, Aktobe - 85.5%, West Kazakhstan - 85.7%, Pavlodar - 81.3%, while that in the Atyrau region - 100.0% result.

The proportion of stage IV CC is higher than the national average (2.7%) in the following regions: the worst result is in Zhetysu (6.1%), above the national average in Karaganda - 5.1% (2021 - 5.6%), Akmola - 4.8% (2.3%), Kostanay - 4.5% (4.4%), North Kazakhstan - 3.9% (7.4%), Almaty - 3.7 % (5.1%), Zhambyl - 2.9% (0.0) regions, cities Almaty – 3.6% (1.8%) and Shymkent – 3.8% (5.9%). The lowest neglect is in the East Kazakhstan region - 1.0% (0.7%).

Late diagnosis rates (III-IV stages) for CC are above the national average - 11.9% (15.4% in 2021) were noted in Akmola - 23.8% (2021 - 26.4%) - worst result, Karaganda - 22.8% (35.2%), Pavlodar - 18.8% (20.8%), Zhetysu - 17.1% (24.2%), Abay - 16.2% (12.8%), Kostanay - 14.6% (15.6%), Aktobe - 14.5% (9.6%), West Kazakhstan - 14.3% (32.4%) regions. The lowest neglect is in the Mangistau region - 6.0% (20.8%).

Across the country, the five-year survival rate of patients with CC registered in 2018 was 59.9% in 2022, with a decrease from the level of 2021 (67.5% for those registered in 2017), and with a significant range in by region, from the maximum – 72.9% (2021 – 70.7%) in the North Kazakhstan region, to the minimum – 34.9% (64.4%) in the Atyrau region [5].

CC screening is a periodic, comprehensive examination of women of a certain age group as part of a special medical program to prevent and reduce incidence and mortality from CC.

Type of screening - population. The purpose of screening is to identify pre-invasive diseases of the cervix with subsequent recovery. The screening method is a cytological examination of a smear for oncocytology from the cervix (traditional and liquid cytology). Coloring according to the "Papanicolaou test" (Pap test). Interval - 1 time in 4 years. Target group: women aged 30-70 years who are not registered in the dispensary for CC. The expected results are a decrease in incidence and mortality from CC.

Screening steps:

1) Preparatory - formation of target groups, information support and invitation to screening. The preparatory stage is carried out by the nurses of the primary health care organization responsible for preventive measures and includes: annual compilation of a list of women subject to screening in the coming year by November 15 of the current year, followed by monthly correction; informing target groups of the female population about the need for screening; screening invitation; ensure timely screening.

2) Screening - filling out a statistical card of a preventive medical examination (screening) of an outpatient (form 025-08/y), a register of patients subject to cytological screening and taking material for cytological examination from the cervix. The screening examination of the target groups of the female population is carried out by a specially trained midwife of the primary health care organization.

3) The final one is obtaining the results of cytology, informing the woman and developing further management tactics, fill out accounting and reporting statistical documentation. Responsible for the final stage of screening is the obstetrician-gynecologist of primary health care [6].

Cytological screening of CC is a complex of organizational and medical measures aimed at early detection of precancerous and neoplastic diseases of this localization and at reducing the mortality of this cohort of patients. For traditional cytology, a smear containing 8-12 thousand cells of stratified squamous epithelium (including cells of metaplastic epithelium) is considered adequate; for liquid cytology - 5 thousand cells. For both methods, the number of cells of endocervical epithelium and/or metaplastic epithelium (from the transformation zone) must be at least 10 (single or in clusters). If more than 75% of the cells of the stratified squamous epithelium are covered with erythrocytes, leukocytes, etc., then the quality of the smear is considered unsatisfactory.

Interpretation of the results of a cytological study is carried out according to the Bethesda-terminology cytological system:

Intraepithelial changes and malignant processes are absent (NILM). This group includes cytological conclusions about the normal state of the epithelium, as well as the presence of various non-neoplastic diseases. Normally, squamous epithelial cells, groups of cells of columnar epithelium and metaplastic epithelium, a small number of leukocytes, and rod/mixed microflora are found in preparations. In the presence of non-neoplastic processes, their nature and, if possible, the cause are specified: atrophic changes, reactive changes associated with inflammation, including typical regeneration. In addition, the presence of microorganisms is indicated: Trichomonas vaginalis, fungi, morphologically corresponding to Candida spp., bacterial vaginosis, cellular changes corresponding to the defeat of Herpes simplex virus, squamous epithelial cells with atypia of unknown significance (ASC-US), squamous epithelial cells with atypia of unclear significance, not excluding the presence of a high degree of intraepithelial changes (ASC-H). Low-grade squamous intraepithelial changes (LSIL) include lesions associated with HPV and CINI, high-grade squamous intraepithelial changes (HSIL) include CINII, CINIII, carcinoma in situ and cases suspected of invasion, squamous cell carcinoma, cervical (glandular) epithelium with atypia of unknown significance, cells of the cervical (glandular) epithelium, possibly neoplasia, endocervical adenocarcinoma in situ, endocervical adenocarcinoma, endometrial adenocarcinoma, secondary adenocarcinoma, unclassified carcinoma, other malignant tumors.

There are certain features when taking material for oncocytology: firstly, the examined woman should be informed about the exclusion of sexual intercourse, vaginal manipulations, including douching, baths, tampons, etc. 2 days prior to sampling. Taking material for cytological examination is carried out by the midwife of the examination room of the department of medical examinations of the primary health care organization: the traditional method (2 glasses - with obligatory fixation in 96% alcohol, it is preferable to use glass slides with a polished edge, which are easily marked) or the liquid cytology method (one container with stabilizing liquid); the code or surname of the patient, identical to the code and surname in the form for sending material for cytological examination, should be clearly marked on the glasses or container [6].

At the same time, when using the traditional method, the biomaterial is delivered to the cytological laboratory as soon as possible after its collection in specialized containers for glass slides with 96% alcohol. If there are visible visual changes in the cervix, then the material is taken from the woman and, without waiting for the results, she is referred for an examination by an obstetrician-gynecologist.

A cytological study is carried out in centralized cytological laboratories at oncological institutions, where an archive of cytological preparations of patients involved in the screening examination is formed, regardless of the result, for a period of at least 10 years with the formation of a computer database.

What material and technical equipment is required to take material for a Pap test? It is as follows: soap and water for washing hands, a light source for cervical examination, a gynecological chair, a disinfected speculum and gloves, an Eyre spatula, a glass slide and a marking pen, a container with a stabilizing solution for liquid cytology, a fixative solution (96% alcohol), a container with warm water for lubricating and warming the vaginal mirrors, a 0.5% chlorine solution for disinfecting gloves and instruments, or another approved for this purpose. And, of course, the registration form itself.

For carrying out liquid cytology, you additionally need: a disposable cervix brush, a container with a stabilizing solution for liquid cytology, and a fixing solution.

At the same time, a smear for oncocytology cannot be taken: during menstruation, earlier than 48 hours after sexual contact or after using lubricants, vinegar or Lugol solution, tampons or spermicides, after vaginal examination or douching, and also during the treatment of genital infection.

Now, regarding the results of CC screening. In 2022, 771,282 women of the target group aged 30 to 70 years were examined during cytological screening (in 2021 - 757,454).

During cytological screening in 2022, 392 cases of cervical cancer were identified (319 in 2021). The detection rate increased from 0.42 to 0.51 per 1000 women examined

High detection of CC during screening is ensured in Aktobe, Almaty, Atyrau, East Kazakhstan, Kyzylorda, Pavlodar, North Kazakhstan, Turkestan regions and Shymkent city. The detection rate in these regions ranges from 0.55 to 1.59 per 1000 women examined. The best indicator is in Atyrau region - 1.59. Compared to 2021, there is an increase in detection in 10 regions, with the exception of Akmola, Aktobe, Zhambyl, Kostanay, Mangistau, North Kazakhstan regions and Shymkent city. The worst result in Astana is 0.15 per 1000 women examined [5].

Cytologically, cervical precancer was detected in 1.16% of those examined (2021 – 0.99%). The detection rate of precancer below 0.6% (the planned indicator for 2022, according to the Comprehensive Plan) was noted in Aktobe, Karaganda and Kostanay regions.

A high proportion of stage I CC (70% or more) was detected in 6 regions of the country (in 8 in 2021): Kostanay, Mangistau (94.7% - best result), North Kazakhstan, Turkestan regions, cities Almaty and Astana. Low levels of early detection of CC (below 50%) were not observed in any region.

Localized processes (stages I-II) were identified in 99.2% of all cases of detected cancer (96.5%). In the Akmola and Karaganda regions, cases of CC were identified not only in localized, but also in widespread stages of the process. A total of 3 cases of CC in stage III and no cases in stage IV were identified (11 and 0, respectively) [5].

BC ranks first in the structure of the frequency of malignant tumors of both sexes in the population with a share of 14.7% (2021 - 15.4%). This situation has been stable since 2004; in addition, BC ranks first and remains consistently in this position in the structure of female oncopathology. The incidence of BC in 2022 in the country as a whole increased to 26.5 per 100 thousand (2021 – 26.3). In the structure of cases, BC occupies the 1st ranking place in the vast majority of regions and cities of the country, except for three: Akmola, Kyzylorda and North Kazakhstan regions, where lung cancer takes the 1st ranking place [4].

Above the national average - 26.5 per 100 thousand of us. – incidence of BC in 10 regions of the country: Abay – 33.3, Akmola – 32.7 (2021 – 29.8), East Kazakhstan – 44.7 (39.9) – the highest level, West Kazakhstan – 31.2 (28.4), Karaganda – 40.2 (40.1), Kostanay – 37.5 (35.8), Pavlodar – 43.2 (47.4), North Kazakhstan – 34.7 (38.2) regions and Almaty city – 35.4 (34.5), Astana city – 31.5 (28.4). Below average indicators per 100 thousand of us. in Aktobe - 21.6 (24.3), Almaty - 21.9 (17.7), Atyrau - 22.8 (15.7), Zhambyl - 14.2 (15.1), Zhetysu - 22.8, Kyzylorda - 14.6 (14.4), Mangistau - 14.7 (17.3), Turkestan - 11.3 (11.7) regions and Shymkent city - 14.9 (21.9) [5].

BC ranks third in the structure of causes of death from malignant tumors in the population of both sexes for the thirteenth year in a row, amounting to 8.1% in 2022 (2021 – 8.7%). In the republic as a whole, mortality from BC decreased by 13.0%, from 6.2 to 5.4 per 100 thousand people.

The regions where mortality from BC is higher than the national average include: Abay - 10.1 per 100 thousand people (maximum level), East Kazakhstan - 8.0 (2021 - 8.5), Pavlodar - 7.1 (10.0), North Kazakhstan - 7.0 (11.4), Kostanay - 6.9 (7.5), Akmola - 6.5 (8.2), West Kazakhstan - 5.7 (6.9), Zhambyl - 5.5 (4.8) and Astana city – 6.3 (6.6), Almaty city – 6.6 (9.5). The indicators are significantly lower in Aktobe - 4.5 (3.5), Almaty - 4.5 (5.8), Zhetysu - 4.0, Atyrau - 3.7 (3.0), Kyzylorda - 4.4 (4.1), Turkestan - 3.6 (3.6), Mangystau regions - 2.7 (3.6) - the lowest level [5].

Mass screening to identify BC patients should mainly involve healthy women without any signs of the disease or symptoms. Screening not only helps to detect hidden forms of cancer that can be treated, but also has psychological value for women. As a result of screening, women are convinced that they do not have BC, and this is the most important potential success of such programs. While the ultimate goal of screening is to reduce BC mortality, its immediate goal is to detect cancer before clinical manifestation. However, BC is a heterogeneous disease, which can significantly affect the effectiveness of screening. Screening models for BC are usually based on the fact that the majority of detected tumors are invasive cancers in the early stage of progression. In addition, it must be taken into account that the detection of cancer (or its precursors) before clinical manifestation increases the risk of false positive diagnosis [7,8].

Mammography has a sensitivity of 95% and a specificity of 97%. These indicators decrease when examining women with denser mammary glands (young age, use of hormone therapy), with low quality mammography, and also with insufficient qualifications of the radiologist. Detection of high-grade invasive cancer by screening, when the tumor is not yet detected by clinical examination (palpation), means the possibility of reducing mortality from BC [9].

Preventive screening for early detection of BC in the Republic of Kazakhstan includes [10]:

1) mammography of both mammary glands in two projections - direct and oblique in the mammography room of the city, district polyclinic (mobile medical complex). All digital mammograms in the presence of a system for archiving and transferring medical images are copied to CDs and other electronic media and transferred to the server of the mammography room of the Cancer Center using specialized licensed software integrated between medical organizations; in case of impossibility of digital transmission - they are printed on X-ray film at a scale of 1:1 - 100% (1 patient - 1 set - 2 or 4 mammograms) with subsequent transfer to the mammography room of the Cancer Center;

2) interpretation of mammograms according to the BI-RADS classification (M0t, M0d, M1, M2, M3, M4, M5) by two or more independent radiologists of the same medical organization - double reading or different medical organizations: a radiologist of the mammography room city, district polyclinic (mobile medical complex) - the first reading, and the radiologist of the mammography room of the Cancer Center - the second reading;

3) in-depth diagnostics - targeted mammography, ultrasound examination (hereinafter - ultrasound) of the mammary glands, trepanobiopsy, including under ultrasound or stereotaxic control for histological examination, which is carried out in case of detection of pathological changes on mammograms (M0d) in the mammography room of the Cancer Center.

√ An average medical worker or a responsible person of the organization of outpatient care sends the patient for mammography to the district, city polyclinic.

√ The X-ray laboratory assistant of the mammography room of the city, district polyclinic (mobile medical complex) performs mammography, fills out a referral for double reading of mammograms and transmits the referral through information interaction.

Radiologist of the mammography office of the city, district polyclinic (mobile medical complex): fulfills the requirements for the safety and quality of mammographic examinations; evaluates the quality of the images provided and the correctness of the installation; performs repeated mammography in the M0t category (technical errors of mammography); determines the radiological density of the mammary glands on the ACR scale (A, B, C, D) indicating this parameter in the study protocol; conducts the first reading of mammograms with interpretation of the BI-RADS classification results. In the M0d category (undetermined or suspicious radiological changes requiring additional examination), the study protocol indicates the predominant pathology: education, asymmetry, violation of architectonics, microcalcifications; sends mammograms, electronic copies of mammograms through the archiving system and transfer of medical images to the workplace of the mammography office of the Cancer Center together with directions for

double reading of mammograms; directs low–dose computed tomographic images through the system of archiving and transferring medical images to the workplace of the computer tomography office of the Cancer Center together with copies of images recorded on CD-ROMs or other electronic media and directions for double reading.

♦ The radiologist of the mammography room of the Cancer Center: evaluates the quality of the provided images and the correctness of the styling. Viewing digital x-ray images transferred to the server or on digital media (CD, DVD) is carried out on a monitor for interpreting digital x-ray images with a resolution of at least 5 megapixels, which has a certified grayscale transmission in accordance with the DICOM standard; conducts a double (second) reading of mammograms with the interpretation of the results according to the BI-RADS classification, using, if necessary, archival images. Organizes the third reading according to indications. With double reading, an independent interpretation of the images is carried out (blinding method - the second radiologist does not know the results of the first reading); in the M0m category (technical errors in mammography), recommends repeat mammography; in the M0d category (uncertain or suspicious radiographic changes requiring additional examination), the study protocol indicates the predominant pathology: education; asymmetry, violation of architectonics, microcalcifications; recommends that the outpatient care organization, according to indications, invite the patient for in-depth diagnostics (targeted mammography, ultrasound of the mammary glands, trephine biopsy, including under ultrasound or stereotaxic control, followed by histological examination of the material); collects and archives all mammograms (films and electronic media) made as part of the examination. The shelf life of mammograms is at least 3 years after leaving the age subject to a screening study; the results of the double (second) reading are transferred to the outpatient care organizations through information exchange.

♦ Indications for in-depth diagnostics are the conclusions of double reading mammograms M0d (uncertain or suspicious X-ray changes requiring additional examination).

♦ In-depth diagnostics is carried out in two stages. At the first stage, ultrasound is performed, according to indications, targeted mammography, possibly with an increase (with asymmetry, violation of architectonics and the presence of microcalcifications). When visualizing a suspicious pathology (M4 and M5), the second stage is performed - trepanbiopsy, including under ultrasound control and stereotaxic control for histological examination.

♦ Histological examination is carried out in the laboratory of pathomorphology or pathological bureau. Morphological interpretation of the biopsy is carried out in accordance with the recommendations of the World Health Organization.

♦ Physician or responsible person of the outpatient care organization:

1) upon receipt of a mammography result according to the BI-RADS classification:

- in case of M0t (technical errors in mammography) - sends the patient for a second X-ray examination to the mammography room of the city, district polyclinic (mobile medical complex);

- with M0d (undefined or suspicious X-ray changes requiring additional examination) - sends the patient for in-depth diagnostics to the mammography room of the Cancer Center;

- with M1 (no changes detected) - recommends that the patient undergo a follow-up mammography examination after 2 years. With radiological density of the mammary glands, C and D are sent for ultrasound of the mammary glands to exclude a false-negative result of mammography;

- with M2 (benign changes), refer the patient for a consultation with an oncologist (mammologist) of the clinical diagnostic department, followed by a screening mammography examination after 2 years;

- with M3 (probable benign changes) - sends the patient for short-term dynamic radiation observation to the local doctor with the recommendation of control mammography or ultrasound in 6 months;

- with M4 (signs that cause suspicion of malignancy), M5 (practically reliable signs of malignancy) and if it is technically impossible to perform a trepanbiopsy or a biopsy is refused, a referral to an oncologist (mammologist) of the clinical diagnostic department for dynamic observation and decision on the verification of the identified pathology;

2) upon receipt of the result of a histological examination:

- benign education - refers the patient to an oncologist (mammologist) of the clinical diagnostic department for dynamic monitoring, followed by a screening mammography examination after 2 years;

- formation with an indeterminate malignant potential or carcinoma in situ - refers the patient to the Cancer Center for consultation and treatment, followed by dynamic observation by an oncologist (mammologist) of the clinical diagnostic department at the place of her attachment;

- malignant neoplasm - refers the patient to the Cancer Center for treatment and follow-up;

3) communicates the results of the screening examination to the patient in any available way (by telephone, in writing, through electronic means of communication);

4) enters the results of double reading, in-depth diagnostics, histological examination, recommendations of the radiologist of the Cancer Center mammography room into the information system.

Establishing the size of the primary tumor is especially important in screening. Tumor size is an important criterion for evaluating the quality of screening and determining the ability of X-ray mammography to detect non-palpable tumors. Therefore, it is extremely important that pathologists measure tumor diameter as accurately as possible. The smaller the size of the primary tumor, the greater the likelihood of error in determining its size.

Let's analyze the results of BC screening. Mammography screening identified 1,570 cases of BC in 2022 (1,402 in 2021). The cancer detection rate increased from 1.78 to 1.94 per 1000 examined. The best result is in the Karaganda region – 2.63 per 1000 women examined. Low detection rate per 1000 examined, compared to the republican average, in Atyrau (1.72), Zhambyl (0.58), Kyzylorda (1.68), Mangistau (0.42 - worst result), Turkestan (1.22) regions and cities Astana (1.5) and Shymkent (1.58). Compared to 2021, there was an increase in the detection of BC in 9 regions, with the exception of Aktobe (decrease from 2.87 to 2.19 per 1000 women examined), Karaganda (from 2.73 to 2.63), Mangistau (from 1.10 to 0.42), North Kazakhstan (from 3.27 to 2.31), Turkestan (from 1.36 to 1.22) regions and cities Astana (from 1.54 to 1.50), Almaty (from 2.24 to 2.18) and Shymkent (from 2.35 to 1.58) [5].

In 2022, the proportion of patients identified during screening studies with early stages of BC (stage 0-I) was 50.2% during screening (in 2021 - 47.9%). A high proportion of stages 0-I BC (over 50%) was recorded in 8 regions (in 8 in 2021): Akmola, West Kazakhstan, Karaganda (70.8% - best result), Pavlodar, North Kazakhstan, Turkestan regions, cities Astana and Shymkent. Low levels of early detection of BC (below 40%) were noted in Aktobe (19.3% - worst result), Zhambyl (34.8%), Kostanay (39.5%), Mangistau (27.3%) regions and Almaty city (37.3%). Localized cancer (0-I and II stages) amounted to 96.2% (2021 - 95.5%), while not a single case was detected in stages III-IV in Atyrau, West Kazakhstan, Zhambyl, Kyzylorda, Mangistau, Pavlodar regions, cities Astana and Shymkent. A total of 46 cases of breast cancer in stage III and 14 in stage IV were identified (52 and 11, respectively) [5].

Epidemiological indicators of CRC in the form of colon cancer and colorectal cancer are considered separately for objective reasons.

Colon cancer with a specific gravity of 5.53% (2021 - 5.2%) in the structure of oncopathology of both sexes of the population has risen to 5th place, in men it remains in 6th place - 5.8% (5.5 %), for women - in the 5th - 5.3% (4.91%) The incidence rate of cancer of this localization in the country in the reporting year increased from 8.8 to 9.95 per 100 thousand

population.

The incidence of colon cancer in 10 regions is higher than the national average - 9.95 per 100 thousand population: Kostanay - 20.7 (2021 - 15.9), Pavlodar - 18.8 (15.3), North Kazakhstan - 18, 0 (12.7), East Kazakhstan - 16.9 (13.4), Karaganda - 15.4 (15.0), Akmola - 14.6 (10.2), West Kazakhstan - 11.0 (10.1), Abay - 10.0 (9.0) regions and cities Almaty – 12.8 (12.1) and Astana – 10.5 (9.0). As in 2021, colon cancer was detected much less frequently in Turkestan - 3.1 per 100 thousand population (2.7), Kyzylorda - 4.1 (4.6), Zhambyl - 5.5 (5.8), Almaty - 6.3 (4.7), Zhetysu - 6.4, Mangistau - 6.8 (4.9) regions and Shymkent city - 5.0 (4.0) [5].

Rectal cancer in the structure of malignant neoplasms of both sexes retains 7th place in rank with a specific gravity of 4.9% (2021 - 4.92%), but in men it dropped from 4th to 5th place - 6.1%, for women – from 9th to 10th – 4.0%. The incidence rate per 100 thousand population increased from 8.4 to 8.8.

A high incidence rate was recorded in Kostanay - 17.8 per 100 thousand population (2021 - 16.2), East Kazakhstan - 17.7 (13.9), North Kazakhstan - 15.6 (15.1), Pavlodar – 14.9 (18.1), Karaganda – 13.3 (11.7), Abay – 12.9, West Kazakhstan – 12.9 (9.8), Akmola – 10.3 (13.1) regions and Astana city – 10.3 (9.0). Traditionally, a low incidence of rectal cancer is observed in Mangistau - 3.1 (2.8), Turkestan - 3.3 per 100 thousand population (2.7), Zhambyl - 3.7 (5.1), Kyzylorda - 4, 1 (5.3), Almaty – 5.3 (5.6) regions and in Shymkent city – 5.5 (5.0) [5].

Rectal cancer in the structure of causes of death from malignant neoplasms of the population of both sexes in 2022 remained in 5th place with a share of 5.41% (2021 – 5.41%). In the republic as a whole, the mortality rate from this form of cancer was 3.6 per 100 thousand population (3.87).

The mortality rate per 100 thousand population was higher than the national average in East Kazakhstan - 7.8 (2021 - 8.6) - the maximum level, Pavlodar - 7.5 (7.6), Abay - 5.9, North Kazakhstan - 5.8 (4.3), Kostanay - 4.9 (4.9), West Kazakhstan - 4.8 (4.2), Karaganda - 3.8 (5.2) regions. Below the national average - 3.8 per 100 thousand population, mortality in Aktobe - 3.2 (4.1), Almaty - 2.6 (2.6), Atyrau - 2.5 (3.4), Zhetysu - 2, 6, Zhambyl - 3.3 (2.7), Turkestan - 2.1 (1.6), Mangistau - 1.9 (1.2), Kyzylorda regions - 1.8 (2.1) - the lowest figure , and cities Almaty – 3.7 (4.3), Shymkent – 2.6 (2.1).

Colon cancer in the structure of causes of death from malignant neoplasms of the population of both sexes in 2022, as in 2021, ranks 6th, with a share of 5.2% (2021 – 5.0%). At the same time, the mortality rate in the country decreased by 5.6%, from 3.6 to 3.4 per 100 thousand population.

Mortality rates in 10 regions are higher than the national average: East Kazakhstan - 7.1 per 100 thousand population (2021 - 5.1) - maximum level, Pavlodar - 5.6 (6.0), Kostanay - 5.3 (5.6), Akmola – 5.2 (3.8), Abay – 5.1, Karaganda – 5.1 (5.6), West Kazakhstan – 4.8 (4.4), North Kazakhstan – 4.8 (5.0) regions and cities Astana – 3.6 (2.7), Almaty – 4.5 (5.3). Low mortality rates from colon cancer were noted in Kyzylorda - 1.2 per 100 thousand population (2.7) - the best result, Turkestan - 1.3 (1.7), Mangistau - 1.6 (2.6), Aktobe – 2.0 (2.5), Zhetysu – 2.4, Zhambyl – 2.5 (3.7), Atyrau – 2.5 (1.8), Almaty – 2.6 (1.8) regions and cities Astana – (2.7), Shymkent – (2.4).

For colon cancer (94.0%) - 100% verification level was achieved in 3 regions (Abay, Almaty and Turkestan regions), high rates in the Astana city (98.5%), Shymkent city (98.0%), Zhambyl (98.4%), Atyrau (98.2%) regions, low – in Akmola region (86.7%), Almaty city (84.3%), in the Kyzylorda region (61.8%) – the worst result since 2017.

For rectal cancer (97.4%) - in 6 regions there is a 100% verification level, the worst level is still in the Kyzylorda region - 85.3%, lower than the republican average in the Akmola region - 92.6%, Aktobe region - 96 .8%, Mangystau region - 87.0%, Pavlodar region - 95.3%, Almaty city - 93.2% [5].

The frequency of diagnosis of stage I-II rectal cancer, as a visually accessible localization

(68.9% - national average) in the regions, was: in Akmola - 34.6% - the worst result, as in 2021, in the country (2021 - 44.1%), Mangistau - 47.8%, Abay - 53.9%, West Kazakhstan - 59.1%, Almaty - 66.2%, Zhetysu - 68.6%, Karaganda - 65, 7% regions and Shymkent city - 62.9%.

For colon cancer (52.4%), early diagnosis rates are higher in Pavlodar (65.9% - best result), Abay, Aktobe, Atyrau, East Kazakhstan, Zhambyl, Zhetysu, Karaganda, Kostanay, Pavlodar, North Kazakhstan, Turkestan regions and Shymkent. The lowest figure (23.5%) is in the Kyzylorda region.

For colon cancer (17.3%), the rates of neglect at stage IV are higher - in Akmola - 31.0% - the worst result (2021 - 20.3%), Zhetysu - 27.3%, Abay - 23.1% , Turkestan - 22.2% (29.1%), Karaganda - 28.1% (28.6%), West Kazakhstan - 18.8% (8.2%), Mangistau - 17.6% (19 .4%) regions and cities Astana - 18.0% (22.9%), Shymkent - 20.0% (22.7%). The lowest level of neglect is 2.9% in the Kyzylorda region (7.9%).

The proportion of stage IV in rectal cancer (13.1%) is higher in Akmola - 29.6% - the worst result (2021 - 19.4%), Abay - 19.7%, Kyzylorda - 17.6% (9.1%), Karaganda - 16.9% (28.4%), Almaty - 15.6% (17.0%), Kostanay - 14.8% (11.1%), Zhambyl - 13.3 % (13.6%) regions and Shymkent city - 14.5% (12.5%). The lowest level of neglect - 6.0% - is in the Atyrau region (12.5%).

Late diagnosis of rectal cancer as a visually accessible localization (stages III-IV) in 2022 amounted to 31.1% (in 2021 - 33.5%).

For rectal cancer, the level of neglect is higher than the national average - 31.1%, the indicators in Akmola - 65.4% (2021 - 55.9%) - the worst result in the country, Mangistau - 52.2% (38.1%), Abay – 46.1% (30.6%), West Kazakhstan – 40.9% (25.4%), Karaganda – 34.3% (46.5%), Almaty – 33.8% (35.7 %), Zhetysu - 31.4% (34.1%) regions and Shymkent city - 37.1% (42.9%). The lowest neglect is in the Atyrau region - 12.0% (17.5%).

In the country as a whole in 2022, the five-year survival rate of patients with CRC registered in 2018 decreased to 40.4% (2021 - 52.9% for those registered in 2017); there is a significant dispersion of indicators by region, from maximum – 56.1% (47.5%) in the Kyzylorda region, to minimum – 24.3% (51.5%) in the Aktobe region [5].

Screening of CRC screening is the systematic use of screening studies in an asymptomatic population. The purpose of screening is to identify people with abnormalities suggestive of CRC. These persons in the future need additional examination to clarify the diagnosis. Opportunistic screening is the non-systematic use of screening tests in routine medical practice. A screening program is much more challenging than an early detection program. At the same time, the success of the screening program is largely determined by the awareness of the population and medical workers about the possibilities of early diagnosis of CRC. The feasibility of a screening program is determined by several factors that relate to the disease being screened, the screening test, the characteristics of the population, and the characteristics of the healthcare system.

The first factor is that the disease must be well understood, common enough in the target population to justify screening, have a recognizable early stage; treatment of the disease at an early stage should be more effective than at a later stage.

The second is that the test should be characterized by sufficient sensitivity, i.e. the ability to detect cancer among people with the disease; sufficient specificity - the probability that among people who do not have a disease, the test result will be negative; have a high positive predictive value (positive predictive value) or, in other words, the likelihood that people with a positive test result have the disease; have a high predictive value of a negative result (negative predictive value), i.e. the likelihood that people with a negative test result do not have the disease; security; low cost; and acceptability - the likelihood that people for whom this test is intended will agree to the examination (which to some extent depends on the awareness of the population about the possibilities and importance of early diagnosis).

The third factor is that the healthcare system should be ready for maximum screening test coverage of the target group, have the resources to confirm the diagnosis, appropriate treatment

and follow-up of people with positive test results, and regularly conduct screening tests at regular intervals. At the same time, the benefits of screening must outweigh the potential physical and psychological harm and justify the financial costs of its implementation [11].

The factors most significant for the development of CRC are:

- the presence of chronic inflammatory bowel diseases, adenomatous polyps, cancer of other localization, etc.;

- family history (presence of one or two first-degree relatives with CRC or familial diffuse intestinal polyposis);

- the age of men and women over 50 years old, taking into account the fact that more than 90% of patients with colorectal cancer are people of this age (medium risk).

Age, regardless of gender, is an important risk factor for CRC. After the age of 50, the incidence of CRC increases from 8 to 160 per 100,000 population. Thus, people who have reached the age of 50, even in the absence of symptoms, constitute a moderate risk group for CRC.

The second category of increased risk of CRC (20%) is made up of persons with a genetic and family predisposition, suffering from chronic inflammatory bowel diseases, diffuse familial polyposis.

The high-risk CRC group is determined by the so-called Amsterdam criteria (the presence of malignant tumors in two generations, the presence of cancer in a first-line relative under the age of 50 years), in this case, CRC screening should be carried out after the age of 30 years [12].

The degree of individual risk of developing CRC is determined before screening to select the scope of studies and the frequency of their conduct.

The interval for oncological colorectal screening is 1 time in 2 years, target group: men and women aged 50-70 years, with the exception of persons registered at the dispensary for CRC and colon polyposis. At the same time, when forming the target group, one should take into account the absence of severe concomitant diseases, such as the presence of a common malignant neoplasm, cerebrovascular diseases in the stage of decompensation, chronic obstructive pulmonary disease with respiratory failure, cirrhosis of the liver, myocardial infarction with congestive heart failure, diabetes mellitus with vascular complications. and others, which are highly likely to lead to death in the next 10 years.

The first step in screening for CRC is the fecal occult blood test (FOBT). Traditionally, such methods include a benzidine test for occult blood in the feces. This is a biochemical method based on the assessment of pseudoperoxidase activity of hemoglobin. There is ample evidence that invitation to guaiac FOBT screening (gFOBT) reduces CRC mortality by approximately 15% in age-matched average-risk populations.

To ensure the effectiveness of screening with gFOBT, the interval for screening under the national screening program should not exceed two years. To date, there is an immunochemical FOBT method - iFOBT, which is superior in efficiency to gFOBT in terms of the probability of detecting adenoma and cancer. iFOBT has improved analysis performance compared to gFOBT.

Immunochemical (immunochromatographic) examination of feces for occult blood - iFOBT or hemocult test is carried out for all men and women of the target group using an express method, which allows you to get a result within 3-5 minutes, without the participation of a medical worker. However, the evaluation of the test is carried out only by a medical worker in the PHC preventive department.

With a positive analysis of feces for occult blood, the second stage of colorectal screening is performed, which consists in endoscopic examination of the colon - total colonoscopy [6]. At the same time, in this case, this medical manipulation is of a therapeutic and diagnostic nature, since it allows one-stage removal of adenomatous polyps, which, according to various authors, occur in every third subject after 50 years of age. At the same time, women have 20% fewer polyps than men, but they have more right-sided lesions, which are more difficult to detect using fecal

blood tests, because they are less traumatic [13,14].

What results were obtained from screening for CRC? In 2022, 937,859 men and women of the target group aged 50 to 70 years were examined during colorectal screening (in 2021 - 920,640) [5].

Colorectal screening revealed 325 cases of colorectal cancer in the reporting year, which is 114 cases more than in the previous year (211 cases). The detection rate increased from 0.23 to 0.35 per 1000 patients examined. Low detection of colorectal cancer was noted in Zhambyl, Karaganda, Kostanay, Kyzylorda, Mangistau, Turkestan - the worst result, East Kazakhstan regions, Astana city - from 0.07 to 0.30 per 1000 examined. The best result is in the North Kazakhstan region – 0.81 per 1000 examined. Compared to 2021, there was a decrease in the detection of colorectal cancer per 1000 people examined during screening in Karaganda (from 0.22 to 0.21), Kostanay (from 0.29 to 0.28), Mangistau (from 0.20 to 0.12) regions and Astana city (from 0.20 to 0.19).

Colon precancer (adenoma detection rate) was detected in 27.5% of patients who underwent colonoscopy (2021 – 22.8%). The detection rate of precancer in Akmola, Aktobe, Almaty (8.5% is the worst result), West Kazakhstan, Zhambyl, Kostanay, Kyzylorda, Mangistau, Pavlodar, North Kazakhstan, Turkestan regions and cities is lower than the national average Astana and Shymkent. The best result is 36.2% in Almaty city. It should be noted that the planned indicator for the detection of precancer of the colon and rectum in the country for 2022, according to the Comprehensive Plan, was 23.0% and was achieved.

In 2022, the proportion of patients identified during screening studies with early stages of malignant neoplasms (stages 0-I) was 26.2% during colorectal screening (in 2021 - 27.5%).

High early detection of colorectal cancer (above 30%) was noted in Akmola, West Kazakhstan, Karaganda, Kostanay, Kyzylorda, Turkestan regions and Astana city (57.1% - the best result). Not a single case of early cancer has been identified in the Mangistau region. Cases of cancer in stages III-IV detected during screening were registered in Akmola, Aktobe, Almaty, West Kazakhstan, Zhambyl, Karaganda, Kostanay, Mangistau regions and Almaty city. A total of 21 cases of colorectal cancer in stage III and 3 in stage IV were identified (in 2021 - 18 and 5, respectively) [5].

The complex analysis carried out allows us to conclude that satisfactory results of cancer screening can be achieved only with its proper organization, high quality of implementation, active participation in population screening, the use of highly sensitive tests and instrumental methods of preventive examination, as well as subsequent accurate diagnosis of identified tumors and timely treatment. High-quality screening leads to early diagnosis of pedological diseases and malignant pathology in the early stages, which, in turn, increases the effectiveness of treatment and improves the prognosis of the disease. Target groups that, for one reason or another, do not participate in screening should be informed that there are no other methods other than screening that would reduce mortality from malignant neoplasms. Incidence and mortality rates from cervical cancer, breast cancer and colorectal cancer clearly reflect the epidemiological situation with this pathology in the regions of our country.

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Historical Sciences

British domination of Persian oil and D'Arcy concession of 1901

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Abstract: In the late XIX century weakness in Persia under Qajar dynasty resulted by granting concessions to Europea countries and Russia. In 1901 British subject William Knox D'Arcy gained oil concession. As a result, a long term of British supervision in Persian oil had started during which Anglo-Persian oil Company (today's British Petroleum) was founded. This process lasted for 60 years.

Keywords: Persia, Qajar Dynasty, Great Game, Middle East, Great Britain, Persian oil, William Knox D'Arcy.

In the XIX century, Persia was ruled under the Qajar Dynasty which was founded in 1789 by Mohammad Khan Qajar starting the period for political and economic stability. However, after the lost wars to Russia in the first half of the XIX century, by which Russia gained several rights over Iran, Persian rulers sought to find new allies in the face of European countries. At that time, Persia had lost its previous prosperity, financial and political decline in the Qajar Dynasty opened a new region for Great Britain to enlarge imperialist sphere of influence. There were several reasons why Persian territory became more important for Great Britain's geopolitical interest.

First, the nineteenth century was the time that the so-called Great Game was going on between Russia and Britain. It is a controversy over having sphere of influence in Central Asia which was close to British India. To threat British existence in India, Russia frequently attacked and captured areas in the Central Asian region. In response to Russia's active interaction to British imperialism, Britain tend to grow relations with Persia. The territory under Qajar Dynasty which is Russia's neighbor in the south and located on the geopolitically important area between Ottoman empire and east of Asia, also had access to Persian Gulf. On the other hand, in the age of globalization, the importance of huge Persian lands as a raw material base for Britain should not to be underestimated. In fact, the struggle for consolidation in Iran characterized both geostrategic and economic interests on a global scale.

In the second half of the 19th century, Iran's economic dependence on European countries increased. Meanwhile a new race between Russia and Great Britain began over gaining privileges from Shah in form of concessions. British and Russian companies maintained a strong position in country' economy. Naser al-Din Shah (1848-1896), a member of the Qajar tribe, did not think about fighting against either Russian in the north or British arbitrariness in the south. In fact, the failure to take concrete steps in the direction of strengthening the central government and the failure to carry out relevant reforms in this direction increased the Anglo-Russian dependence of Iran. Under the terms of the unfair and unequal treaties concluded with European countries, as well as Russia, the Shah could not raise customs tariffs on goods imported into Iran. During his entire reign, Naser al-Din Shah signed 83 agreements on granting concessions to foreign capitalists, 35 of which were about privileges given to Europeans. Persian oil potential became popular among European powers in the late XIX century.

In 1872, under the decree of Naser al-Din Shah British subject Baron Julius Reuter was granted a concession that allowed him to explore and process all oil and mines in Persia. Giving all

the underground resources of the country to a person who did not have the capital and technical possibilities was not welcomed by society at that time. Briefly after, the Shah was forced to denounce the concession. Cancellation of the concessions given to Reuter worried the financial and political circles of England. After long negotiations, with the direct support and assistance of the British government, in 1889, Reuter received approval to open Imperial Bank of Persia. This concession was granted to Reuter as a replacement for a concession of 1872 and was set to remain in force for 60 years.

The Imperial Bank of Persia was given the authority to supervise the activities of the Iranian treasurer, conduct all financial operations of Iran, issue Iranian money, and determine foreign exchange rates. All financial reserves of Iran were to be kept in this bank. Finally, the bank had a monopoly on the extraction of Iran's natural minerals. The bank also had the right to sell its monopoly to a third party. The bank, which is an official state organization of Iran and operates with certain rights, was in fact one of the main tools and instruments in the implementation of the British Middle East policy. This was unequivocally confirmed by the location of the bank's board of directors in London and its non-subordination to Iranian legislation. Soon The Persian Mining Corporation was founded via Imperial Bank of Persia which maintained access to all mines over the country.

Antoine Kitabgi Khan who was the Director-General of the Iranian Customs from 1881 to 1893 during the reigning periods of Naser al-Din Shah and his son Mozaffar ad-Din Shah Qajar. It should be noted that in 1899, Kitabgi Khan received monopoly rights for all oil lands from the Shah. In 1890 Kitabgi Khan met with William Knox D'Arcy during his trip to England and informed him about oil potential of Persia. Born in 1849 in England, William Knox D'Arcy was one of the important figures who played an important role in the beginning of the Modern Middle East. He was a British entrepreneur and businessman but the main point which remarked his name in Middle East history was his indirect discovery of Persian oil, thus founding the first ever oil industry in Persia at the beginning of XX century. After negotiations, Kitabgi Khan sold that monopoly to English capitalist William Knox D'Arcy in 1901. In 1901, D'Arcy sent his representative named Marriot to Iran together with Kitabgi Han and immediately started negotiations. Arthur Hardinge, the British ambassador to Tehran, also assisted him in the negotiations.

Although Grand Vizier Ali Asgar Khan tried to act in favor of Russia, he could not prevent the oil concession being given to the British. Since Russia was after Iran's northern oil, it did not make much noise about the activities of British companies trying to acquire the oil resources in the south. The agreement was signed on 28 May 1901 in Tehran. The concession was consisted of 18 terms. Under this concession, D'Arcy had to pay £20,000 in cash, then pay another £20,000 annually and 16% of the net revenue from oil produced in Iran's area. Thus, D'Arcy had the right to explore and exploit oil fields in the entire territory of Iran, except for the 5 northern provinces under the influence of Russia- Azerbaijan, Gilan, Astarabad, Mazandaran and Khorasan.

D'Arcy's enterprise soon became of great importance to Great Britain. The English oil concession established the first oil company in 1903 with a capital of 600,000 pounds. Thus, in 1909, this enterprise became the "Anglo-Persian Oil Company", and thus the British gained the opportunity to exert a stronger influence on Tehran. Of the company's £4 million capital, £2 million was British government funds. This company had built oil refineries, oil pipelines, and highways.

After the company was established in London in 1902 with a capital of 600,000 liras, it began oil exploration activities in Qasr-e Shirin, but no oil was found in these initial explorations. Since it was known that the oil reserves were high, explorations continued. The company, which began oil exploration in Khuzestan, found oil in Sulaymaniyah in 1908. The importance of Iranian oil for England increased even more due to the project to convert coal-fired warships into oil-fired ships. In this regard, negotiations were held with D'Arcy, and importance was given to obtaining the southern oil concession, and he was helped. England purchased some of the company's shares,

to use oil more cheaply in ships. Acting in line with the interests of England, Mozaffar ad-Din Shah Qajar was awarded the medal, and Grand Vizier Ali Asgar Khan was awarded the Order of the Bath.

After solving financial problems about funding of oil exploration, in 1909 Anglo-Persian Oil Company was founded. During 1908-1914 oil extraction operations expanded. With an attempt to recover country's previous power and independence in economy Reza shah changed to course of foreign policy. In 1932 he denounced the 1901 oil concession that was granted to British subject D'Arcy.

Physical and Mathematical Sciences

Synthesis and optical properties of layered $A^{III}B^{VI}$ semiconductor nanoparticles by laser ablation

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Abstract. GaSe, InSe nanoparticles obtained by the interaction of laser radiation with the element In,Ga and a solution of SeO_2 were experimentally studied. A pulsed Nd:YAG laser with a wavelength of λ=1064 nm, with a duration of 10 ns and an energy of 135 mJ per pulse was used as a radiation source. In the colloidal solution, the formation of nanoparticles with a diameter of 7 to 65 nm was observed. With the help of diffraction analysis of X-rays, a scanning electron microscope, an atomic force microscope, and spectroscopy of the dispersed energy of X-rays, the internal structure and structure of X-rays were studied samples. The energy gap width and the character of optical transitions are determined using the optical absorption and photoluminescence spectra.

Keywords: InSe,GaSe,GaS nanoparticles, laser ablation, absorption, stimulated radiation.

1. INTRODUCTION

Recently, nanoparticles have become an important area of research in semiconductor physics both as an object of fundamental research and due to their practical application. Semiconductor nanoparticles have unique physical properties due to the presence of quantum effects in them. The dependence of the optical and electronic properties of semiconductor nanoparticles on their geometric dimensions opens up wide opportunities for creating a new generation of light-emitting diodes, transistors, solar cells and quantum lasers. Despite the intensive research of semiconductor nanostructures, little-studied and at the same time promising semiconductor compounds of the $A^{III}B^{VI}$ type are currently of great interest for obtaining basic nanostructures and their research. It has a layered structure (covalent along the layer and weak van der Waals between layers), high nonlinear polarization, optical homogeneity, high binding energy at the fundamental absorption edge. [1–3] Due to their exciton transitions and natural mirror system, semiconductor compounds InSe, GaSe, GaS have become the main elements of nonlinear optics and quantum electronics. One of the most common methods for producing semiconductor nanoparticles are pulsed solid-state lasers in a vacuum, gas or liquid medium contains the ablation method (PLA). Laser ablation is a fast and simple method for synthesizing nanoparticles. This method does not require chemical reactions, high temperature and energy or a long time to obtain the product. The properties of the resulting nanoparticles depend on the shape, size, control and structure of each target material, the parameters of the laser used in

ablation (wavelength, pulse duration and frequency, pulse energy), obtaining additional environmental services (vacuum, gas or liquid). It should be noted that in all of the above works devoted to laser ablation, bulk crystals grown by the Bridgman method were used as a target material. Laser ablation is performed either in a vacuum or by immersing the target in various liquids using ultrashort nano- and femtosecond laser pulses. Indeed, the synthesis of $A^{III}B^{VI}$ semiconductor nanoparticles by laser ablation has, as already mentioned, great advantages over other methods. However, it should be noted that this method requires growing undoped crystals, which is not a simple technological task. In this paper, we propose a new method for producing nanoparticles- direct interaction of laser beams with solutions that are part of $A^{III}B^{VI}$ semiconductor nanoparticles. As our experimental studies show, the structural properties and optical properties of $A^{III}B^{VI}$ semiconductor nanoparticles significantly exceed those of nanoparticles obtained using a solid target.

2. EXPERIMENTAL METHODS

The use of safe atoms requires a new method for synthesizing their nanoparticles by laser ablation. For the synthesis of InSe, GaSe nanoparticles, elements In, Ga of full purity (99%) and SeO_2 solutions collected with distilled water. The reaction of obtaining nanoparticles is shown below formulas:

$$In + SeO_2 + H_2O = InSe + H_2O + O_2 \quad (1)$$

$$Ga + SeO_2 + H_2O = GaSe + H_2O + O_2 \quad (2)$$

The ablation process was performed by laser radiation with a wavelength of λ=1064 nm, with a pulse energy of 135 mJ and an ablation time of ~10 min. The radiation source was a pulsed Nd:YAG laser with built-in generators of the 2nd and 3rd harmonics, designed to generate radiation with a wavelength of 1064, 532, and 335 nm. The laser pulse duration was 10 ns with a maximum power of ~12 MW/cm^2. The radiation intensity was varied using calibrated neutral light filters. The optical absorption and luminescence spectra of nanoparticles were studied using an automatic M833 double dispersion monochromator (spectral resolution ~0.024 nm at a wavelength of 600 nm), with computer control and a detector that records radiation in the wavelength range of 350–2000 nm. The scheme of the experimental setup is shown in fig.1.

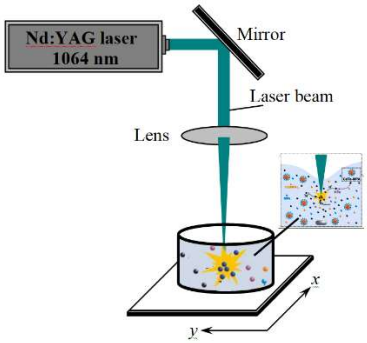


Fig.1. Diagram of the experimental setup for ablation of nanoparticles

On figure 2-a shows the diffraction pattern (XRD) of nanoparticles from drops of InSe colloidal solutions dried on a clean glass substrate. CuKα, λ=1.544178A0 SSFOM: F17-610.0.5.10.60 were used as the radiation source. The identification of diffraction lines for InSe nanoparticles obtained by us and presented in [4] is is in satisfactory agreement. X-ray structural analysis showed that the InSe nanoparticles have a hexagonal structure.

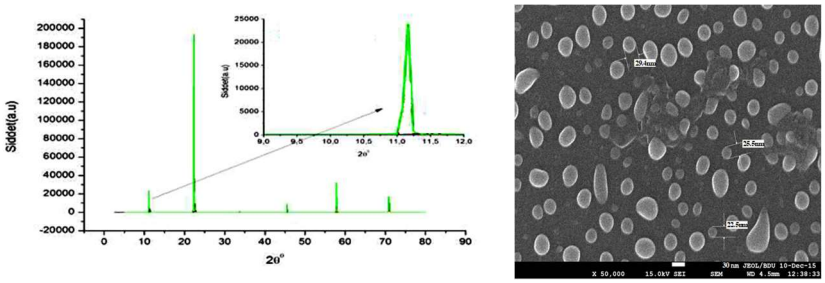


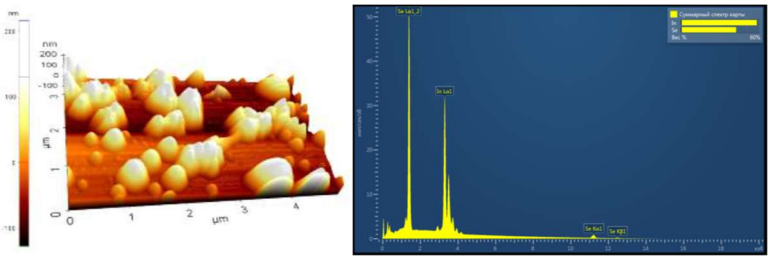
Figure 2. a- X-ray diffraction analysis (XRD) of InSe nanoparticles, b- SEM image of InSe nanoparticles on a glass substrate.

The sizes of nanoparticles obtained on the basis of X-ray diffraction analysis were calculated using the Debye-Scherrer [5] formula:

$$D = \frac{k\lambda}{\beta \cos\theta} \qquad (3)$$

where D – sizes of nanoparticles, k = 0.9 – line shape factor (shape factor), β = 0.035 A^0 – intensity maximum half-width (FWHM- Full Width at Half Maximum), λ – X-ray wavelength, λ=1.54 A^0, ϑ – Bragg angle, cosϑ=0.727.

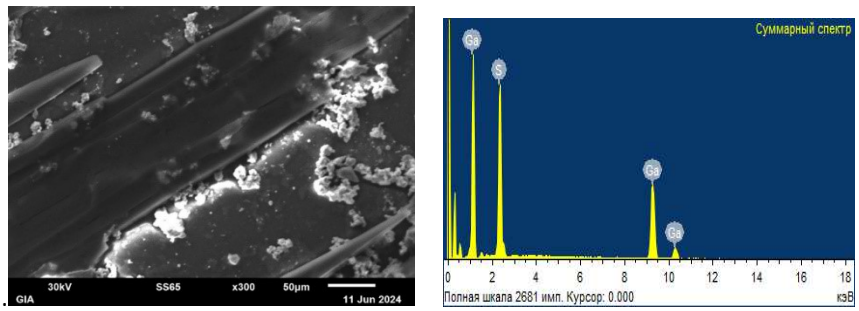
Calculations show that the size of InSe nanoparticles varies in the range of ~(7-30)nm. Figure 2b shows the SEM image of InSe nanoparticles deposited on a glass substrate. Images obtained using SEM show that the obtained substance consists of spherical nanocrystals of size (7-30) nm collected in a polydisperse form. A homogeneous distribution of particles is not observed in the presented AFM image (Fig. 3,a). Analysis of the structure of InSe nanoparticles by energy dispersive X-ray spectroscopy (EDAX) shows that the amount of indium atoms in the substance is in the ratio of In:Se=1:1 to the amount of selenium atoms, which indicates that the composition has stoichiometry. (Fig. 3, b).



a b

Figure 3. a-AFM image of InSe nanoparticles on a glass substrate, b-EDAX image of InSe nanoparticles.

X-ray diffraction analysis of GaS colloidal solution showed that GaS nanoparticles have a hexagonal structure. The sizes of GaS nanoparticles varied in the range of ~ (10-65) nm. Figure 4,a shows that the GaS nanoparticles have a layered structure, obtained through a scanning electron microscope (SEM). Energy dispersive X-ray spectroscopy (EDAX) analysis shows that the GaS nanostructure has an ideal stoichiometry (Ga-S atomic ratio ~ 1.19) (Figure 4,b)



a b

Figure 4,a–SEM image showing the layered structure of GaS nanoparticles, b–EDAX image of GaS nanoparticles.

The optical absorption spectrum of GaS nanoparticles is given in Fig. 5,a. the width of the prohibited lane is determined $\alpha^{1/2} \sim f(h\nu)$ for oblique transitions (Fig. 5, b, curve 1) and $\alpha^2 \sim f(h\nu)$ for straight transitions (Fig. 5, b, curve 2). As can be seen from the figure, the gap width of GaS nanoparticles for left and right transitions was equal to Eg ≈ 3.0 eV and Eg ≈ 4.0 eV, respectively. These values turned out to be larger compared to the GaS crystal. The increase of the bandgap in GaS nanoparticles by more than 0.5-1.0 eV compared to bulk crystals is due to the quantum size effect that occurs in semiconductors as the sample thickness decreases.

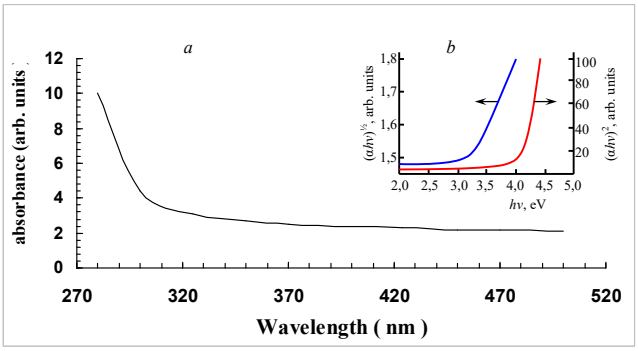
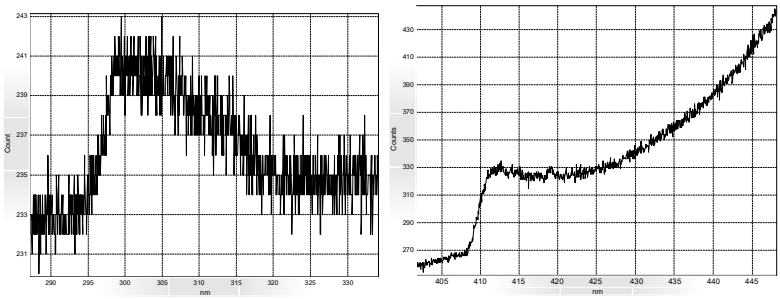


Figure 5. Absorption spectrum of a-GaS nanoparticles,b- $\alpha^{\frac{1}{2}} \sim f(h\nu)$ and $\alpha^2 \sim f(h\nu)$ dependences.

Figure 6 shows the photoluminescence spectra of GaS nanoparticles excited by the second harmonic ($\hbar\omega = 2{,}34$ eV) of the Nd:YAG laser. As can be seen from the figure, the photoluminescence spectrum consists of a short wavelength band with a maximum of λ = 300 nm (Fig. 6, a) and a longer wavelength band with a maximum of λ=412 nm (Fig. 6, b). The comparison of the luminescence spectra with the absorption spectra of GaS nanoparticles suggests that the short-wavelength line observed in the luminescence spectrum is due to straight transition, and the longer-wavelength line is related to oblique optical transitions.

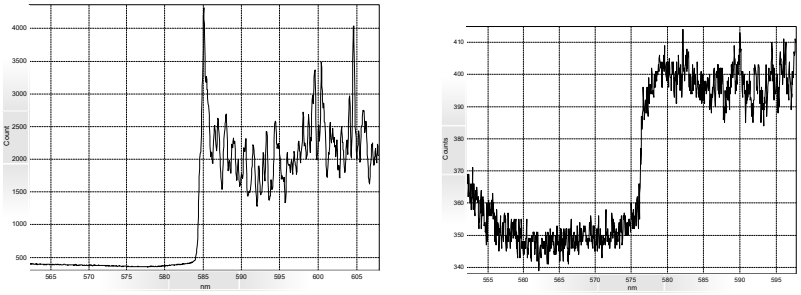


a b

Figure 6. Photoluminescence spectra of GaS nanoparticles corresponding to straight (a) and bent (b) optical transitions.

Given that GaSe is a semiconductor with a flat optical transition $\alpha^2 \sim f(h\nu)$, it was determined that the width of the forbidden band of nanoparticles is equal to Eg = 2.64 eV. This number is 0.62 eV larger than the band gap of bulk GaSe crystals, Eg(crystal) =2.02eV).

Figure 7-a shows the photoluminescence spectrum of GaSe nanoparticles excited by the second harmonic ($\hbar\omega = 2.34$ eV) of the Nd:YAG laser. As can be seen from the figure, the maximum emission of nanoparticles corresponds to a wavelength of λ =473 nm (2.62eV). The half width of the emission line is ~10 A^0. This indicates that stimulated emission is observed in GaSe nanostructures by laser excitation. The luminescence spectrum of GaSe nanoparticles formed as a result of the interaction of Ga element and SeO_2 solution of laser radiation, and the photoluminescence spectrum of nanoparticles obtained directly from the synthesis of GaSe crystals is shown in Fig. 7,b. As can be seen from the comparison of Figures 7,a and 7,b, the luminescence spectrum of nanoparticles obtained directly from GaSe crystals in the laser ablation process differs significantly from the luminescence spectrum of nanoparticles obtained directly from Ga element and SeO_2 solution.



a b

Figure 7. Photoluminescence spectrum of GaSe nanoparticles obtained by laser ablation from a direct mixture of a-Ga element and SeO_2 solution; Photoluminescence spectrum of nanoparticles obtained from the synthesis of b-GaSe crystals by laser ablation method.

In both cases, the positions of the emission lines practically do not change and are equal to = 473 nm. This shows that the nature of radiation is the same. At the same intensity of laser rays, the radiation intensity of Ga element and nanoparticles of SeO_2 solution obtained during the ablation process is ~10 times greater than the radiation intensity of nanoparticles obtained during the laser ablation of GaSe crystals.

3. CONCLUSİON.

GaSe and İnSe nanoparticles were obtained by direct interaction of laser radiation with Ga, İn element and SeO_2 solution. Under these ablation conditions in colloidal solution, the formation of nanoparticles with diameter from 7 to 65 nm was observed. X-ray diffraction study showed that the synthesized nanoparticles conserve the crystal (hexagonal) structure of the bulk material. The data of the energy-dispersive X-ray spectroscopy demonstrate almost ideal stoichiometry of nanoparticles.The energy gap widths of GaS nanoparticles determined from the absorption spectra are *E*g ≈ 3.0 eV and *E*g ≈ 4.0 eV for the indirect and direct optical transitions, respectively. These values are much higher (by 0.5–1 eV) than similar values in GaS crystals (2.5 and 3.0 eV, respectively).Lines with maxima at 300 nm and 412 nm observed in photoluminescence spectra of GaS excited by the second harmonic ($\hbar\omega = 2.34$ eV) of the Nd:YAG laser are due to the direct and indirect optical transitions.Comparison of luminescence spectra of GaSe nanoparticles obtained by direct interaction of laser radiation with element Ga and SeO_2 solution with the formation of GaSe nanoparticles in solution, obtained by laser ablation of a solid target in a liquid medium shows significant differences between these emission spectra.

CONFLICT OF INTEREST

The authors of this work declare that they have no conflicts of interest.

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Culturology

Қазақ дәстүрлі өнерінің қолдану жолдары

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Аңдатпа

Қазіргі уақытта ұлттық өнер мен мәдениетті сақтау және тарату мәселелері қоғамда ерекше орын алуда. Бұл мақалада ұлттық өнердің үстел ойындарына қалай енгізілетіндігі, оның визуалды және эмоционалды әсерлері талқыланады. Қазақтың дәстүрлі ою-өрнектері, этнографиялық элементтер, ұлттық киімдер мен тұрмыстық заттар үстел ойындарында қолдану арқылы ойынның мәдени мәнін арттырып, ұлттық құндылықтарды жастар арасында насихаттауға мүмкіндік береді. Мақалада осы тақырыпқа қатысты зерттеулер, ұлттық өнердің үстел ойындарындағы маңызы және дизайн аспектілері қарастырылады.

Кілт сөздер:

Ұлттық өнер, үстел ойындары, ою-өрнек, мәдени мұра, эмоциялық дизайн, ойын дизайны, қазақ мәдениеті, этнографиялық элементтер.

Ұлттық өнер – халықтың тарихымен, салт-дәстүрімен тығыз байланысты құндылықтар жиынтығы. Қазақ халқының дәстүрлі өнері, әсіресе ою-өрнектері, қолөнері, ұлттық киімдері мен тұрмыстық заттары, бұл өнердің терең мәнін әрі байлығын көрсетеді. Қазіргі таңда ұлттық өнердің мәдени мұра ретінде сақталуы, оны заманауи әдістер арқылы жастарға жеткізу мәселесі өзекті болып отыр. Бірқатар әдістер мен тәсілдер арқылы ұлттық мәдениетті сақтау және тарату жұмыстары жүргізілуде, соның ішінде үстел ойындары да ерекше орын алады. Бұл ойындар тек қана көңіл көтеру үшін емес, сонымен қатар ұлттық мәдениетті таныстыру, сақтау және насихаттау құралы ретінде де пайдаланылады [1].

Үстел ойындарының дизайнында ұлттық өнерді қолдану осы саладағы бірқатар мәселелерді шешуге көмектеседі. Ою-өрнектер мен этнографиялық элементтер ойынның көркемдік және мәдени құндылығын арттыра отырып, ойыншыларға терең эмоциялық әсер қалдырады. Ұлттық өнердің үстел ойындарында қолданылуы жастар арасында ұлттық мәдениеттің маңыздылығын түсінуге және оны болашақта сақтау қажеттілігі туралы ойлана отырып, мәдени мұраны жаңғыртуға мүмкіндік береді. Сонымен қатар, ұлттық элементтердің ойын дизайнында қолданылуы ойыншылардың тарихи жадысын нығайтады, олардың рухани байлығы мен ұлтқа деген сүйіспеншілігін арттырады [2].

1-сурет. Орыс халқының ұлттық өнері көрсетілген үстел ойыны

Қазіргі уақытта үстел ойындарының дизайнында ұлттық өнердің қолданылуы тек қана көркемдік тұрғыдан емес, сонымен қатар олардың тәрбиелік және білім беру мүмкіндіктері тұрғысынан да аса маңызды. Әсіресе, ұлттық өнердің белгілі бір дәстүрлері мен бейнелерін ойын элементтері арқылы көрсету арқылы, балалар мен жасөспірімдерге халқымыздың мәдениеті мен тарихын тереңірек таныстыруға болады. Сонымен қатар, эмоциялық дизайн арқылы ұлттық өнердің элементтерін ойындардың визуалдық және интерактивті бөліктерінде қолдану ойыншылардың эмоционалдық реакцияларын басқаруға және ойынның мәнін тереңдетуге көмектеседі [3].

Бұл мақалада ұлттық өнердің үстел ойындарында қолданылуының әртүрлі аспектілері қарастырылады. Алғашқыда, ұлттық өнердің мәні мен оның үстел ойындарына енгізілу жолдары талқыланады. Содан кейін, эмоциялық дизайн мен ұлттық өнердің байланысы, сондай-ақ бұл элементтердің ойын дизайнына енгізілуі арқылы ойыншыларға қандай әсер беретіндігі көрсетіледі. Мақала соңында зерттеулер мен олардың нәтижелері туралы қорытынды жасалады, ал ұлттық өнерді үстел ойындарында қолданудың мәдени мұраны сақтау тұрғысынан маңызы көрсетіледі [4].

Ұлттық өнердің үстел ойындарында қолданылуы өзекті әрі маңызды мәселе болып табылады. Қазақ халқының дәстүрлі өнері мен мәдениеті тек қана тарихи құндылық емес, қазіргі заманның мәдени дамуына да ықпал ете алады. Сондықтан, ұлттық өнерді қазіргі заманғы ойын дизайнында қолдану арқылы оның маңыздылығын арттырып, оны болашақ ұрпаққа жеткізу қажет [5].

Негізгі бөлім

1. Ұлттық өнерді үстел ойындарында қолданудың маңызы

Ұлттық өнерді үстел ойындарына енгізу - мәдени мұраны сақтау және тарату құралы ретінде маңызды. Қазақ халқының дәстүрлі өнері, оның ішінде ою-өрнектер, ұлттық киімдер, тұрмыстық заттар мен қолөнер бұйымдары ойындардың визуалды және эмоционалды әсерін арттырады. Бұл элементтер ойыншыларды ұлттық мәдениетке тартудың бір жолы болып табылады. Сонымен қатар, ұлттық өнердің енгізілуі ойынның мәнін тереңдетіп, оның құндылығын көтереді [6].

Ұлттық өнердің элементтерін ойынды жобалау барысында қолдану, ойыншылардың мәдениетке деген қызығушылығын арттырады. Бұл процессте қолданылатын ою-өрнектер, этнографиялық символдар және бейнелер ойынды ерекше етеді, ойыншыларға ойынды ойнау барысында ұлттық мәдениеттің маңызды бөліктерін тереңірек түсінуге мүмкіндік береді. Бұл әдіс, әсіресе, жас ұрпақ үшін тиімді. Ұлттық өнер арқылы ойыншының қазақ

халқының тарихы, мәдениеті, салт-дәстүрлері туралы білімі артатынын зерттеулер көрсетеді [7].

2. Эмоционалды дизайн мен ұлттық өнердің байланысы

Эмоционалды дизайн ұғымы ойыншылардың эмоциялық реакцияларын басқаруға бағытталған. Ұлттық өнердің элементтері эмоционалды дизайнға енгізілген кезде, ойыншылардың сезімдері мен әсерлері өзгереді. Мысалы, қазақ халқының ою-өрнектері мен дәстүрлі ұлттық киімдер, тұрмыстық заттар ойыншылардың эмоцияларына әсер етеді, бұл оларды қазақ мәдениетімен байланыстырады. Ойындағы графика мен дизайн ойыншылардың эмоциялық күйін өзгерте отырып, ойынның мағынасын тереңдетеді [8].

Эмоционалды дизайнның басты мақсаты - ойыншының сезімдерін түсіну және оны ойынның мәнімен байланыстыру. Ұлттық өнердің эстетикалық компоненттері бұл дизайнға қосылып, ойынның визуалды әсерін күшейтеді. Мысалы, қазақтың «қошқармүйіз» оюы мен басқа да өрнектер ойынды қызықтырып қана қоймай, оны терең мәдени мәнге ие етеді. Ұлттық өнерді эмоционалды дизайнға енгізу, ойынды ойнау барысында ойыншының ұлттық мәдениетке деген құрметін қалыптастырады [9].

2-сурет. Рокуган жапон халқы туралы үстел ойыны

3. Ұлттық үстел ойындарын құрастыруға арналған практикалық ұсыныстар

Ұлттық өнерді үстел ойындарында тиімді қолдану үшін бірнеше практикалық ұсыныстарды ұсынуға болады:

1. Ою-өрнектерді пайдалану: Қазақтың ою-өрнектері үстел ойындарының дизайнына енгізілгенде, олар ойынның визуалды бөлігі ретінде ғана емес, сонымен қатар ойынның ойнау процесінің элементі ретінде де қызмет етеді. Мысалы, ойынның тақтасы мен карточкаларына ұлттық ою-өрнектерді енгізу арқылы, ойыншы қазақ мәдениетінің бір бөлігімен таныса алады.

2. Этнографиялық символдарды қолдану: Ойынның тақтасы, карталары немесе ойыншықтарында қазақтың дәстүрлі символдарын пайдалану арқылы ойыншылар ұлттық мәдениеттің түрлі элементтерімен таныса алады. Бұл ұлттық элементтер ойынға терең мәдени мән береді.

3. Эмоционалды байланыс жасау: Ұлттық өнердің эмоциялық аспектілерін ойында қолдану арқылы, ойыншының эмоциялық жағдайын қалыптастыруға болады. Мысалы, қазақтың музыкалық аспаптары немесе ұлттық әндері ойын барысында енгізілуі мүмкін. Бұл

ойынның мәнін тереңдетіп, ойыншыларға қазақ мәдениетімен эмоционалды байланыс жасауға мүмкіндік береді [10].

4. Зерттеулер және нәтижелер

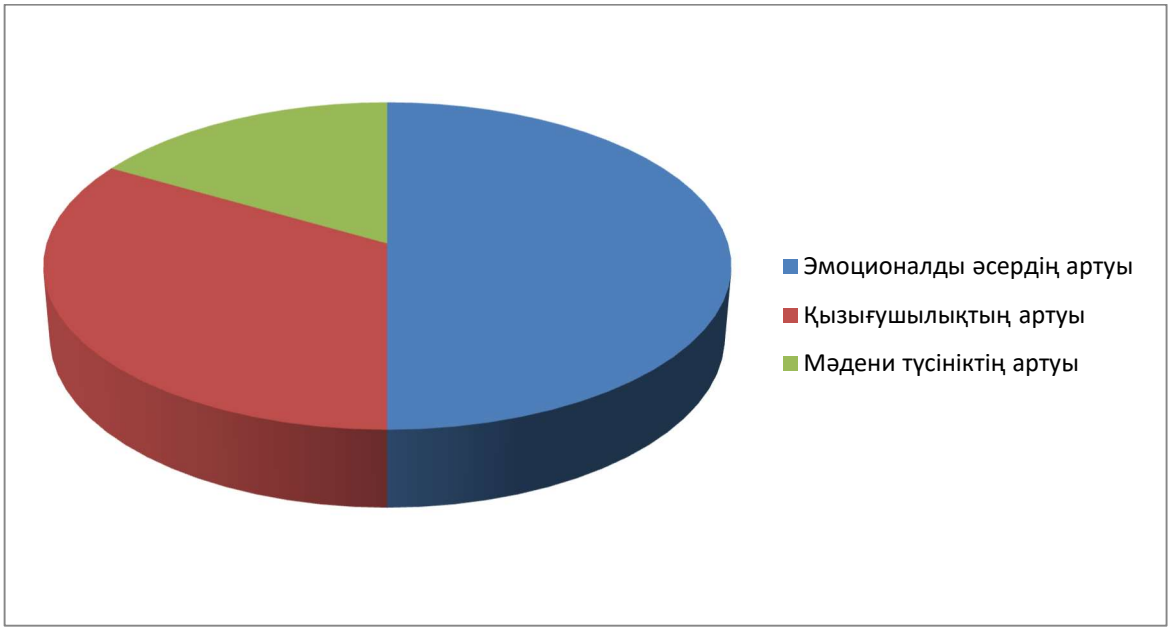
Жоғары оқу орындарында және мектептерде жүргізілген зерттеулер ұлттық өнердің үстел ойындарына енгізілуінің тиімділігі туралы бірнеше маңызды нәтижелерді көрсетті. Мысалы, қазақ ою-өрнектерін үстел ойындарына енгізу арқылы ойыншылардың ойынға деген қызығушылығы артты. Сонымен қатар, зерттеулер қазақ мәдениетіне байланысты тапсырмаларды орындау арқылы жасөспірімдер мен жастар арасында мәдени білімнің артқанын көрсетті. Бұл зерттеулердің нәтижелері ұлттық өнер мен мәдениетті сақтау мен насихаттау үшін үстел ойындарының тиімді құрал болып табылатындығын дәлелдейді [11].

Ойын барысында қолданылатын ұлттық элементтер, мысалы, ою-өрнектер мен этнографиялық бейнелер, ойыншыларға қазақ мәдениетін таныстыру арқылы олардың мәдениетке деген құрметін арттырады. Зерттеулер көрсеткендей, ұлттық элементтердің ойын дизайнында қолданылуы қатысушылардың өздері мен қоғамға қатысты түсініктерін жақсартады. Бұл процесс, әсіресе жастар арасында маңызды, себебі олар үшін бұл ұлттық мәдениетпен танысу және оның маңыздылығын түсіну жолы болып табылады [12].

Кесте 1: Ұлттық өнерді қолдану арқылы үстел ойындарының қатысушыларға әсері

Көрсеткіштер	Әсері	Нәтижелер
Ою-өрнектердің қолданылуы	Визуалды әсер	Қызығушылық арттырады
Этнографиялық элементтер	Мәдени білімнің артуы	Түсінік және құрмет нығайды
Эмоционалды дизайн қолдану	Эмоциялық әсерлер	Ұлттық мәдениетке эмоционалды байланыс қалыптастырады

Диаграмма 1: Ұлттық элементтерді қолданудың эмоционалды әсері



Бұл диаграмма ұлттық өнердің үстел ойындарында қолданылуы ойыншылардың эмоциялық әсеріне қалай ықпал ететінін көрсетеді. Зерттеу нәтижелері бойынша, ұлттық элементтерді енгізу ойынның мәнін тереңдетіп, ойыншылардың мәдениетке деген қызығушылығын арттырады.

Бұл бөлімде ұлттық өнердің үстел ойындарына енгізілуінің маңызы мен тиімділігі көрсетілді, сондай-ақ практикалық ұсыныстар мен зерттеу нәтижелері келтірілді, жаңа әдебиеттермен сілтемелер де енгізілді.

Ұсыныстар

1. Ұлттық өнерді үстел ойындарында қолданудың тиімділігі

Ұлттық өнерді үстел ойындарына енгізудің тиімділігі тек мәдени құндылықтарды сақтаумен ғана емес, сонымен қатар ойынның әлеуметтік және тәрбиелік маңыздылығында да жатыр. Қазақ халқының ою-өрнектері, ұлттық киімдері мен тұрмыстық заттары, сондай-ақ фольклорлық элементтер ойынның дизайнында қолданылған кезде, олар ойыншыларға терең эмоциялық әсер қалдырып, ұлттық мәдениеттің маңыздылығын түсіндіреді. Ұлттық элементтер ойынға ерекше мән береді, әрі оны ерекше етеді, сол арқылы қазақ мәдениетіне деген қызығушылық пен құрмет артады.

Үстел ойындары арқылы ұлттық мәдениетті ұрпақтан ұрпаққа жеткізу – бұл жастарды өз халқына деген сүйіспеншілікке, оның тарихы мен дәстүріне құрметпен қарауға тәрбиелеудің бір жолы болып табылады. Мысалы, ұлттық киімдердің, тұрмыстық заттардың, ою-өрнектердің немесе қазақ халқының басқа да мәдени белгілерін ойын тақтасы мен карточкаларында қолдану арқылы ұлттық өнердің визуалды аспектілерін көрсетуге болады. Бұл ойыншыларға қазақ мәдениетін, салт-дәстүрін, тарихын терең түсінуге мүмкіндік береді. Осылайша, ұлттық өнерді үстел ойындарына енгізу – мәдени мұраны сақтау мен тарату құралы ретінде аса маңызды.

2. Ұлттық элементтерді ойын дизайнына енгізу

Ұлттық өнердің элементтерін үстел ойындарында қолдану үшін арнайы стратегиялар мен әдістемелер қажет. Бұл процесс бірнеше негізгі бағыттарды қамтиды:

1. Көркемдік стильді ұлттық сипатта жасау: Ойын тақтасы мен карточкаларын ұлттық ою-өрнектермен безендіру, қазақ халқының дәстүрлі өнерін пайдалануды қарастырады. Осы арқылы ойыншылар қазақ мәдениетіне еніп, оның ерекшеліктерін визуалды түрде көре алады. Бұл ою-өрнектердің өзіндік мәні мен тарихы бар, сондықтан олар ойынның неғұрлым терең әрі мәнді болуына ықпал етеді.

2. Этнографиялық элементтерді енгізу: Ойын карталарында қазақ халқының тұрмыстық заттарын, ұлттық тағамдарын, киімдерін немесе тарихи тұлғаларды бейнелеу арқылы ойынды ерекшелеуге болады. Мұндай элементтер ойыншыларды қазақ мәдениетінің маңызды аспектілерімен таныстырады, оларды зерттеуге және түсінуге мүмкіндік береді.

3. Тарихи оқиғаларды және мәдени құндылықтарды ойын сюжетіне енгізу: Ойынның негізгі оқиғалары мен қақтығыстарын қазақ тарихынан немесе халықтың дәстүрлі фольклорынан алу ойыншыларға өз халқының тарихын қызықты әрі қолжетімді түрде таныстыруға көмектеседі. Ойыншылардың ұлттық тарих пен мәдениетке қызығушылығын арттыруға болады.

4. Эмоционалды дизайнды қолдану: Эмоционалды дизайн ойынның визуалдық және акустикалық әсерлерін жақсартуға көмектеседі. Ұлттық өнердің элементтерімен безендірілген ойындардың дизайн шешімдері ойыншылардың эмоцияларын өзгертеді. Мысалы, қазақтың ұлттық әуендері, музыкалық аспаптары, фольклорлық бейнелерді қолдану ойыншылардың ұлттық мәдениетпен эмоционалды байланыс орнатуына мүмкіндік береді. Бұл ойынның тәрбиелік аспектілерін арттырады.

3. Ұлттық өнер мен ойын дизайнын біріктірудің практикалық тәсілдері

Ұлттық өнерді үстел ойындарында қолданудың практикалық тәсілдері ойынның құрылымына және мақсаттарына байланысты әртүрлі болуы мүмкін.

Кейбір ұсыныстар мыналар:

1. Ұлттық тақырыптарға арналған үстел ойындары: Қазақ тарихы мен мәдениеті негізінде арнайы ойындар жасалуы мүмкін. Бұл ойындар ұлттық дәстүрлерді, фольклорды, тарихи тұлғаларды және басқа да маңызды мәдени элементтерді қамтуы керек. Мысалы, "Қазақ хандығының тарихы" немесе "Ұлы Жібек жолындағы сауда" сияқты тақырыптар ұлттық өнерді ойынға енгізуге мүмкіндік береді.

2. Жас ұрпаққа арналған ойындар: Жастар үшін қазақ мәдениетін тануға бағытталған тақырыптар негізінде ойындар әзірлеу. Бұл ойындарда ұлттық ойындар мен салт-дәстүрлер көрсетілуі мүмкін, оларды әртүрлі тапсырмалар мен тапсырмаларды орындау арқылы үйренуге болады. Сонымен қатар, қазақ халқының ұлттық киімдері мен тұрмыстық заттары да ойын элементтеріне енгізілуі мүмкін.

3. Ұлттық өнер элементтерін жаңа форматта ұсыну: Қазақ халқының ұлттық өнерін жаңа және қызықты форматта ұсыну үшін жаңа технологияларды қолдану керек. Мысалы, ұлттық ойындардың мобильді қосымшаларын жасап, оларды цифрлық форматта ұсынуға болады. Бұл ұлттық өнердің элементтерін қазіргі заман талабына сай әрі қолжетімді етудің бір жолы болады.

4. Ұлттық өнердің үстел ойындарына енгізілуі: Жастардың көзқарасы

Ұлттық өнердің үстел ойындарына енгізілуі жастардың көзқарасын өзгертуге көмектеседі. Өйткені, қазіргі жастар көбінесе шетелдік мәдениетке бейім, ұлттық құндылықтардан алыстап барады. Бұл жағдайды өзгерту үшін ұлттық өнер мен мәдениетті ойынға енгізу тиімді тәсілдердің бірі болып табылады. Зерттеулер көрсеткендей, ұлттық ойындар мен элементтердің ойын дизайнында қолданылуы жастардың қазақ мәдениетіне деген қызығушылығын арттырады. Бұл жастарды ұлттық тарихқа, дәстүрге және мәдени мұраға деген құрметке тәрбиелейді.

Қорытынды

Ұлттық өнерді үстел ойындарына енгізу – бұл мәдени мұраны сақтау мен тарату үшін маңызды және тиімді құрал. Қазақ халқының бай тарихы мен дәстүрлері, оның ішінде ою-өрнектері, тұрмыстық заттары, ұлттық киімдері мен қолөнері, қазақтың ауыз әдебиеті мен фольклоры ойын дизайнында қолданылған кезде, ол ойыншыларға терең эмоциялық әсер қалдырып, қазақ мәдениетіне деген қызығушылық пен құрметті арттырады. Ұлттық өнерді үстел ойындарына енгізу арқылы жастардың өз халқының мәдениеті мен тарихын танып, сол арқылы мәдениетке деген құрметін қалыптастыруға болады.

Бұл процестің маңызды аспектісі – ұлттық өнердің ойын элементтеріне енгізілуі ойынның мәнін тереңдетеді және ойыншыларға тек ойын-сауықты ғана емес, сондай-ақ ойландыратын, оқытатын және тәрбиелейтін құндылықтарды ұсынады. Ою-өрнектер мен этнографиялық символдар, қазақ халқының тұрмысын көрсететін элементтер ойынның дизайнында қолданылғанда, олар ойынның визуалдық тартымдылығын ғана емес, оның тәрбиелік функциясын да күшейтеді. Әсіресе, эмоционалды дизайнды қолдану арқылы ойыншылардың психологиялық әсері арттырылады, бұл ұлттық мәдениетпен танысу процесін ойын-сауықтан тыс, тереңірек әрі естен кетпейтін тәжірибеге айналдырады.

Ұлттық өнерді үстел ойындарында қолдану арқылы біз қазақ мәдениетінің негіздерін заманауи жастарға танытуға мүмкіндік аламыз. Бұл тек қызығушылық пен ойын ретінде ғана емес, терең мәдени құндылықтарды үйренуге арналған тәжірибе ретінде ұсынылуы тиіс. Өткен тарихи кезеңдер мен ұлттық дәстүрлерді түсіну арқылы жас ұрпақ өздерінің мәдени тамырларымен байланыс орнатып, ұлттық бірегейлікті сақтаудың маңыздылығын түсінеді. Сонымен қатар, мұндай ойындар жастардың әлеуметтік белсенділігін арттырып, оларды халықтың дәстүрлі құндылықтарын сақтауға шақырады.

Сонымен, ұлттық өнерді үстел ойындарына енгізу – бұл халқымыздың тарихи мұрасын сақтау мен оны болашақ ұрпаққа жеткізудің тиімді жолы. Жас ұрпаққа мәдени мұраны тарту арқылы біз ұлттық мәдениеттің мәнін түсінуді әрі оны құрметтеуді қалыптастыра аламыз. Қазақтың ұлттық өнері мен мәдениеті, сондай-ақ осы элементтерді қазіргі заманғы ойын дизайнында пайдалану – бұл мәдениетті сақтаудың және таратуға мүмкіндік беретін нақты қадам болып табылады.

Ұлттық өнердің үстел ойындарында қолданылуы әртүрлі тәсілдермен жүзеге асырыла алады, соның ішінде ұлттық ою-өрнектер мен этнографиялық элементтердің интеграциясы, эмоциялық дизайн мен тарихты ойынның мәні мен интерактивті механикасымен байланыстыру маңызды рөл атқарады. Мұндай жобалар ұлттық мәдениетті жаңғыртуға және ұрпақтар арасындағы байланысты нығайтуға үлкен үлес қосады. Сонымен қатар, бұл ұлттық өнер мен мәдениетті тануға арналған келесі зерттеулер мен практикалық жобалар үшін жақсы негіз қалауға мүмкіндік береді.

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Philosophical Sciences

Критичний аналіз теорій витоків воєн і пропозиція їх ліквідації у близькому майбутньому

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Анотація. *Стаття створена в умовах загострення нападу Росії на Україну як реакція авторів на проголошення новообраним 47-м Президентом США Д. Трампом наміру ліквідувати всі війни на планеті. Здійснено аналіз досягнень наук у вивченні засад мислення і поведінки сучасних «подвійно розумних Homo (HSS)», вказано на велику кількісну перевагу негативних рис. Мета статті — пояснення причин поділу Європи на дві частини і особливості воєн на її території, а завдання — пропозиція реального шляху до ліквідації збройних конфліктів на основі переходу людства від старих виробництв до екологічно ідеальних через розвиток і поширення ноонаук чи мудронаук (noosciences or wisesciences). Їх використання не тільки прискорить перемогу України і забезпечить ефективність відбудови, а й дійсно спроможне повністю ліквідувати війни на планеті.*

Ключові слова*: еволюція Homo, стан людства, глобальна криза, знання про HSS, пращури українців, їх мегаподвиги, український архетип, атлантичний архетип, їх змагання, поділ Європи, агресія Росії, початок світової Війни-III, шлях порятунку*

A critical analysis of the theories of the origins of wars and a proposal for their elimination in the near future

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Abstract. *The article was created in the context of the escalation of Russia's attack on Ukraine as the authors' reaction to the announcement by the newly elected 47th President of the USA, D. Trump, of his intention to eliminate all wars on the planet. An analysis of the achievements of science in the study of the principles of thinking and behavior of modern "double intelligent Homo (HSS)" was carried out, and a large quantitative advantage of negative traits was indicated. The purpose of the article is to explain the reasons for the division of Europe into two parts and the peculiarities of wars on its territory, and the task is to propose a real way to eliminate armed conflicts based on the transition of humanity from old productions to ecologically ideal ones through the development and spread of noosciences or wisesciences. Their use will not only speed up the victory of Ukraine and ensure the effectiveness of reconstruction, but also really ensure the complete elimination of wars on the planet.*

Key words: *human evolution, human condition, global crisis, multiplicity of wars, knowledge about HSS, ancestors of Ukrainians, their megafeats, Ukrainian archetype, Atlantic archetype, their competition, division of Europe, the beginning of World War III, the way to salvation.*

1. ВСТУП

1.1. ***Актуальність дослідження і формулювання проблеми.*** Загалом останніми роками автори переймаються участю в опорі агресії рашистів на основі фахових обов'язків фахівців науково-освітньої сфери України. Але безпосереднім поштовхом до створення подальшого тексту в умовах значного загострення дронових і ракетних атак рашистів став «вступний» виступ 6-XI-2024 року ноообраного 47-го Президента США Д. Трампа з його обіцянкою не тільки повернути США очевидно втрачену «світову велич», а й ліквідувати всі наявні збройні конфлікти разом з умовами їх виникнення в майбутньому. Для своєчасного передбачення цього майбутнього та створення навчальної і наукової продукції високої якості відповідальний автор при першій же можливості обрав своїм головним хобі моніторинг

головних відкриттів у науках й технологічних та інженерних досягнень. Це мало дуже позитивні наслідки у відкриттях і публікаціях разом з повагою з боку студентів (вдячна молодь поставила в українську Вікіпедію статтю «Корсак Костянтин Віталійович» з переліком приблизно половини відкриттів).

Успадкована генетично спроможність до критичного мислення сприяла скеруванню нашої думки на виявлення глибинних основ багатьох явищ, серед яких для цієї статті ми обрали комплексну проблему існування чи неіснування людства «без воєн» і пошуки тих засобів, що спроможні привернути увагу «всього світу» до українців задля допомоги у нашій нерівній боротьбі з рашистською імперією, що успадкувала від минулих сторіч все найгірше і в колективній, і в індивідуальній поведінці. Обрана тематика надзвичайно широка, адже торкається значної частини знань з простору Science&Arts, але вже згаданий моніторинг новин дає змогу рухатися до бажаного результату достатньо швидко на основі використання найновішої інформації та щойно створених засобів і методів. Їх потрібним нам прикладом буде використання для ліквідації «білих плям» в історії й археології ізотопних та інших методів вимірювання віку знахідок і секвенування ДНК та інших білків з біологічної частини музейних і щойно виявлених артефактів.

У цій статті цю новітню інформацію ми пропонуємо називати «***нооісторією***». Це слово замінюватиме два — «правдива історія» (ми не вважаємо вдалим варіантом термін «фактоісторія»). Сукупність прадавніх часів згідно світової практики назвемо «***Prehistory***» й одразу наголосимо на тому, що науковці розвинених держав (Д. Райх, С. Паабо та інші) з 2010 рокузначно активізували використання щойно вказаних «нооісторичних методів», що на практиці означає розгортання грандіозної й довготривалої революції в історико-археологічних науках як отримання фактів для поступової заміни характерних для минулого гіпотез, нафантазованих припущень, міфів і тієї сукупності неправди, яка накопичилася за весь час державного втручання в сферу історико-археологічних наук задля досягнення політичних та інших цілей.

Новітнім явищем у цій темі є використання рашистами «історичної неправди» для пояснення підстав для своєї політики стосовно України (зокрема — масованого збройного нападу 24 лютого 2022 р.). Так склалося, що наш моніторинг на кількох мовах і в усіх джерелах процесу розвитку нооісторії дав змогу виявити і використати дуже багато фактів, які ліквідують частину «білих плям» і значно збільшують можливості українців «підвищити своє світове реноме» і досягти перемог на фронтах і на всіх запланованих «Самітах Миру». Тому виявленою нами ***проблемою*** є ігнорування в сучасній Україні практично всіх нооісторичних досягнень, що ми детальніше пояснимо нижче в процесі розгортання нооісторії і використання основ багатьох нових наук про людину.

1.2. *Мета, завдання, методологія, джерельна база, сподівані результати*

Мету цієї статті ми вбачаємо у наданні читачам великої кількості тих найновіших досягнень у вивченні Prehistory і законів мислення та індивідуальної і колективної поведінки HSS, що невідомі програмам Штучного Інтелекту і перебувають в останніх по часу появи друкованих та інших наукових джерелах. Вказані закони є природними і дуже впливовими чинниками, подолати негативний вплив яких чи важко, чи взагалі неможливо. Тому тема «безвоєнного світу» отримає у статті альтернативний до поширеного варіант оцінки й бачення, що перекладе на читачів обов'язок заключного присуду чи рішення.

Ми б хотіли в межах обраної теми вирішити багато **завдань** — від вказівки шляху порятунку HSS від описаних у наукових виданнях і ЗМІ цілого комплексу екологічних та всіх інших загроз разом зі стиранням «білих плям» на кшталт пояснення глибинного поділу сучасної політичної і культурної Європи на дві частини, на домінування в них виразно полярних один до одного двох архетипів світогляду і діяльності — агресивного атлантичного

(чи західноєвропейського) і гуманістичного праукраїнського. Перший домінує на Заході, другий — на Сході, а сформована ще чотири тисячоліття тому межа між ними й досі співпадає з меридіаном Берліна від Балтики до Адріатики.

Українці під непереборним впливом обставин стали фокусом концентрації суперництва цих архетипів і змушені сьогодні виявляти максимум обережності й мудрості під час планування і реалізації своїх дій. Правдива нооінформація про появу цього поділу буде корисною для відновлення Вітчизни після Перемоги, зокрема, для конкретики втілення у життя поширених сьогодні намірів «європеїзуватися» і стати частиною Європейського Союзу і НАТО. Цей намір примушує нас включити в число завдань критичний аналіз того варіанту цивілізаційного вибору, який в умовах цілком реальної російської «гібридної агресії», але ще до сучасного загострення воєнних дій, обрали наші лідери — плани Президента і Кабінету Міністрів України [1] і колективний проект Національної академії наук України щодо цивілізаційного вибору для всього населення [2]. Ці плани не враховують прихід в XXI ст. трьох мегареволюцій у виробництві, гуманітарній сфері та в Штучному Інтелекті (ШІ). Ми вважаємо їх стратегічно помилковими і запропонуємо альтернативи.

Методологія всього нашого дослідження вимушено виявиться дуже складною і комплексною, адже нам доводиться оперувати інформацією з багатьох старих і нових наук, включаючи виявлені і винайдені нами ноонауки. Ми спиратимемося на принципи глобального еволюціонізму, історизму та інші не менш важливі, використовуючи переважно нові й мультидисциплінарні методи, правила, підходи і засоби. Ігнорування іншими науковцями ноонаук змушує відмовитися від огляду всіх праць попередників і цитувати тільки найнеобхідніші твори принципового і стратегічного значення.

Для отримання обґрунтованого і корисного для всіх результату нам доведеться ігнорувати явище сформованого в 1960-х роках узгодженого «світовою науковою громадськістю» використання слова «ноосфера» тільки для позначення запропонованої французом П.Т. де Шарденом у книзі «Феномен людини» уявної spirit-оболонки з усіх поєднаних усвідомлених і неусвідомлених думок мільярдів сучасних Homo [3]. У межах Sciences&Arts на Заході заборонені інші значення цього слова разом з усіма похідними з префіксом «ноо». Наслідком є повне ігнорування наших відкриттів за кордоном і все більші труднощі з поширенням нооідей в Україні. Всі перебувають у мороці переконання в неможливості існування екологічно ідеальних ноотехнологій та уникають сотень рятівних для людства понять для ноотехнологій і ноонаук. Пояснення читачам надасть Google-пошук для запропонованого нами слова «Nooglossary», що означає словник «нооslів з майбутнього» з необхідними поясненнями ([4] та ін.).

Вказане переконання у шкідливості для біосфери всіх відкриттів і виробництв стало помилковим з 2000 року. Тоді в потоці нанотехнологій ми помітили перші дві екологічно ідеальні — нанофотокаталізацію й отримання біопластиків через «доместикацію і генетичне удосконалення» ціанобактерій. З 2019 року кількість чудо-технологій зростає мало не по експоненті. У нашому переліку їх вже понад 40, хоч, очевидно, ми знаємо не все. З України вже йде «нооодуховлення» людства, що урятує його від передбаченої іншими науковцями неминучої загибелі-XXI і, сподіваємося, радикально і достатньо швидко зупинить вісім мільярдів HSS від вповзання і Третю світову війну.

З викладеного стає очевидним, що використана нами джерельна база відрізняється домінуванням найновіших наукових повідомлень після настання нового століття. Майже всі вони належать зарубіжним науковцям, адже політичні, економічні та всі інші події в Україні після відновлення незалежності не сприяли витраті чималих ресурсів на глибинне і майже повне реформування успадкованої від Радянського Союзу сфери наукових, технологічних та інженерних досліджень, переорієнтацію виробництва зброї посередньої якості на виготовлення продукції 5-го і 6-го технологічних укладів, яких потребувала і продовжує це

робити вся планета. Доцільно вказати на «маловідомий епізод» прихованого прибуття в Україну повноважного представника з острова Тайвань для переговорів про спільне виготовлення на київському «Електроні» й інших гігантських заводах вказаної продукції й негайного її поширення в Європі і поза нею. Задум провалився цілковито, що легко пояснити функціонуванням української економіки на основі «мастила», що має назву «корупція».

Відмовимося від характерного для нашої середньої освіти довгого переліку «сподіваних результатів і досягнень учнів». Ми сподіваємося на читацьку цікавість до новітніх світових наукових досягнень і до наших висновків та відкриттів на цій основі.

2. Накопичення знань про HSS і його спроможностей

Розпочнемо з невеликого інтернетного співставлення поширеності матеріалів щодо слів Home & Homo. Пошук через використання Google в момент створення цього тексту надав для першого 25 060 мільйонів результатів, а для другого — 271, що аж в 92 рази менше. Логічний і незаперечний висновок: HSS на даний момент накопичили «в головному сховищі» незрівнянно більше знань про необхідні для захисту від негативних впливів хатинки, хати, будинки і хмарочоси як про не менш корисні для «щастя» знання про себе.

Люди в усіх відношеннях знають про кожного HSS і всю популяцію «володарів планети» неприпустимо мало, що серед наслідків має високу (практично — постійну) поширеність різноманітного обсягу, характеру і значення конфліктів і війн. Доступних матеріалів різного виду й на різних мовах надзвичайно багато, тому замість переліку багатьох творів попередників ми обмежимося тільки трьома:

— книгою про майже всі погані риси людини [5],

- критичним кількісним передбаченням майбутнього у книзі 1972 р. видання з назвою «Межі зростання. Доповідь по проекту Римського клубу «Складне становище людства» [6]

- узагальненою оцінкою «якості поведінки й мислення HSS» нобеліанта і головного винахідника етології (в англомовних країнах — evolutional psychology [7]) австрійця Конрада Лоренца (1903-1989), який зазнав впливу двох світових війн і процесу розвитку «холодної війни» з усіма її шкідливими впливами. Світове визнання отримало його пророче попередженням про неминучу загибель людства у разі продовження здійснення «невибачальних помилок» [8], яке значно посилило світовий вплив другої книги.

Книга Т. Флешлі «Енциклопедія пороків: виправдання вад та слабкостей людської натури» варта хоча б побіжного ознайомлення. Вона має нетрадиційне скерування, адже торкаючись понад 100 недоліків і поганих рис пересічного HSS, її автор вживає обрані аргументи на докази того, що без всього цього справи були б ще гірші аж до рівня неможливості життєдіяльності. Ось як він оцінює себе: «Бог створив мене простодушним, дурним і наївним. Безпосереднім враженням я завжди піддавався більше, ніж переконанню, що походить від суті речей. Від цього виникає поверховість у моїх поглядах, смішна податливість і бентежна здатність самообманюватися. Поспішаю зізнатися в цьому, щоб не викрив мене проникливий читач, до рук якого може потрапити цей твір» [5, с.4].

З обраних трьох творів найбільший і глобальний вплив разом з перекладом на десятки мов і мільйонними накладами мала книга «Межі зростання» інтернаціонального колективу чотирьох молодих науковців, які одразу ж стали лідерами у футурології. Ідея цього твору й прискіпливий моніторинг її створення належить видатному американському фахівцю з вивчення і розвитку систем довільної складності Дж. Форрестеру (1918-2016). Книга виявилася виключно вдалою і впливовою, а от дві наступні — менш успішними [9].

Можливими причинами цього стало припинення цікавості Дж. Форрестера до цієї тематики і неувага колективу авторів до прискорення технологічного поступу після 2000 р. Вони так і не усвідомили факт появи екологічно ідеальних і рятівних для людства ноотехнологій, а тому залишилися песимістами й переконували читачів у неминучості

грандіозного Колапсу-XXI, рекомендуючи наприкінці третьої книги завчасно готуватись до конкуренції за рештки природних ресурсів. В останньому за часом появи в Інтернеті великому інтерв'ю Денніс Медоуз нагадує про створені ще в 1972 р. 12 моделей еволюції людства (з ними детально можна познайомитися у великій таблиці, яку містить стаття «Межі зростання в інтернетній Вікіпедії), стверджує їх правильність і здійснення у житті, а також засвідчує свій повний песимізм щодо подолання наявних і майбутніх загроз для всієї популяції HSS і марність будь-яких сподівань на «сталий розвиток» [10].

Тут ми змушені зробити необхідне уточнення і вказати на те, що насправді Д. Медоуз з колегами в книзі 1972 року запропонували 13 моделей, але остання мала описовий характер і не поєднувалася виразним чином з попередніми. Всі 12 ми можемо узагальнити рис. 1, який прогнозує розвиток подій у разі збереження характерної для HSS поведінки і відсутності якихось фундаментальних відкриттів і глибинної технологічної революції.

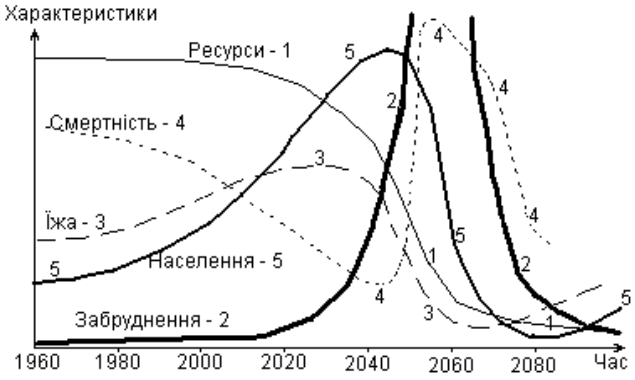

Рис. 1. Цілковито катастрофічна еволюція у разі використання індустріальних чи поліпшено-індустріальних смарт-технологій

Очевидний «катастрофізм» всіх явищ і відповідних ліній та поєднання всього негативного в тотальний "Екологічний колапс" в інтервалі 2050-2070 років. Про неминучість цього Колапсу-XXI і зараз пишуть майже всі науковці світу, мало кого цікавить найнижча точки лінії "5" — чи виживе хоча б 2-3% людей.

Уважне ознайомлення з першою книгою групи Д. Медоуза дало нам змогу помітити невеликий і цілковито текстуальний фрагмент з назвою «Зростання у стані рівноваги». У ньому вказані побажання щодо позитивного розвитку подій у разі організації людством стабільного населення, згодного на «помірне забезпечення» без будь-якого прагнення на його розширення. Це означає заборону на зростання виробництв усіх видів, зусилля зі зменшення забруднення довкілля через винайдення технологій повторного використання створених речей — від тарілок, взуття та одягу аж до електричних акумуляторів, автомобілів літаків і навіть ракет. Ми вважаємо ці пропозиції «моделлю №13» і відтворили її графічно на рис. 2, де перші п'ять ліній відповідають головним показникам цієї моделі у разі розвитку вільних від небезпечних викидів виробництв, перехід на повторне використання виготовлених речей, досягнення медикаментозними чи іншими методами стабільного за чисельністю населення планети, адже у разі його зростання загибель стає неминучою.

Рис. 2. Удосконалена уведенням екоідеальних ноотехнологій «текстуальна» модель №13 з книги «Межі зростання», яка розпочала ставати реальністю з 2000 року

Якщо модель №13 з книги «Межі зростання» передбачає жорстке обмеження населення Землі та уведення стандартів споживання всіх природних ресурсів разом з відповідною «екологізацією» процесів у виробництві і сільському господарстві (с/г) й стабілізацією споживання природних ресурсів, то запропонований нами на рис. 2 варіант масового використання екологічно ідеальних ноотехнологій ліквідовує практично всі матеріальні обмеження й зберігає природні ресурси, дає змогу біосфері повернутися до природно-рівноважного стану і навіть залишає можливість поступового зростання населення, адже HSS отримають для розселення колосальні території. Доведемо факт винайдення цієї можливості, пов'язаний з бактеріальною ноотехнологією «протеїн Fy».

Ми вважаємо її найціннішою і найвпливовішою серед усіх сучасних ноотехнологій і навіть одним з лідерів меганооревлюції №1 в усій виробничій сфері. Гейзерний мікрогрибок Fy (*Fusarium yellowstonensis*) за 3-4 доби в побутових умовах без біореакторів перетворює «органічні відходи» (листя, кору, траву і будь-яку органіку) в ідеальний білковий мікрофарш (назва — Abunda). Винайдений у США при пошуках забезпечення їжею учасників дуже тривалих перельотів у Сонячній системі, але там з невідомих нам причин обмежений у поширенні ринком веганських продуктів. А от у Західній Європі спорудили завод з перетворення зернового пилу в якісну їжу і проголосили намір поширювати бактеріальні ноотехнології. Навесні 2023 року на нараді міністрів економіки країн ЄС прийняли рішення розпочати без зволікань створення і використання подібних до «протеїн Fy» ноотехнологій [11].

Вкажемо, що прогрес за рік незначний, адже виділили кілька мільйонів євро на спорудження ще одного заводу. Неможливо навіть порівнювати цей міні-прогрес з розпочатими витратами на боротьбу з неіснуючими загрозами «глобального потепління» в обсягах сотень мільярдів євро. Загроз насправді немає через те, що збільшення вмісту вуглекислого газу підвищило середню температуру тропосфери на неістотний для глобальних кліматичних явищ один градус Цельсія і дало змогу біосферному фотосинтезу продукувати щорічно не 120, а 160 мільярдів тонн сполук вуглецю. Вже відбувається добре помітне з космосу збільшення зелених від трави і листя територій за рахунок скорочення пустельних теренів. Нікого дива тут немає, адже в промислового розміру оранжереях (їх багато в Ізраїлі, але ще більше — в Китаї) давно штучно збагачують повітря вуглекислим газом і набагато підвищують продуктивність рослин.

Ми, звичайно, дуже негативно оцінюємо вказане гальмування бактеріальної ноотехнології «протеїн Fy». Це гальмування не зникло й зараз, хоч перспективно подібне досягнення матиме просто фантастичні наслідки. Його швидке поширення не тільки гарантує ліквідацію голоду навіть у найбільш знедолених закутках планети, а й досить швидко

зумовить зникнення всього індустріального тваринництва, створеного для забезпечення мільярдів людей м'ясом. На основі відкритих даних ми підрахували, що в його межах відбувається щосекундне знищення приблизно 3 300 живих істот — від невеликих курочок до кількатонних сухопутних і морських тварин. Для харчування і нарощування маси цих знедолених нелюдською наругою живих істот, чимала частина яких впізнає своє відбиття у дзеркалі й напевне має індивідуальну свідомість, людство змушене обробляти сотні мільйонів гектарів полів, знищувати ліси для отримання пасовищ, що в сумі скорочує доступні до розселення території і стимулює появу міст з десятками мільйонів мешканців. Масове використання екологічно ідеальних ноотехнологій матиме грандіозні позитивні наслідки для комфортного розташування HSS на планеті і відновлення ландшафтів.

Та «комфортність життя і повне самозабезпечення» ще не означає ліквідацію негативних і генетично успадкованих рис у людини. Наукові рефлексії у цій темі мають видатного лідера — вже згаданого нами австрійського біолога та еколога К. Лоренца. В своїх головних прогностичних творах кінця 1970-х років він створив перелік найбільш страшних недоліків у поведінці HSS — «непрощенних помилок». Ось їх перелік з книги [8, ст.58,59]:

«1. Перенаселення Землі. Воно змушує кожного з нас захищатися від надмірно інтенсивних соціальних контактів, відгороджуючись від них, фактично, майже «нелюдським» способом. Воно провокує і збуджує високу агресивність як наслідок скупченості безлічі індивідів в надто тісному просторі.

2. Спустошення природного середовища. Це не тільки знищує нормальний життєвий простір і робить небезпечними місця нашого проживання, а й убиває в самій людині всяке благоговіння перед красою і величчю відкритого зовнішнього світу.

3. Погоня і змагання. До них схильні не тільки індивідуали. Все людство мчить наввипередки з самим собою, а різні види стимуляції згубного і все більш швидкого розвитку техніки робить людей сліпими до всіх справжніх цінностей, що не залишає їм часу для найважливішої людської діяльності — роздумів і міркувань.

4. Зникнення всіх сильних почуттів і афектів внаслідок зніженості. Розвиток техніки і фармакології породжує зростаючу нетерпимість до всього, що викликає найменший дискомфорт і невдоволення. Тим самим зникає здатність людини переживати ту радість, яка дається лише ціною важких зусиль при подоланні перешкод.

5. Генетичне виродження. У сучасній цивілізації немає ніяких факторів, крім «природного правового почуття» і деяких успадкованих традицій, здатних створити селекційний тиск на користь розвитку і збереження норм суспільної поведінки, хоча з ростом і ускладненням суспільства такі норми стають все потрібнішими.

6. Розрив з традицією. Він настає, коли досягається критична точка, в якій молодшому поколінню більше не вдається досягти взаєморозуміння зі старшим, не кажучи вже про культурне ототожнення з ним. Явище недостатнього контакту між батьками і дітьми викликає перші патологічні наслідки вже у новонароджених.

7. Безперервне зростання індоктринованості людства. Збільшення числа людей разом з вдосконаленням технічних засобів впливу на них призводять до такої уніфікації поглядів, якого ніколи раніше не знала історія. До того ж, спрямовувальна сила якоїсь доктрини швидко зростає разом кількістю твердо переконаних в її правильності послідовників, цілком можливо — навіть в геометричній прогресії. Ефекти, що знищують індивідуальність, вітаються всіма, хто хоче маніпулювати масами людей.

8. Ядерна зброя створює для людства значну небезпеку, але уникнути її набагато легше, ніж всього комплексу загроз від описаних нами вище семи інших процесів».

Відзначимо, що найлегшим для усунення недоліком дій і мислення людей К. Лоренц розглядав загрозу всепланетної ядерної війни, а найскладнішою перешкодою для подолання

майбутніх катаклізмів вважав сім виявлених ним поведінкових недоліків. Він так і не дочекався рятівних до людства ноотехнологій і не подолав негативну есхатологію.

Не менш жорстку критику деструктивних наслідків ідеї досягнення щастя і благополуччя через технічний прогрес ми знаходимо в книгах чудового американського мислителя Роберта Нісбета ([12] та ін.). Але ці та всі інші відомі нам заклики до усунення помилок і загроз в сукупності завжди були пропозиціями «отямитися, стати мудрими і поводити себе добре». Нереальність цих закликів довели всі останні світові події.

Закінчуючи цей підрозділ, нагадаємо читачам про доступні через Інтернет дві великі авторські статті з детальним аналізом «Людинознавства-ХХ» й основами «Ноолюдинознавства-ХХІ» [13; 14]. У них читачі знайдуть багато фактів з новітніх наук, які можуть допомогти і в самооцінці, і в спілкування та громадянській діяльності. Вони зберігають високу цінність та інформативність у даний момент, але в майбутньому з плином років стануть «історичними творами», відтворюючи знання про HSS на дату їх створення.

3. Нооісторичні пояснення розколу Європи та причин війн

З прадавніх епох кожен народ успадкував уявлення і повідомлення про події минулих часів, використовуючи їх для виховання всіх членів молодих генерацій. До появи писемності «читанням лекцій» займалися найбільш обізнані й шановані представники старших вікових груп. Етологи відшукали в природі велику різноманітність аналогів шкільного навчання для тварин і птахів зі зграйно-територіальним розселенням. Люди також належать до таких «зграйних видів», тому винайшли школи кілька тисяч років тому й використовують сьогодні.

Подібне поширення історичних знань для HSS відзначалося очевидними недоліками, але достатньо успішно виконувало завдання трансляції знань і досвіду від старших генерацій до молодших аж до появи держав з їх «пірамідальною» структурою управління й організації шкільного навчання в напрямі виховання слухняних виконавців наказів князів, царів, імператорів, султанів й інших, хто був «верхнім» у суспільній «піраміді». З того моменту історія все частіше ставала компіляцією вигадок і міфів, відвертої й необхідної для держави неправди з частими замінами одного варіанту «історії» на інший. Відповідальний автор набув переконливого досвіду в об'єктивному оцінюванні історичних знань, коли впродовж одного навчального року вчителька історії аж чотири рази повідомляла після кожного семінару для вчителів новий варіант оцінки «героя народів Кавказу імама Шаміля» (утім — з кінцевим поверненням до початкового тексту з підручника).

Так би тривало й надалі, але стрімкий розвиток всієї групи природничо-математичних наук наприкінці ХХ ст. зумовив появу і формування вказаної нами вище «нооісторії» як сукупності фактів про події Prehistory та їх учасників. А з настанням нового століття нооісторія стрімко розвивається, накопичуючи все більше вимірів і фактів. З одиниць вимірів вона переходить до тисяч і десятків тисяч, але навіть ця кількість лишається недостатньою для детального і точного відтворення подій за інтервал часу тисячі років з безліччю сучасних і вже зниклих племен і народів.

Для нашого дослідження появи й еволюції носіїв українських генів в реальному — дружньому і ворожому оточенні — особливо цінними виявилися нооісторичні досягнення кількох останніх років і місяців. Накопичене попереднім стеженням за спорадичними і розрізненими даними про виявлення чергової «археологічної культури» було не цілісним і логічним у єдності й розвитку знанням, а набором «пазлів», які могли так-сяк поєднати тільки професіонали з багаторічним навчанням і накопиченим досвідом.

Причину зрозуміти дуже легко, якщо звернути увагу на різницю термінів «Гребениківська культура» і «сучасна українська культура». Перший має переважно речовинно-матеріальний зміст, адже позначає вміст кількох мішків артефактів (черепків,

решток кам'яних та інших знарядь, кісток і т.д.), знайдених неподалік від села Гребеники на Одещині під приблизно метровим поверхневим шаром, який поступово накопичився за тисячі років від опаду пилу з Африки чи Заходу й решток рослин і тварин, які вловлювали з повітря вуглекислий газ і після загибелі поповнювали гумусну частину чорноземів. А от поняття «культура» має дуже широке охоплення і значення — і матеріальне, і ідеальне. Навіть тоді, коли стосується малої території чи частини населення. До появи нооісторії попередні знання складалися з фактів, отриманих від спостереження і вимірів знахідок, та припущень і гіпотез про вік і етнологічну приналежність всього матеріалу. А сучасна палеогенетика розпочала надавати достатньо точну інформацію навіть про фізіологічні характеристики прадавнього населення Гребеників.

Для великого полегшення викладу спершу використаємо рис. 3, отриманим фахівцями з палеогенетики (найвідоміші — американець Девід Райх і швед Св. Паабо). Рисунок належить до центральних у великій темі «генетична мапа сучасної Європи», пропонуючи узагальнений розподіл носіїв найбільших чоловічих гаплогруп.

Рис. 3. Генетичні дані про сучасний розподіл головних чоловічих гаплогруп в Європі

Наголосимо на тому, що:

1. вказаний розподіл сформувався 4 000 років тому в часи енеоліту після удесятеро тривалішого попереднього процесу й зберігся в усіх війнах;

2. основна заслуга у винайденні с/г в Анатолії і в Східному Середземномор'ї належить представникам гаплогруп I та J ще в часи палеоліту (приблизно 10-11 тисяч років тому), але пізніше їх гени занепали в усій Західній Європі через геноцид, вчинений пращурами сучасних народів, які заселяють території на захід від меридіану Берліна;

3. відтворений на рис. 3 поділ Європи практично повністю співпадає з рішеннями Ялтинської конференції (11-14 лютого 1945 р.) щодо розмежування територій капіталістичного й комуністичного впливу для післявоєнного часу.

Для пояснення нових доказів участі носіїв українських генів в усіх головних подіях на теренах західної Євразії використаємо великий авторський рис 4, наведений тут варіант якого враховує найновіші відкриття і досягнення світової нооісторії.

Схему з кривих ліній і позначок датувань для поширення рільництва на терени Європи ми запозичили з книги Дж. Даймонда [15], але пізніше доповнювали нооісторичними фактами й словами. Брак різноманітних позначок для пра-України пояснюємо тим, що всі виміри фінансували багаті держави ЄС і піклувалися про себе, а не про нас.

Дані рис. 4 однозначно свідчить про те, що вирощування зернових започатковане не на наших чорноземах, а на пенепленах (горбкуваті трав'янисті терени дуже еродованих давніх гір) у північній зоні Родючого півмісяця біля позначки-овалу Гебеклі-Тепе (його прадавня назва — Портасар — була вірменською). Саме на цих пенепленних теренах Доля (чи Бог?) організували все таким чином, що носії українських генів здійснили мегаподвиг задля порятунку всього людства і виходу його зі стану смертельної небезпеки, Звісно — пращури рятували насамперед себе, але одночасно зіграли роль рятівників всіх HSS.

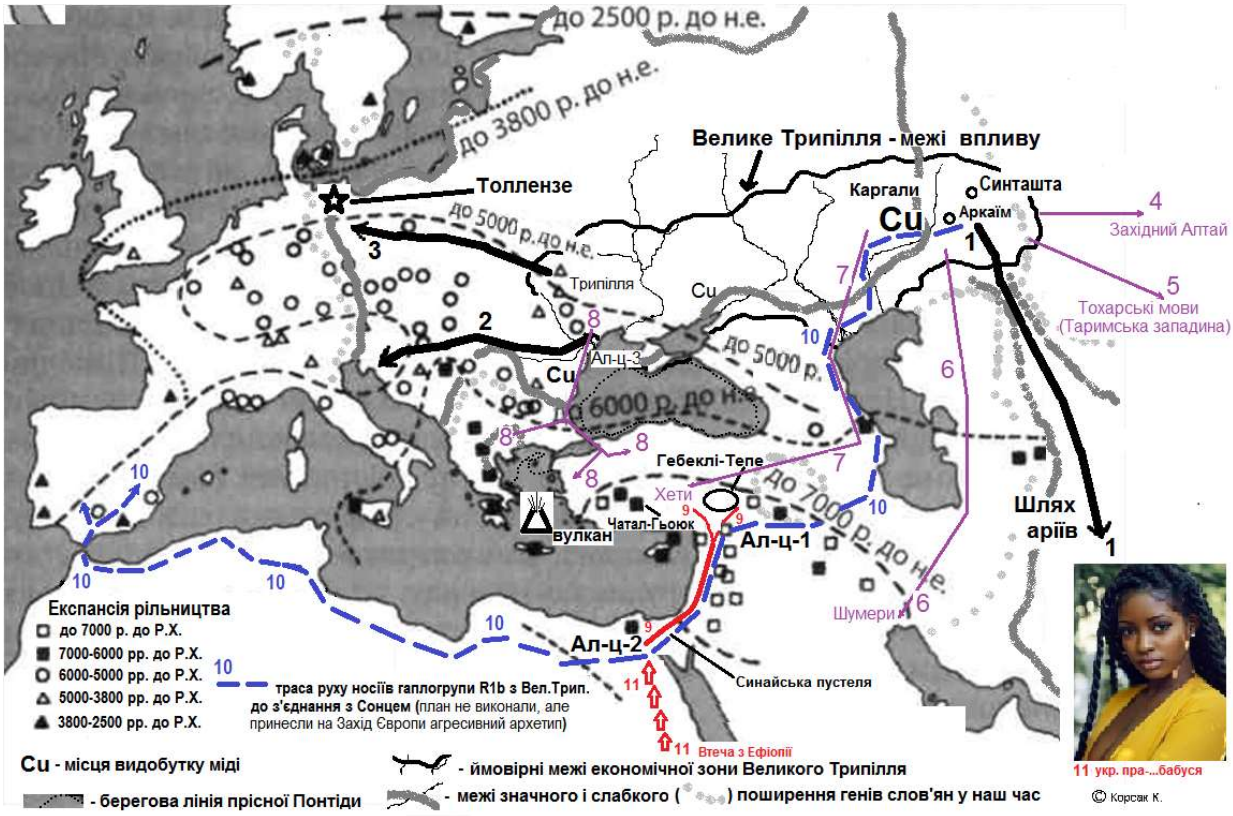

Рис. 4. Схема подій на теренах перебування і подвигів носіїв українських генів

Початок пояснення мегаподвигів носіїв українських генів розпочнемо з головних даних про ненеплени, які ігнорують історики й археологи цілковито, цікавлячись заплавами і дельтами великих південних рік з пухкими і дуже придатними для рільництва ґрунтами. Вся сучасна Історія Стародавнього світу оповідає тільки про них і ніде не згадує пенеплени.

Це серйозна методологічна помилка, яка не дає змоги відтворити справжню Prehistory всього людства і створює хибний ланцюг подій з помилковими датами та учасниками. Насправді справжній прогрес HSS розпочинався на пенепленах, де винайшли с/г і значно пізніше перенесли його на алювіальні землі дельт і заплав. Просимо читачів у своїх наукових пошуках не забувати про пенеплени і використовувати вказане нами й інші джерела.

Пращури українців разом з сусідніми племенами зробили особливо великий внесок в технологічний прогрес, бо з ласки Долі з самого початку перебували не в дельті якоїсь великої річки (Нілу чи Гангу), а на дуже багатих на природні ресурси пенепленних територіях. Приблизний відповідник цього терміну в українській мові — терени лісостепів, що являють собою зрізані ерозією рештки колись високих гір. На цих плавних горбах трава і ділянки диких злаків вкривають чорнозем, який за тисячі років рослини «створили» самі для себе, і розташовані під ним шари різноманітних глин і твердіших порід.

А ще глибше розташовані «корені гір» — дуже багато корисних копалин (кремені, руди міді та інших металів тощо). У багатьох місцях у часи Prehistory зустрічалися руди різних металів, а також кремені й обсидіани (вулканічне скло), з яких виготовляли особливо якісні та ефективні знаряддя праці, полювання і оборони. Пізніше за тисячі років люди позбирали спершу самородки металів, а пізніше викопали з поверхневих шарів все найцінніше. Якщо рудні пласти були похилі, як в Україні на Луганщині, то гірнича справа врешті припинялася через неможливість праці на значній глибині. Найціннішими, як Каргали у Великому Трипіллі на північ від Оренбурга, були родовища з плоскими шарами руд на невеликій глибині під шаром глин, що дуже полегшувало створення шахт.

Вкажемо на рис. 5 розташування пенепленів на тій частині Євразії, яка була тимчасовим чи довготривалим «домом» для носіїв українських генів чи споріднених народів.

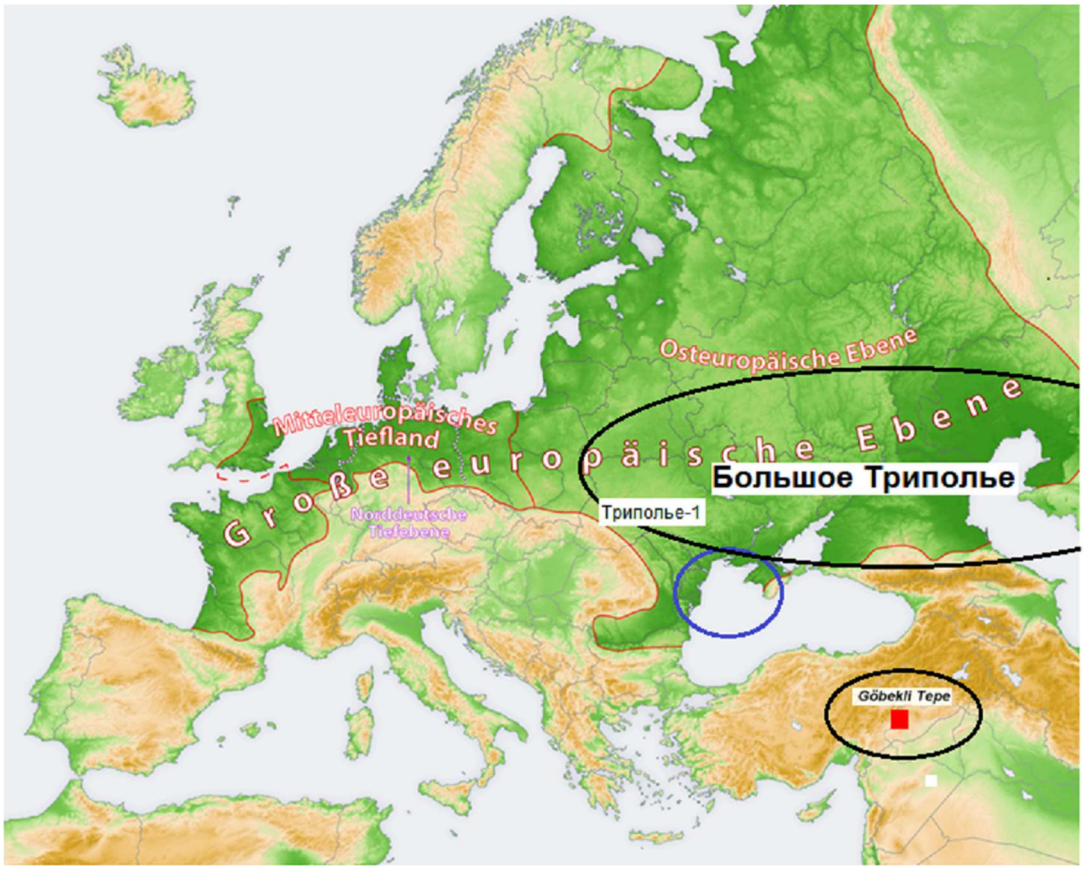

Рис. 5. Локалізація пенепленів на теренах Європи (замкнені чорні і червоні лінії, а синім вказано місце перебування пращурів в дельтах рік, що впадали в прісну Понтіду)

Пенепленною є більша частина території України. Великі і феноменально багаті на корисні копалини є німецькі «Tifebene (низовини)», серед яких очевидним рекордсменом є «Рудні гори», з яких викопували просто гігантські самородки срібла — набагато більші від ширини штреків (знахідку доводилося… розрубувати на частини). Речовинне багатство Рудних гір та інших пенепленів було основою для особливо високих технологічних досягнень багатьох народів. Наприклад — другу хвилю індустріального поступу здійснили саме «пенепленні» народи. Це були Англія, Бельгія і Північна Франція, урешті — Німеччина з її Рудними та іншими горами За сукупністю всіх показників ми пропонуємо ввести поняття «***пенепленні цивілізації***» як потрібне доповнення до терміну «***алювіальні цивілізації***», що виникали на річкових намулах. Перші стали піонерами у винаходах і технологіях, другі — в організації держав, створенні писемності і перших наук, виробах з дерева та ін. Вони стали

осередками стагнації, адже буденне життя громадян Єгипту в дельті Ніла майже не змінилося з тих часів, коли існування вже зниклого відгалуження великої річки надзвичайно полегшило підвезення матеріалів для спорудження групи гігантських пірамід.

Та продовжимо головний виклад і коротко пояснимо вервечку фактів щодо українців.

1. Новітні відкриття в своїй сумі засвідчили два витоки українських генів — африканський і аріївський. Набагато старший перший і досягає 60-70 тисяч років, коли в північній частині Ефіопського нагір'я з його виключно комфортними природними умовами сформувалися племена напівпігмеїв з виду «подвійно розумних (HSS)». Але вони виявилися за фізичними можливостями серед найслабших серед усіх різновидів HS. Чоловіча частина не змогла захистити своїх феноменально гарних красунь (що й відтворено на рис. 4) від агресивних зазіхань великих сусідів. Пращурам довелося шукати порятунку, а тому по трасі «11» вздовж Нілу вони врешті сховалися серед високих очеретів його дельти. Але це було ненадійне сховище, адже втечі з Африки заважали 200 км цілковито сухої Синайської пустелі. Зрештою Доля (чи може Бог?), оцінивши інтелект пращурів серед HS, скерувала їх на виконання рятівних для всього людства вчинків, які ми пропонуємо назвати «***мегаподвигами носіїв українських генів***». Для цього Синайська пустеля «небесними силами» була «достатньо зволожена» (докази наведені у статті [16]) і 50 тис. років тому пращури вдало перетнули приморські струмки і річечки, потрапили в Палестину й розосередилися вздовж вказаної на рис. 4 траси 9. Південь обрали майбутні євреї і палестинці, північ — наші пращури, майбутні «європейські фермери», курди і вірмени. Там були доволі сприятливі для життя пенепленні терени, багаті не тільки на травоїдну дичину, а й на різні однорічні види диких злаків і бобових з великим насінням. Поєднання зграйних тварин і однорічних рослин стало основою для винаходу с/г.

2. Прогрес у знаряддях полювання і праці, зростання населення і група природних кліматичних загроз на початку процесу танення грандіозних льодовиків у своїй сукупності загострили небезпеку канібалізму й великих людських втрат. На короткий період збирання пенепленних природних врожаїв зернових сходилися разом старші за віком особи з різних племен, які в перервах між визріванням різних видів на початку літа спільно шукали шлях порятунку. Їм допомагали підлітки, бо «жнива» були нескладною працею.

Маємо багато підстав стверджувати, що проблему знаходження шляху до ліквідації канібалізму вирішила одна людина — наш геніальний винахідник «Y». Він винайшов кільцеву мегалітичну арену (КМА). Це на диво «інтелектуальне навчально-виховне приладдя», перше з яких виявлене археологами на горбі Гебеклі-Тепе, а пізніше ще в багатьох місцях у Східній Туреччині. На рис. 6 вказано положення горба і структуру КМА.

Рис. 6. Локалізація Гебеклі-Тепе на Близькому Сході і структура Кільцевої мегалітичної арени (КМА)

У центрі круглої площадки розміром з циркову арену «Y» поставив у вертикальному положенні дві великі вапнякові плити Т-подібної форми (це стилізована фігура Homo з розведеними руками). Середня лінія між плитами вказувала на Полярну зірку — точку перетину продовження осі добового обертання Землі з «небесною сферою». У ті роки такою зіркою був Сиріус — найяскравіший в усій Північній півкулі. Арену по колу з вставленими «для міцності» меншими Т-плитами оточували невисокі й плоскі камені, які мали зверху позначки для визначення днів і тижнів року.

Загалом же споруда могла слугувати «храмом-обсерваторію», усередині якої навіть у повній темряві легко визначали сторони світу, а в момент появи чи зникнення сонячного диску по позначках на кільці з плит з непоганою точністю орієнтувалися щодо днів року.

Ми переконані в тому, що великій витраті часу сотень людей в процесі побудови споруди №1 передували роки «пропаганди» з вуст «Y». Разом з подібними до нього особами старшого віку він обговорював не тільки тему «погода і врожай», а й шляхи боротьби з ростом канібалізму у разі зменшення бази для харчування. Було логічним запропонувати сівбу зернових і бобових разом з одомашненням малих копитних. Але в слушності таких дій необхідно було переконати не тільки старих мудрагелів, а й загал молодшого населення.

Ось тут і могли зіграти свою роль храми-обсерваторії, де «Y» та інші «лектори» пояснювали спрощену й практично очевидну модель Всесвіту, його упорядкованість, вказували на існування вищих і цілковито непереборних керівних впливів для всіх періодичних явищ свого довкілля з одночасним усвідомленням пріоритетності й необхідності надати молоді головні ідеї та знання, скеровані на гуманізм і відмову від канібалізму.

Вкажемо ще один вельми важливий світоглядно-культурний факт. Це був випадково-природний катастрофічний чинник — потік каміння з Космосу 12 800 років тому. Він безмежно переконливо підтвердив і правильність всіх настанов уже покійного пращура «Y», і необхідність гарної поведінки й пошани до Небес хоча б через страх перед їх безмежною силою. Зображення подібного «хвостатого пострахy» відтворене на одній з Т-плит на горбі Гебеклі-Тепе.

3. Відтак, поблизу кільцевих споруд стали з’являтися невеликі поселення, мешканці яких відповідно до розробленого в Гебеклі-Тепе «генерального стратегічного плану»

розпочали засвоювати засади толерантної поведінки та з усе більшим успіхом одомашнювати рослини і тварини. Йшов відбір на слухняність та інші корисні якості серед овець, кіз, турів і свиней. Для проміжку 12,5–10 тисяч років тому помічено і трохи розкопано чимало невеликих стабільних поселень, мешканці яких усе ще були мисливцями і збирачами, але активно просувалися до фермерства. Мисливство поступово втрачало лідерство в забезпеченні наших пращурів білками і жирами.

Доцільно уточнити, що на південніших територіях з так само старими першими поселеннями (Єрихон та ін.) відсутні навіть натяки на подібні до Гебеклі-Тепе демонстраційно-виховні споруди. Не випадково сформувалися такі великі світоглядні відмінності між Палестиною й Анатолією. На півдні виник майбутній порівняно агресивний ***атлантичний культурний архетип***, на землях наших пращурів — ***гуманістичний праукраїнський архетип***, який у даний момент українці в черговий раз захищають від ворожої навали.

4. Історія свідчить про те, що рільники ніколи без дуже вагомих причин не покидали землю-годувальницю задля ознайомлення з загоризонтними умовами. Схоже, що посилення нападів агресорів зумовило мирну демографічну експансію винахідників землеробства на Захід і Північ, що й вказано на рис. 4. Наші пращури певний час жили на північних берегах прісного озера з назвою «Понтіда», але після появи Дарданелл і Босфору 7200 років тому зміститися у лісостеп і поєдналися з місцевими мисливцями-аріями. Вони були носіями чоловічої гаплогрупи R1a (слов'янської з алтайським походженням) і значним досвідом та силою, необхідними для успішного полювання на великих тварин.

Неперетинання екологічних ніш присадкуватих хліборобів і високих міцних аріїв стало основою справжнього земного раю під назвою «Трипілля» з усіма ознаками українського національного архетипу: миролюбністю, рівністю статей, повагою до пращурів, майже повною відмовою від силового способу вирішення конфліктів і т.д.

Індивідуальні особливості аріїв ми вважаємо причиною успіху в одомашненні диких коней (детальне пояснення вимагає звернення до етології і цитування щойно надрукованих статей зарубіжних авторів). Західні дослідники давно вказували на перше одомашнення коней на півдні України приблизно 6000 років тому, але тільки зараз мало не 200 науковців багатьох держав довели, що в інтервалі 4200-4000 років тому наші пращури створили породу слухняних тварин з дуже міцною спиною [17]. Тому вони в черговий раз стали технологічними лідерами світу, прискорили винахід колісного транспорту й урешті трансформували Трипілля у ***Велике Трипілля — ВТ***. Так ми пропонуємо називати терени першого світового поділу праці між Карпатами й Сибіром, що стали витоком індоєвропейських мов та однойменної культури, які детермінували прогрес людства. Це був мегаподвиг-2 — одуховлення людства.

Вплив ВТ на всю західну частину Євразії вказаний стрілками на рис. 4. Досягнення пращурів у конярстві, гірництві та металургії зумовлювали потоки прибульців/розвідників і засвоєння ними виробничих термінів-тегів, що склали основу списків Сводеша для спільних слів всієї мовної індоєвропейської сім'ї. Вони рідко встигали запозичити ще й ВТ-гуманізм. Ми запропонували «хмарно-тегову модель» формування всієї «індоєвропейськості» (спільно з Л. Ляшенко [18]) й детально описали в багатьох статтях з необхідними доказами.

Нещодавно науковці уточнили дату грандіозного вибуху егейського вулкану, що створив кільцевий Санторінський архіпелаг — 1628 р. до н.е. Тривале зникнення Сонця спричинило «похід аріїв» на Південь з усім відомими мовними і культурними наслідками. Ще до цієї дати «західні трипільці» рухались до Атлантики, де на меридіані Берліна сформувалася межа слов'ян з трипільським (праукраїнським) архетипом.

Спершу тисячі років у Західній Європі жили нащадки винахідників землеробства — «первинні єврофермери» з гуманістичним архетипом, принесеним ними з Близького Сходу,

які вправлялися у будівництві тисяч мегалітичних споруд. Але пізніше у роки розквіту Великого Трипілля там сталися грандіозні зміни через прихід в Південну Іберію не надто численної групи носіїв чоловічої гаплогрупи R1b (ербінів), що ліквідували гуманізм і нав'язали «атлантичний» чи «західноєвропейський» архетип.

Згаданий нами Д. Райх був першим, хто виявив факт занепаду генів землеробів і заповнення Заходу, як свідчить рис. 3, генами ербінів. Вони прийшли з великотрипільськими технологіями і досконалою зброєю по довгій і зручній для руху колісниць трасі: Дагестан → Азербайджан → Близький Схід → Єгипет (Тутанхамон мав гаплогрупу R1b) → південні береги Середземного моря → Марокко. З Марокко носії гаплогрупи R1b 5000 років тому висадилась на берег поблизу Гібралтару. Невдовзі на кожного «західного чоловіка» припало 17-18 жінок, але пізніше нерівновага зменшувалася, прибульці ігнорували побудову нових мегалітів й розпочали спорадичні криваві напади на східніші племена, які мали великий зиск з організації та охорони «бурштинового шляху».

Так сформувалася міцна економічна основа для воєнної агресії західних носіїв чоловічої гаплогрупи R1b на слов'янський Схід. Логічним наслідком стала просто грандіозна для тих «троянських часів» битва 3250 р. тому на переправі через багнисту річечку Толлензе (польська назва — Dołęża) між об'єднаною армією ербінів і воїнами-селянами — пращурами поляків (представників лужицької культури). Найновіші генетичні дослідження свідчать про майже повну генетичну тотожність поляків та українців (трипільців), що пояснює безліч явищ і прадавнього минулого, і волонтерський порив сучасних поляків у момент прибуття з України сотень тисяч матерів з дітьми в кінці лютого 2022 року, і майже всі особливості поведінки населення держав ЄС в даний момент.

На «бурштиновій» переправі лужичани організували засідку й за кілька годин вкрили трупами кілька кілометрів берегів, а пізніше поскидали тіла в мулисту воду. Нині тривають розкопки й створений у ФРН музей поступово заповнюється тисячами експонатів (кісток, решток зброї та ін.).

Розгром був настільки тотальним, що ербіни, тевтони й інші західні агресори збиралися з силами для нових атак Сходу майже 2000 років. На шкільних уроках історії ми всі вивчали історію «західних» війн, геноцидів, релігійних походів, створення імперій та конкуренції між ними. Рекордним культурним антидосягненням пращурів сучасних західноєвропейців ми вважаємо публічні спалення «відьом» на міських площах. В світоглядному аспекті вони проголосили себе «найдосконалішими», а слово «степ (чи лісостеп)» навіть зараз ототожнюють з поняттям «дикунство».

Викладені факти й багато інших нооісторичних відкриттів свідчать про те, що сучасна «західноєвропейськість» має міцну генетичну ербінівську основу, презирство до слов'ян і відверте небажання допомагати нам у нерівній боротьбі з «рашистами», які за кілька сотень років минулого тисячоліття запозичили найгірші «атлантичні» взірці, доповнивши їх власними винаходами часів перетворення Московії в гігантську Російську імперію.

4. Критичний нооаналіз академічних та урядових планів європеїзації

Спершу вкажемо на те, що практично всі сучасні держави-лідери ЄС і НАТО не мають серйозних підстав слугувати Україні взірцем щодо суспільних цінностей та провідного світоглядного архетипу. Недоцільно серйозно ставитися до їх вимог державної підтримки членів ЛГБТ-руху і віднесення їх до найкращої частини населення, до оцінювання якості науки й вищої освіти тільки через публікацію творів українців у кількох приватних й орієнтованих на фінансовий грабунок авторів провідних виданнях (Китай і Велика Британія вже відмовилися від цієї збоченської практики). Нам краще припинити посіпацтво й діяти цілковито автономно, як ірландці після 1990 року. Особливо корисно поширювати нооідеї, ноонауки і

ноотехнології, адже в даний момент Вітчизна стає незаперечним моральним і світоглядним зразком.

Однак заплановані новими керівниками України та її провідними науковцями стратегічні плани до 2030 року радикально інші й продовжують недолугі дії розвитку незалежної держави, проголошеної 16-07-1990 року практично одностайним рішенням всіх комуністів у Верховній Раді у сподіванні припинити возити київські торти й інші хабарі в Москву й надалі залишати їх собі. Ці меркантильні й інші подібні міркування разом з браком знань і чесних намірів в українських лідерів пояснюють майже все у подальших вже понад 30-річних подіях.

Ми можемо тільки мріяти розгорнути цей пункт в монографію, скласти рейтинг шкідливості усіх наших президентів, навести перелік помилок патріотів та інноваторів, вказати на скерування зусиль зарубіжних «прихильників» на знищення всього технічно-технологічного потенціалу України й перетворення її в країну Третього світу (появі незалежної України відверто зраділа тільки Польща, а майже всі виявилися українофобами), але вимушено обмежимося тільки кількома форсамажорними (непереборними) фактами. Основу нашого нооаналізу складе зміст рішень Кабінету Міністрів (документ [1] і великий енциклопедичний твір півсотні провідних науковців НАН України щодо правильності її цивілізаційного вибору[2].

Головним витоком їх стратегічної помилковості є повне ігнорування ноодосягнень людства після 2000 р. і повна переконаність в неможливості екологічно ідеальних виробництв й вимушеній необхідності продовжити індустріальний (чи неоіндустріальний) розвиток. У них читач не знайде слів з префіксом «ноо» (академіки спромоглися не згадати ні про ноосферу, ні про В. Вернадського), але познайомиться з цілком відвертою рекламою економічних та інших взірців з ЄС і НАТО.

Особливо важливим у світоглядному плані ми вважаємо згадану книгу НАНУ про бажаний цивілізаційний вибір України [2]. Вона має аж 46 титулованих авторів, містить кваліфікований аналіз українського сьогодення з великою кількістю важливих даних, але неприємно вражає читача категоричністю твердження неприналежності України до цивілізованих країн і помилковістю заключних висновків і рекомендацій. Творці Доповіді переконані в тому, що все «цивілізаційне світло» плине від Атлантики, що тільки там панує прогрес й пропонують посіпацьку рекомендацію для всіх українців:

«Зосередившись на євроатлантичному цивілізаційному векторі, Україна зможе позбутися рис маргінальної суміжної цивілізації, конфліктного потенціалу культурного і релігійного еклектизму, зміцнити національну ідентичність, надати їй чітких рис, що має бути втілено у реалізацію відповідного цивілізаційного проекту» [2, с.272].

Ми не згодні з цією наївною гіпотезою про досягнення щастя і благополуччя через бездумне копіювання всіх ознак «західної цивілізації», адже попри гарне словоблуддя вона насправді фаворизує багатих і жадібних, безпринципних і некультурних у родинних і безлічі інших важливих питань (ми вже вказували на ЛГБТ-збочення, але не бракує й інших). Наприклад, примус КМ і МОН України всіх викладачів і дослідників до публікації наукової продукції у приватних «західних» виданнях Scopus-WoS нічого не дає для технологічного поступу України, але помітно зменшує життєвий рівень освітян і науковців. Радіють тільки євроатлантичні чиновники, адже вони примусили українських посіпак діяти за своїми наказами і/чи «рекомендаціями».

Є багато пояснень вказаного «академічного вибору» цивілізаційного шляху розвитку сучасної України. До ігнорування її авторами факту появи ноонаук і ноотехнологій додамо відсутність правдивих знань про справжню історію носіїв українських генів, уславлення «атлантичного архетипу» і зневага до пратирипільського українського. Цією статтею і всіма нашими новими творами ми намагаємося удосконалювати вищу школу, надавши молоді

факти щодо існування і особливостей двох відтворених на рис. 3 сучасних європейських архетипів і забезпечити їм правильність самостійного вибору того, який вони визнають кращим і більш придатним для себе.

Зробимо невелике термінологічне зауваження щодо все більшого поширення у нас двох слів «європеїзація України» (в [2] і безлічі інших творів). Оскільки слово «Європа» позначає континент, а не державу з власною культурою, то вказане словосполучення позбавлене сенсу. Не поліпшиться справа, якщо намагатися інтегруватися в «європейську культуру», бо таку не можуть запропонувати ніякі словники через її цілковиту відсутність. Вказані непорозуміння мають витоком банальну «побутову» відмову від точного наукового слова «західноєвропейський» заради коротшого «європейський». Тому приєднання до ЄС зазвичай називають «європейською інтеграцією», а до НАТО — євроатлантичною.

Закінчимо виклад цього підрозділу патетичною констатацією того, що поява і прискорення розвитку вказаних нооревoлюцій свідчить про здійснення носіями українських генів не тільки «мегаподвигу-5» у нерівній борні з рашистами, а й все ще недооціненого другого одуховлення всього людства — нооодуховлення з побудовою ноосуспільства й забезпечення ноосимбіозу Homo і біосфери.

5. Висновки і пропозиції

Повертаючись до вказаного на початку статті наміру Д. Трампа ліквідувати війни на Землі, оцінимо його позитивно в цілому, але одразу зробимо наголос на тому, що доцільно зачекати точнішої інформації про те, як він збирається діяти на практиці. В аспектах правого й універсального регулювання слід розпочати зі створення і прийняття «Світової Конвенції про обов'язки людини» і подібного документу (Світової Конвенції з етики журналістики) для діяльності всіх видів засобів створення і поширення інформації. Навіть побіжний аналіз свідчить про те, що в багатьох випадках в момент створення якоїсь міжнародної інстанції чи об'єднання держав її Статут формулювався так, що навіть невеликі прояви негативних рис поведінки однієї чи кількох осіб вистачає для повного гальмування її діяльності (приклад — Рада Безпеки в ООН зі збереженням права вето для Росії).

Тому першим кроком Д. Трампа і його команди може стати створення і прийняття низки конвенцій та інших подібних документів для обмеження можливості для агресорів чи «ображених» гальмувати діяльність всепланетних чи великих локальних організацій в ті критичні моменти, коли треба прислухатися до думки більшості, а не одинаків.

Для створення умов для мирного співіснування чверть тисячі окремих держав і значного числа «незалежних територій» необхідно прийняти закони для сприяння створення і поширення наявних і майбутніх екологічно ідеальних ноотехнологій. Якщо організувати значні стимули для винайдення цих рятівних технологій та одночасно заборонити використання всіх екологічно деструктивних індустріальних й подібних виробництв, то без якихось труднощів можна забезпечити їжею і всіма засобами життєзабезпечення не тільки вісім мільярдів, а й удвічі більше населення Землі.

Та схоже на те, що світові політичні лідери, включаючи Д. Трампа й керівництво України, цілковито ігнорують факт існування і зростання кількості рятівних для людства бактеріальних та всіх інших ноопроцесів. Істиною у футурології вони вважають пропозиції Світових економічних форумів у Давосі, організатори яких не цікавляться «проривними відкриттями з XXI ст.) і здійснюють планування на основі старих і дуже старих економічно-соціальних теорій.

Закінчимо статтю сподіванням на те, що активно-позитивна частина лідерів світу обере шлях ноопрогресу та ліквідації підстав для великих і малих конфліктів на основі врахування вказаних нами трьох мегаоореволюцій — заміни старих виробництв

ноотехнологіями, поширення правдивої інформації в усій гуманітарній сфері й прискореного розвитку Штучного Інтелекту як засобу серйозної боротьби з усіма видами небезпечної для миру і спокою брехливої інформації.

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