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BIOLOGICAL SCIENCES

GENERAL CHARACTERISTICS OF MICOLOGICAL STATUS IN KINDERGARDENS (IN THE SAMPLE OF BAKU CİTY)

Aliyev İ.A.,

PhD in biology, leading researcher,

Institute of Microbiology of the Ministry of Science and Education, Baku, Azerbaijan

İbrahimov E.A.,

PhD in biology, senior teacher, Azerbaijan Medical University, Baku, Azerbaijan

Samedova G.S.

PhD in biology, Senior lecturer, Azerbaijan State Pedagogical College, Baku, Azerbaijan https://doi.org/10.5281/zenodo.7878302

Abstract

The presented work is dedicated to analysis of micological status of kindergardens constructed in Baku City and mainly registered with the state. It was determined that micobiota formed in the interior environment of kindergardens consisted of 10 genes and 21 species 57% of which are the representatives of Aspergillus, Penicillium and Cladosporium genes. It was identified that dominant species of fungi are directly involved in the formation of dominant core of micobiota in the kindergardens. As well as it became known that almost all the fungi registered are mainly spread in the atmospheric air in rooms with different stetus. Its defined that conventional pathogenic fungi are easily adhessed on the tender skin of kids and on ecological condition are quickly transforming to aggressive inflamors of invasive mycoses.

Keywords: Baku City, kindergardens, micological, status, micobiota, interior environment, rooms with different status, atmospheric air.

Introduction. Also the studies contucted show that urban environment is characterized more as the ecosystem subjected to antropogenous influence than anything else [7; 8; 9]. In antropogenic environments comparison of autotrophic and heterotrophic blocks demonstrates the more active position than the second ones. For the ability they can spread widely fast penetration, adaptation and powerful protein system, the study of micromycetes has become the central point for investigators [3; 4; 13]. Taking into account that microscopic fungi is one of the main components of antropogenic environments, especially of residential buildings, depending on disbalance of faktors they are rapidly transforming into potential infection originators, so at this moment it becomes clear to what extend the problem is of medical-social importance [1; 2; 11].

Objective. The aim of the presented work consisted of the study of dependences on real ecological condition of micological situation of kindergardens, especially being in state registration, functioning in Baku City.

Materials and methods. As the subject of the study 20 kindergardens were chosen from the 200 functioning under state registration in Baku City. In the registered kindergardens from different status rooms, also from the rooms as well where kids work, play, eat and rest, accordingly using the methods of sedimentation and application were taken samples and inoculated in mediums such as Capek, Capek-Dox. and Saburo. After that fungal colonies formed on Petri cups were analyzed as per cultural-morphological features and removed onto pure culture being identified. Its worth to note that the number of fungi spread both in oblique quantity of atmospheric layer and 1 gr. of applicative

material is expressed with CFU which shows the general growth [5; 6; 10; 12].

The obtained results and their discussion. Speeding up of the urbanization is observed by population growth, especially in central cities. The growth of population is evidently shown, especially in central cities. It should be noted that in urban environment the most part of lifetime of younger generation before school, as well as upbringing, nutrition, rest time etc, is spent in kindergardens. That is, recently growing demand for daycare resulted in remarkable increase in number of kindergardens being both in state and private registration.

During the studies held we came across such a fact that the kindergardens in Baku City are usually functioning either in single-storey buildings ar on the first floor of residential buildings. While estimating the micological condition of kindergardens, first of all, the main focus lies on identification of variety of species and number composition of micobiota formalized in air space of rooms with different status where kids work, play, rest and, are fed. It became evident that the micobiota formalized in atmospheric air of inner environment of kindergardens consists of 10 genius and 21 species of micromycetes (table 1). As we can see from the table, the most species variation is shown in Aspergillus with 5 species, Penicillium 4 species, Cladosporium 3 species, Mucor and Alternaria lach 2 species, the rest of the species are represented by one specie.

We should note that according to analysis fulfilled on microsystem inhabited in kindergardens, the representatives of Aspergillus, Penicillium and Cladosporium consists 57% of the formed micobiota and demonstrates a dominant position. At the same time different species of the genus mentioned are also

characterized by frequency of detection and directly takes port in the organization of the dominant nucleus. Also almost all the fungi registered, as well as the species due to Zygomycetes and Ascomycetes classes are widely spread in air space in inner environments of kindergardens, As well this fact was also known that micromycetes which form aerogen microbiota of the rooms with different status of kindergardens are both the permanent inhabitors of soil environment and the acute contaminants of food products. Taking into account the existence of pathogenic and conventional

pathogenic representatives as well, among the micromycetes spread in inner environment of kindergardens, so its inevitable to say that they are potential originators of different mycotic deseases of either endogenous or exogenous character.

It was identified that in the kindergardens, as the originator of opportunist mycoses, the species A. flavus, A. fumigatus, A. niger, A. versicolor due to Aspergillus specie, P. chrysogenum,

Table 1

Species diversity of micromycetes spread in atmospheric air of kindergardens

Genus of fungi	Species of fungi	
Aspergillus	Aspergillus flavus Link, A. fumigatus Fresen; A. niger Tiegh; A. ochraceus Wilh, A. versi-	
(1/5)	color Tirab.	
Penicillium	Penicillium brevi-compactum Dierckx; P. expansum Link; P. chrysogenum Thom; P. clavi-	
(1/4)	forme Bainier.	
Cladosporium	Cladosporium cladosporioides de Vries C. herbarum Link.; C. elatum Nannf .	
(1/3)		
Mucor	Mucor circinelloides Tiegh; M. hiemalis Wehmer.	
(1/2)	Without chemicholdes Flegh, W. memans weimher.	
Alternaria	Alternaria alternata Keissl; A. tenuissima Wiltsh.	
(1/2)	Alternaria alternata Keissi, A. tenuissima wiitsii.	
Rhizopus	Rhizopus arrhizus Fischer.	
(1/1)	Kinzopus arrinzus Fischer.	
Oidiodendron	Oidiodendron echinulatium Bainier.	
(1/1)	Oldiodendion echindratium banner.	
Aureobasidium	A1'1'	
(1/1)	Aureobasidium pullulans Arnaud.	
Paecilomyces	Pageilomyggs variatii Rainiar	
(1/1)	Paecilomyces variotii Bainier.	
Trichoderma	Trichoderna, viride Pers.	
(1/1)	Thenouema, viriue reis.	

P. claviforme due to Penicillium specie, C. cladosporioides, C. herbarum due to Cladosporium specie, P variotii due to Paecilomyces specie, M. circinelloides due to Mucor specie, Rh. arrhizus due to Rhizopus specie were widely spread. The species such as Al-Aureobasidium ternaria alternata, Trichoderma viride, Oidiodendron echinulatium having pa characters can be come across in the kindergardens as well. The above mentioned fungi, especially conventional pathogenes, being easily adhessed on the skin of the children with weakened immune system, who spend most part of their time in the kindergardens, are transformed into aggressive originators of invasive mycoses.

Conclusions. Thats why in particular, atmospheric air of the kindergardens functioning on the ground floor of modern residential complexes or in the independent single-room buildings is potentially converted to the source of infection of mycotic deseases. So this highly increases the chances of the children with weakened immune system to be catched by allergy and mycotic deseases. So with the aim of health protection of kids its quite necessary to hold micological monitorings in the kindergardens located on the ground floor of modern residential complexes or in singleroom buildings with remarkably high humidity factors.

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ECONOMIC SCIENCES

CONCEPTS OF CIRCULAR ECONOMY AND POSSIBILITIES OF ITS APPLICATION IN KAZAKHSTAN

Abezhanova A.,

Doctoral student of the Higher School of Economics, Astana International University

Smagulova Z.

PhD, Professor, the Dean of the Higher School of Economics,
Astana International University,
https://orcid.org/0000-0003-3759-5741
https://doi.org/10.5281/zenodo.7878308

Abstract

This article discusses the basic concepts of the circular economy. The principles and characteristics of its development are researched on the examples of other countries of the world. It has been established that in Kazakhstan the transition to a circular economy is at the initial level and has the possibility of its development in priority sectors of the economy, determined by legal norms.

Keywords: Circular economy, natural resources, environment, recycling, reuse.

The modern period of development of the world economy is characterized by both accelerated and unstable trends, which are also explained by such an important circumstance that in recent decades more and more different kinds of natural resources, energy and materials have been produced and used, and the problems of ensuring the preservation of the environment are becoming more and more important factors, provided that they directly affect the conditions for further social development. The world economy and the world community are facing global requirements, which are manifested every year more and more systematically, as they are in need of a comprehensive solution. According to a number of international funds, the current global crisis is long and very deep, as it affects all countries of the world and not only sectors of the economy, but also the living conditions of people on the planet. The indicators of the stability of the world economy are negatively affected by the environmental and social directions of its development. It should also be noted that the natural reserves of our planet and each state individually are being depleted as a result of the increased consumption of available resources. This approach also leads to climate change on the planet, to environmental problems associated with environmental pollution. The following conditions oppose this situation: the optimization of production, which makes it possible to prevent the depletion of available natural resources, as well as modern economic concepts, which are trends such as the system of conscious consumption and the circular economy.

Based on this, it should be emphasized that the above reasons indicate the importance of implementing in all countries the concept of a circular economy, which is beginning to gain more importance all over the world, since the traditional economy, known as the linear economy, cannot solve all the problems of modern sustainable development. the world community, requiring simultaneous integrated development, expressed in the following:

- 1) sustainable economic growth;
- 2) ensuring environmental protection;
- 3) ensuring public welfare.

A similar situation is noted in Kazakhstan, which is part of the world economy, and it requires its correct solution. In the current situation, it is essential to find scientific economic approaches that allow the formation of more efficient economic systems, characterized by a high level of sustainability and created on the principles of a careful and reasonable attitude to the environment and resource conservation. Based on this, in the course of this study, the importance of studying the concepts of a circular economy, the economic factors of its development in modern conditions, based on scientific findings and practical results in this area, is determined. And it is also necessary to consider the indicators of its development in Kazakhstan and develop recommendations for their use in our republic. At the same time, special attention is paid to issues that show how, in the conditions of the modern development of the Kazakhstani economy, it is most effective to promote the principles of the circular economy, in which areas it is necessary to focus special attention and whose world experience can be adopted.

At the first stage, we considered the basic concepts of the circular economy.

A circular economy (or cyclical) is an economic phenomenon, according to which consumption and production take place in a certain closed cycle. Within this cycle, three conditions must be taken into account:

- 1) maximum use of resources;
- 2) no accumulation of waste;
- 3) no negative impact on nature [1].

The circular economy is opposed to the classical linear economy, which operates according to the following principle: take, make, dispose ("create, use, destroy waste") [1]. The concept of the circular economy is based simultaneously on the achievements of two scientific branches: economics and ecology. The concept

is based on the assumption that only alternative methods of production can compensate for the negative impact of production and consumption on the environment

The circular economy as a concept appeared for the first time in the 60s of the twentieth century. Its first definition was proposed in 1966 by Kenneth Boulding, an economist from the United States. According to the author, the economy and the environment require interaction and must develop harmoniously and in a certain balance. His definition of a circular economy is based on harmonious interaction [2].

It should be noted that the conceptual concept and content of the circular economy began to be explored and discussed since the late 60s of the twentieth century. However, to date, the concept itself is still developing and enriched with new approaches. Let us show how the idea of a circular economy was revealed, supplemented and changed in the scientific community, using some examples. In the 70s of the last century, it was started talking about the circular economy relatively actively, mainly in individual European countries; there they began to offer a circular model of the economy to replace the industrial model, which directly depended on the active use of raw materials.

In 1970, Pearce and Turner considered the twosided influence of natural resources on the economy, since they affect economic systems and determine their efficiency and development [4]. In 1989, it is noted that the traditional or linear economy (David Pearce and R. Kerry Turner) does not take into account the recycling of waste, which has created conditions according to which the environment becomes simply a repository for waste. Their concept of a circular economy is based on the analysis of the influence of natural cyclical mechanisms, including the environment [3].

The concept of cradle-to-cradle zero-waste production (McDonough and Braungart, 2002) is based on the need to develop and implement an independent certification system that is designed to assess the safety of products based on the production materials and technologies used in their creation. This concept is based on the certification of non-waste production, which allows to promote certified products [4]. The concept of systemic change (Preston, 2012) is based on collaboration

along the entire customer value chain between all or different participants. This is due to the fact that the introduction of a circular economy involves systemic changes [4]. The concept of a circular economy (European Commission 2014), according to which production should be transformed into a new industrial model that can support the transition of industrial production to a different economic model. According to this concept, the circular economy is based on the principle of creating such a closed system in which the economy and the environment are related [4]. The concept of the circular economy is based on the fact that it is possible to ensure economic growth regardless of the extraction of natural resources. It is also based on the possibility of forcing resources through the continuous use of materials (Persson, 2015), which can, regardless of the extraction of resources, only through their processing and reuse, affect economic growth [4]. The concept of a circular economy as an economic system implies a complete change in the scientific paradigm (Prieto-Sandoval et al., 2018). According to this concept, the definition and principles of the circular economy are formed, based on a review of existing concepts and systematic research on this topic [4].

This allows us to stop at the definition of the circular economy, given in 2018 by Prieto-Sandoval et al., as an economic system that acts as a paradigm shift, according to which human society and nature are interconnected and human activities are aimed at preventing environmental pollution, depletion of resources, ensure the reduction of resource and energy dependence. The circular economy promotes general and private sustainable development through the introduction of new principles at the micro level (consumer and enterprises), meso level (symbiosis of economically integrated agents) and macro level (city, regions and states). According to the authors, in order to achieve a cyclical model of the economy, systemic ecological innovations of a restoring plan and the adoption by society of new laws of production and consumption are required [4]. This definition, in our opinion, is the most complete and fully reflects the most important elements and aspects that characterize the circular economy. The circular economy is determined by the main principles reflected in Figure 1.

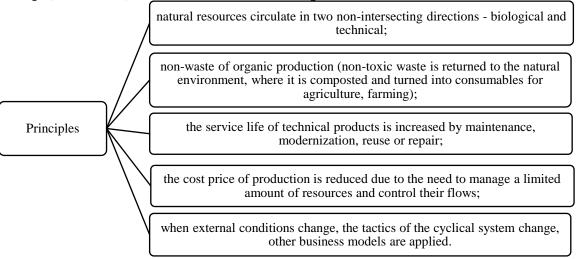


Figure 1. Principles of the Circular Economy [5]

The circular economy is also based on the implementation of the 4R principle, which provides circular value chains: reuse, recovery, recycle, reduce (reduction in resource consumption in production). In a circular economy (hereinafter, CE can be used) there is a

closed supply chain, which, as its main factor, involves both direct and re-production, as well as reverse logistics, as indicated on the CE model in Figure 2.

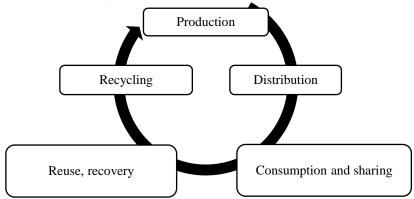


Figure 2. Circular economy model [6]

According to this model, previously produced products are returned after their consumption to secondary production. At the same time, the manufacturer is obliged to guarantee the restoration of the product or its disassembly into separate elements for secondary

Thereby, natural raw materials are not wasted again and energy is not wasted, in addition, the processing of materials does less harm to the environment, and the finished product produced from recycled materials has a lower cost.

As a result, the following are identified as the main objectives of the circular economy:

- 1) optimize the activities of economic entities through more appropriate methods of using resources;
- 2) organize a sustainable production cycle that allows more efficient use of existing production capacities;
 - 3) ensure the pace of economic growth;
- 4) develop other economic directions (replenishment of natural resources, development of the labor market, etc.) [7].

At the second stage, we analyzed the experience of using the circular economy in the world at the present stage. At the same time, it should refer to the opinion of Klaus Schwab, an economist from Germany and president of the WEF in Davos, about the importance of a circular economy, since in the modern period the development of the economy as a whole is accelerating, and in a circular economy it becomes more predictable. In addition, in the West, Industry 4.0 (Fourth Industrial Revolution) is recognized as the basis for the transition to a circular, economy, since all aspects of human life and the functioning of production change with the spread of new technologies in the world (robotics, digitalization, artificial intelligence, the universal Internet). The mass introduction of the latest technologies has led to the realization of the importance of proper consumption and rational use of raw materials and energy, which reduces the anthropogenic impact on the environment.

This concept has found its distribution as part of the global strategy for sustainable development until 2030. It is described in a policy document adopted in 2015 by the UN (the main provisions are taken from the report "The Limits to Growth" by Dennis Meadows and co-authors, announced in the 80s of the last century). The UNO has identified the following ways to achieve global balance, arising from the principles of the circular economy: saving resources and optimizing energy, developing ecological methods of obtaining energy, introducing innovative technologies in all spheres of life, preserving the ecosystem, combating climate change and environmental degradation, ensuring rational production and consumption to reduce the volume of household landfills and waste, the consistency of all countries of the world in the planetary interests [8].

Analysis of foreign experience has shown that many countries prefer the circular economy as a new model of economic development. Countries adopt the concept of a closed cycle, both in general and in various areas of the economy, based on the priorities of socioeconomic development. As a example, Germany introduced the concept of a circular economy one of the first, primarily in environmental policy. The United Kingdom and Denmark have introduced the principles of a circular economy in the field of waste management - in doing so, they want to create a zero-waste society in the country. The European Union in 2015 presented its action plan for the widespread introduction of the circular economy. This approach has accelerated the transition of EU countries to a circular economy. As a result, the following principle of the circular economy has been defined in the EU - following natural cycles through renewable energy sources.

The concept of a circular economy is being actively implemented in the Scandinavian countries.

Norway Government's ambition is to play a pioneering role in the development of a green, circular economy that makes better, more efficient use of resources. Norway will play this role by further developing policy and policy instruments both nationally and in cooperation with the EU, to develop a framework for value creation and green competitiveness in Norway. The strategy will underpin the Government's efforts to exploit the potential for value creation in Norwegian

business and industry more fully, with a more circular economy as the basis. It includes specific action points for the sectors that have been identified as having the greatest potential for circularity and green competitiveness in Norway: the bio-based sectors; the process industries; construction and buildings; and service industries, including retail and wholesale trade. [9].

Especially in Sweden, where the circular economy has become a national idea, supported not only by the state, but also by the people. So, for example, everyone can even hand over household waste such as batteries, light bulbs, small electronic gadgets, headphones, and so on in some Swedish supermarkets. The delivery of garbage is motivated in the form of a "deposit" system when buying a drink in a plastic, glass or aluminum bottle or can: the drink and packaging are paid separately. Upon return of the package, the deposit is returned, it can be spent in the same store or used in a charitable plan for the environment. In Sweden, from kindergarten, they begin to conduct environmental education and teach, for example, sorting garbage, making compost, and so on. For air travel in Sweden compensate for carbon dioxide emissions, and the proceeds are invested in the construction of wind or solar power plants. Taxes on non-green things (cars) and bonuses for eco-friendly things or actions (bicycles, scooters, walking) have been introduced in the country. In Sweden, literally everything is made from recycled waste: furniture, dishes, and so on.

In Scotland, there is a closed cycle in certain sectors of the economy, for example, in the textile sector, it is based on the "zero waste" principle. The government is interested in this approach and supports the achievement of similar goals, which are set for all waste in Scotland: to achieve 70% recycling by 2025 and a maximum of 5% waste disposal. The program was launched by the government on 9 June 2013 and is expected to generate £2.9 billion in potential savings through simple resource efficiency.

In China, the transition to a circular economy is also supported by the state, and this process is regulated by a special law. The result of this approach is the development of alternative energy in the country, both wind and solar. It should be noted that China was the first to use the concept of a circular economy when creating eco-industrial parks. Also in China, industrial projects are being actively implemented to create low-carbon cities, to introduce various kinds of nanotechnologies, and so on.

In South Korea, the circular economic system is included in the national economic development strategy of the country. At the same time, the economic development of the country is aimed at creating such branches of a closed economy as the creation of alternative engines and vehicles, the use of methods for the harmless processing of all types of waste, the purification of sea and fresh water, the development of state environmental projects and the active involvement of the population and business in them.

In Japan, they are actively and diversified fighting environmental pollution (water and air) within the framework of the circular economy, taking many measures to minimize methane emissions from farming and waste processing. Japan has developed safe technologies for the utilization of methane and other harmful substances, for the manufacture of new materials while reducing the use of harmful substances in industrial production. It should also be noted the contribution of the Japanese government, which is implementing projects to protect the biosphere (on land and in the ocean) from black carbon and methane emissions. They also offer their technologies to other states - developing Asian countries [10].

The environmental benefits that countries are receiving from the circular economy are as follows: greenhouse gas emissions are reduced (halving from 2018 to 2030 is planned), soils are becoming healthier and more resilient (soil degradation costs about \$40 billion per year). The economic benefits are as follows: an increase in the potential for economic growth (increase in GDP), an increase in saved resources (up to 70%), an increase in employment (creation of new jobs). Thus, it is planned, for example, to create about 50 thousand jobs in the UK and 54 thousand new jobs in the Netherlands. Benefits of the circular economy for business: the emergence of new profit opportunities, reduced volatility and reliability of supply, increased demand for new services. These primarily include companies engaged in waste collection and reverse logistics, enterprises for the return to the system of end-oflife products, companies for the restoration of components, parts and finished products, companies that sell new products and digital sales platforms and some other.

At the third stage, an assessment was made of the documents of the concept of the circular economy developed in this area in Kazakhstan. In the Republic of Kazakhstan, the concept of a circular economy has not been officially approved; some of its provisions were first disclosed in the concept of sustainable development until 2024. Then, in Kazakhstan, the concept of a green economy was developed, which notes such a task, based on the principles of a circular economy, as mitigating pressure on the environment. This concept states that by 2030-2050 the national economy of the country should switch to the use of natural resources on the basis of sustainability and renewability [11].

In the Strategy for achieving carbon neutrality until 2060, which was developed in the Republic of Kazakhstan, the circular economy is one of the principles for its implementation and is as follows: a circular economy is an economy based on reducing consumption and using secondary resources. Other principles include phased implementation, openness and public interaction, and balance. Sectoral low-carbon development based on the closed cycle economy is directed to Kazakhstan in such sectors as energy, industry, agriculture and forestry, waste management. A fair transition to a new form of economy, support for green investments, the formation of a new public consciousness, and so on are defined as cross-cutting approaches to such development [12].

Based on the above strategy, the basic principles of the circular economy in energy, industry, agriculture and forestry and waste management are involved in Kazakhstan. There is a gradual transition to a circular

economy.

The transition to a circular economy in the Republic of Kazakhstan is designed to solve such important and existing problems in the country as:

- 1) processing of industrial waste and their reuse (such waste is mainly emitted by mining enterprises);
- 2) processing of collected household waste or their environmental disposal (household waste of the population and certain types of enterprises);
- 3) purification of water resources and their reuse (resources of water-deficient regions of the country).

According to statistics, in Kazakhstan, the processing of industrial and household waste is growing, but has insignificant volumes. Thus, over the past five years, about 15-18% of 4 million tons of waste has been processed MSW (municipal solid waste) in the country, and the share of industrial waste disposal and processing is slightly higher - more than 30% (there is no division of processing and disposal). These are very low index compared to Western countries. The greatest activity in this direction can be traced in the cities of Almaty and Astana and in regional centers, it is differentiated unevenly and across the regions of the country. In Kazakhstan, the number of companies dealing with MSW is growing, but they are still few. There are no statistical calculations on the level of MSW processing and the inclusion of industrial and other enterprises in the circular economy. The main sectoral types of waste circulation in Kazakhstan are enterprises for the processing of paper, polyethylene glass and food waste. The least developed enterprises in Kazakhstan are processing textiles, non-ferrous metal scrap and wood. There are facilities that specialize in the recycling of batteries, automotive components, tires and used oils. Enterprises for the processing of waste electronic and electrical equipment are developing [13; 14].

Thereby, we have considered the main concepts of the circular economy and foreign experience. The main strategic documents, according to which a circular economy is developing in Kazakhstan, and some statistical data have been studied. It has been established that in Kazakhstan so far only a transition to a closed cycle economy is taking place. It is recommended in Kazakhstan to use the experience of European countries, which at the national level have included the principles of a circular economy in their strategic documents for sustainable development, have created special funds and effective platforms. The Japanese experience also deserves special attention, as a resource-constrained country was able to transition to a highly efficient closed economy through a law passed in 2000 to promote the efficient use of resources. This approach has allowed Japanese businesses to recycle up to 98% of their used metal waste and 90% of their old electronics waste. As a result, almost all materials used in Japan are returned for recycling and remanufacturing.

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IMPROVING THE VAT ADMINISTRATION SYSTEM IN UKRAINE TOWARDS ADAPTATION TO EUROPEAN STANDARDS

Sushkova O.

PhD (Economics), Associate Professor, Associate Professor for the Department of Customs and Commodity Science, State Tax University (Irpin, Ukraine); Guest researcher, the Institute for Austrian and International Tax Law, Vienna University of Economics and Business (WU) https://doi.org/10.5281/zenodo.7878310

Abstract

In the article it was investigated the functioning mechanism of e-invoicing in Ukraine, which made it possible to identify key problematic areas in its work. Taking into account the European integration path of Ukraine, the European rules for the VAT administration were studied, as well as the best practice of the e-invoicing operation among the EU Member States was investigated. Taking into account European standards and best practices, ways for improving e-invoicing in Ukraine were outlined.

Keywords: VAT, invoice, tax administration, e-invoicing, validation

1. Introduction.

Value added tax is a key element of the tax system of Ukraine. This, on the one hand, is due to its fiscal significance for the budget of Ukraine, because this tax ranks first in the structure of tax revenues and ensures the accumulation of more than 30% of the revenue part of the consolidated budget of Ukraine. And on the other hand, the biggest tax gaps in the Ukrainian economy are specific to VAT, which is the result of the presence of a large number of schemes for minimizing and evading the payment of this tax. According to experts' estimates, the Ukrainian budget does not receive about UAH 30 billion annually due to the existence of fraudulent VAT schemes, and the most widespread scheme called "scrolls" ranks fourth in terms of the level of influence on the amount of tax revenues in the budget of Ukraine [25].

However, one of the most effective tools for reducing VAT gap and combating VAT fraud is the efficient operation of the VAT administration system. As the world practice proves, VAT has a sizeable fiscal potential, thanks to which it can allow the accumulation of additional tax revenues in the budget and reduce tax gaps with VAT, only at the expense of increasing the efficiency of the system administration of VAT, without increasing the tax rate [27, p. 8]. At the same time, the effective functioning of the administration system is considered mainly from the point of view of the widespread use of modern digital technologies, which allow reducing the influence of the human factor on decision-making on both sides – the tax administrations and taxpayers - and ensure tax compliance. In this case, the applying of an automated VAT administration system becomes of practical importance.

The automated VAT administration system, which includes the operation of the Unified Register of VAT invoices and adjustments calculations to them (hereinafter referred to as the Unified Register), has been used in Ukraine since 2011. During its operation, this system has undergone thousands of improvements and changes, but despite this, the system still has a large number of shortcomings and debatable points, which

cause taxpayers to be dissatisfied with its use and increase the number of conflicts (court cases) between taxpayers and tax administrations. At the beginning of 2023, the State Tax Service of Ukraine again made changes to the procedure for the functioning of the Unified Register, but they mostly have "cosmetic" role and do not fundamentally transform the VAT administration procedure in Ukraine, leaving controversial issues.

Besides that, undergoing numerous changes to the procedures of the VAT electronic system in Ukraine does not contribute to the improvement of its work and has a destructive effect on the business activity of taxpayers, a number of VAT administration procedures are at odds with the key principles provided for by the EU tax law, in particular for VAT. Since the declaration of independence, Ukraine has chosen the European integration path of development and the European standards became future guidelines for the development and functioning of the Ukrainian economic system, in particular the tax system. On the other hand, Ukraine received the status of a candidate for the EU membership in 2022, thus intensifying the process of integration into the EU. So, the prospect of future integration dictates the need for maximum approximation (adaptation) of the Ukrainian public administration system and in particular a tax administration system, to the European standards and practices. However, every large-scale innovation in the tax system or the tax administration system leads to certain losses for both the state (in the form of uncollected tax revenues, budget expenditures for financing changes in the tax system, etc.) and taxpayers (fines in the first the period of operation of new rules, costs for adapting technical capabilities to new requirements, etc.). Therefore, in order to minimize the deadlines and probable consequences (financial losses) from reforming and adapting the system to new rules after Ukraine acceded to the EU, we believe that it would be rational if Ukraine already starts the process of improving its VAT electronic administration system to bring it closer to the standards and principles of operation of a similar system in the EU.

2. Goals, Objectives and Methodology.

Due to the above arguments, the goal of the article is to determine proposals to improve the work of the electronic VAT administration system in Ukraine, taking into account the EU standards.

To achieve this goal, several scientific tasks have been solved in this article. We carried out a critical analysis of the work of the electronic system of VAT administration in Ukraine and in particular the automated system of registration of VAT invoices and adjustment calculations. It helped identify the key short-comings in its work. Also, we investigated the main provisions of the EU VAT Directive, key principles of building the EU tax system, and the existing practice of VAT administration in the EU, as well as the results of use of the electronic invoice registration system in some EU Member States.

The results of these two analyses allowed the author to identify the key problematic issues in the work of the electronic system of VAT administration in Ukraine and inconsistencies with the main principles of VAT taxation in the EU. Regarding each point of problematic questions, we formulated proposals for improving the Ukrainian VAT administration system, especially in terms of registration of VAT invoices, to adapt it and bring it closer to European standards.

3. Results.

3.1. Characteristics of the systems of electronic VAT administration in Ukraine.

The electronic system of VAT administration was introduced in Ukraine in 2011 in accordance with the Resolution of the Cabinet of Ministers of Ukraine No. 1246 dated 29.12.2010 "On approval of the Procedure for maintaining the Unified register of VAT invoices", which defines the mechanism for entering information contained in the VAT invoice or calculating adjustments to the Unified Register [28]. According to this mechanism, the VAT taxpayer independently prepares a VAT invoice or the calculation of adjustments in electronic form in accordance with the standard approved by law and sends it for registration in the Unified Register. After the VAT invoice is received by the tax administration, the following aspects are deciphered and checked in an automated mode:

- compliance with the VAT invoice with the approved format (standard);
 - the validity of the qualified electronic signature,

the procedure for its imposition, and the availability of the right to sign such VAT invoice by an official of the taxpayer;

- registration of the person who sent the VAT invoice for registration as a VAT taxpayer at the time of drawing up and registering such VAT invoice;
- compliance with the requirements established regarding the terms of adjustment of the amounts of the VAT obligations and VAT deductions (Article 192.1 and Article 201.10, Tax Code of Ukraine [33]);
- the presence of errors when filling in the mandatory details;
- availability of the appropriate amount on the special VAT account (the limit for registering a VAT invoice), calculated by Article 200⁻¹.3 and 200⁻¹.9 of the Tax Code of Ukraine ¹;
- availability in the Unified Register of information contained in the VAT invoice, which is being adjusted;
- the fact of registration/suspension of registration/refusal to register a VAT invoice with the same details:
- if there are grounds for stopping the registration of VAT invoices (risk monitoring).

The VAT administration system in Ukraine also provides for the VAT taxpayer to open a special electronic account at the State Treasury Service of Ukraine for VAT accounting. Thus, since 2016, by the Resolution of the Cabinet of Ministers of Ukraine No. 1177 dated 30.12.2015 [23], the State Treasury Service of Ukraine, based on the Register of VAT Taxpayers data, automatically and free of charge opens an electronic VAT account for each VAT taxpayer. The electronic VAT accounts are used for the automatic debiting of VAT amounts payable by the VAT taxpayer to the country's budget based on the results of its activities during the reporting month. At the same time, the payment of fines and penalties is made by the VAT taxpayer from the taxpayer's bank account. In case of cancellation of the registration of a VAT taxpayer, the State Treasury Service of Ukraine based on updated data in the Register of VAT Taxpayers automatically closes the VAT account of such a taxpayer and transfers the remaining funds to the country's budget.

Transfer of the amount of VAT payable by the VAT taxpayer based on the results of the month reporting to the country's budget takes place automatically

 $\sum \text{Invoices} = \sum \text{InvoicesIn} + \sum \text{Customs} + \sum \text{Replenishment} + \sum \text{InvoiceOut} + \sum \text{Partial} + \sum \text{InvoiceOut} + \sum \text{Partial} + \sum \text{InvoiceOut} + \sum \text{Partial} + \sum \text{InvoiceOut} + \sum \text{Partial} + \sum \text{InvoiceOut} + \sum \text{Partial} + \sum \text{InvoiceOut} + \sum \text{Partial} + \sum \text{InvoiceOut} + \sum \text{Partial} + \sum \text{InvoiceOut} + \sum \text{Partial} + \sum \text{InvoiceOut} + \sum \text{Partial}$

 \sum Overdraft - \sum InvoiceOut - \sum Refund - \sum Excess. \sum InvoiceIn - the total amount of VAT according to the tax invoices received by the VAT taxpayer, registered in the Unified Register.

 Σ Customs – the total amount of VAT paid by the VAT tax-payer during the import of goods/services to the customs territory of Ukraine and is determined based on the data of customs declarations.

∑Replenishment – the total amount of replenishment of the electronic VAT account from the current account of the VAT payer. This amount is reduced by the amount of excess balances on the electronic VAT account, which were returned to the current account of the VAT taxpayer in accordance with

the application submitted by him (but only until this indicator reaches zero).

 \sum Overdraft – the sum of the average monthly amount of VAT amounts that were declared by the payer to be paid to the budget for the last 12 reporting months and repaid (in installments, deferred). This indicator is subject to automatic recalculation every quarter.

∑InvoiceOut – the total amount of VAT according to tax invoices issued by the VAT taxpayer, registered in the Unified Register.

 \sum Refund – the total amount of VAT declared by the VAT taxpayer before the budget refund.

∑Excess – the total amount of the excess of tax liabilities, indicated by the VAT taxpayer in the VAT reporting submitted to the tax authority, over the amount of VAT indicated in the tax invoices drawn up by such taxpayer, registered in the Unified Register.

¹ The VAT taxpayer has the right to register tax invoices in the Unified Register for the amount of VAT (indicator ∑Invoice), calculated according to the following formula:

based on the data of the VAT reporting submitted by him. If on the date of submission of the VAT reporting, the balance of funds in the electronic account of the VAT taxpayer exceeds the amount of VAT payable to the budget, the taxpayer has the right to submit, as part of this reporting, an application for the transfer of the such balance of funds to the bank account of this VAT taxpayer. If there are not enough funds in the electronic account, the VAT taxpayer must transfer the insufficient funds from his own bank account to the electronic account before the deadline for the payment.

As can be seen from the list of directions for checking VAT invoices before their registration in the Unified Register, the conditional balance on the electronic account of the VAT taxpayer is used to determine the limit for registering a new VAT invoice ². According to the formula for calculating this limit, if a VAT taxpayer applies for a VAT refund, this amount of the claimed refund reduces the amount of the limit for registration of VAT invoices. If the specified conditional balance (according to the calculation formula) on the electronic VAT account is insufficient during the registration of the VAT invoice, the VAT taxpayer can top

up this account. Accordingly, a VAT taxpayer who has applied for a VAT refund, but has not yet received this amount, will be forced to withdraw additional funds from circulation and transfer them to an electronic VAT account to ensure the registration of other VAT invoices and the fulfilment of obligations to their buyers. Although according to Resolution No. 1177 [23], the VAT taxpayer has the right to receive information from the tax administration about the status of his electronic VAT account (menu "Transaction Register") and the amount of VAT for which he has the right to register VAT invoices in the Unified Register using the information and telecommunications system "Electronic Cabinet", this procedure of registration of VAT invoices only burdens the mechanism of functioning of the electronic VAT administration system, creating both new obstacles for VAT taxpayers and new objects of control for tax administrations.

Risk monitoring involves an assessment of the riskiness of the VAT taxpayer according to established criteria ³, an assessment of his tax history ⁴, and an assessment of the degree of riskiness of the operation ⁵

- 1. The VAT taxpayer was registered (re-registered) on the basis of invalid (lost) and forged documents according to the information available in the government authorities.
- 2. The VAT taxpayer was registered (re-registered) in the state registration authorities by natural persons with subsequent transfer (registration) to the possession or management of non-existent, deceased, missing persons according to the information available in the government authorities.
- 3. The VAT taxpayer was registered (re-registered) in the state registration authorities by natural persons who did not intend to conduct financial and economic activities or exercise powers, according to the information provided by such persons.
- 4. The VAT taxpayer was registered (re-registered) and conducted financial and economic activities without the knowledge and consent of its founders and legally appointed managers in accordance with the information provided by such founders or managers.
- 5. The VAT taxpayer a legal entity does not have open accounts in banking institutions, except for accounts in Treasury bodies (except budget institutions).
- 6. The VAT taxpayer did not submit VAT tax returns for the last 2 reporting periods to the tax authority, contrary to the provisions of the Tax Code of Ukraine. (Clause 6 with changes introduced in accordance with Resolution of the Cabinet of Ministers No. 1428 of 12/23/2022)
- 7. The CIT payer did not submit financial statements for the last reporting period to the tax authority, contrary to the provisions of the Tax Code of Ukraine. (Clause 7 with changes introduced in accordance with Resolution of the Cabinet of Ministers No. 1428 of 12/23/2022)
- 8. The tax authority has tax information that became known in the course of the current activity during the performance of the tasks and functions assigned to the tax authority, which determines the riskiness of the transactions specified in the VAT invoice submitted for registration.
- The VAT taxpayer receives a decision on compliance with the risk criteria of the VAT taxpayer through the Electronic Cabinet on the day of making such a decision.
- ⁴ VAT taxpayer has a positive tax history if one of the following criteria is met:

- 1) the amount of supply indicated by the taxpayer in the tax invoices registered in the Unified Register in the current month does not exceed UAH 1 million, provided that the amount of supply of goods/services in the current month in transactions with one recipient the VAT taxpayer does not exceed UAH 100,000, and the manager an official of such a VAT taxpayer is a person who holds a similar position in no more than three (inclusive) VAT taxpayers;
- 2) during any 4 reporting months out of the last 6, the taxpayer permanently registers invoices in the Unified Regirter for the supply of goods/services with the same product/service code in accordance with the UCG FT/DCGP;
- 3) the residual value of fixed assets for income tax payers at the end of the reporting period is more than UAH 5 million, provided that the manager and founder have not changed since the beginning of the previous year;
- 4) the presence of own (right of ownership / use), leased land plots of more than 200 ha inclusive or the presence of leased land plots of communal and/or state property with an area of at least 0.5 ha (as of January 1 of the current year), declared by 20 February of the current year;
- 5) for the last 12 months, the payment of a single insurance contribution per 1 employee exceeds the amount of the minimum wage by 2 times, provided that the manager and/or founder has not changed since the beginning of the previous year and the average monthly salary for the last 12 months the number of employees is at least 5 people;
- 6) the total amount of VAT and taxes and fees paid in the previous reporting year (except for the amount of import VAT) by the taxpayer and its separate divisions, which submitted the invoices for registration in the Unified Register, amounts to more than UAH 10 million.
- ⁵ Criteria for risky transactions:
- 1. The volume of the supply of goods/services, specified in the tax invoice submitted for registration in the Unified Register for increasing the amount of tax liabilities, is equal to or exceeds the value of the balance, which is defined as the difference between the volume of acquisition of such goods/services in the customs territory of Ukraine (except for the volume of acquisition of goods/services under transactions that are exempt from taxation and subject to taxation at a zero rate) or importation into the customs territory of Ukraine of such goods specified in the received tax invoices registered in the Unified Register, and customs declarations, increased by 1.5

² See footnote 10 (index Σ Invoice).

³ Criteria for risky VAT taxpayer:

for which the VAT invoice has been drawn up. However, it should be noted that by the Cabinet of Ministers Resolution No. 1428 dated 23.12.2022, VAT invoices for which the volume of supply does not exceed UAN 5,000 are excluded from the range of VAT invoices, which are subject to risk monitoring before their registration in the Unified Register.

According to the results of the verification of the information specified in the VAT invoice, which is registering, by the criteria indicated above, an electronic receipt is generated in an automated mode on the acceptance, non-acceptance, or stop of registration of the VAT invoice and is sent during the operating day to:

- 1) to the seller (supplier) and the buyer (recipient) at the same time in case of registration of a VAT invoice;
- 2) to the VAT payer (supplier) in case of non-acceptance of the registration of the VAT invoice. Such a receipt must contain a list of the reasons for such non-acceptance;
- 3) to the seller (supplier) and the buyer (recipient) at the same time in case of stopping the registration of VAT invoice.

The information and telecommunications system "Electronic Cabinet" has a "Monitoring Invoice/AC" menu, which provides VAT taxpayers with access to the indicators used when the VAT invoices or AC registration is stopped in the Unified Register, namely:

1) indicators D and P – the indicators by which the Automated VAT Administration System varies the information provided by the VAT taxpayer and determines whether he can count on "immunity" from the blocking of VAT invoices. According to paragraphs 3

and 4 of the Resolution of the Cabinet of Ministers of Ukraine No. 1165 dated 11.12.2019 [24], VAT invoices are not subject to monitoring and are subject to registration in the Unified Register (unconditional registration), if at the same time indicators D (an indicator of the actual total tax burden of the taxpayer) and P (an amount of VAT which registered for the current reporting month) have the following values: D > 0.05; $P < Pm x 1.4 ^6$.

2) indicators of a positive tax history (PTH) – a system of criteria for a positive tax history of a taxpayer ⁷, which is defined by the norms of the Annex to the Resolution of the Cabinet of Ministers of Ukraine No. 1165 dated 11.12.2019 [24].

However, it should be noted that within the functioning of the Ukrainian automatic system of VAT administration, there is a "section of work" that is performed by a special commission consisting of employees of the tax administration (at the regional level, in some cases at the central level). So, when according to the results of automated monitoring a VAT taxpayer who has drawn up and/or submitted a VAT invoice for registration in the Unified Register meets at least one criterion of the VAT taxpayer riskiness 8, or the operation of the taxpayer meets the riskiness criteria 9, the registration of such VAT invoice stops. Then, based on the additional information received (by means of electronic communication) at the request of the taxpayer, the above-mentioned commission makes a decision to exclude the VAT taxpayer from the list of risky or recognize the operation as not risky.

Documents accepted by the commission for consideration of the issue of excluding a VAT taxpayer

times, and the volume of supply of the corresponding goods/services specified in the tax invoices registered in the Unified Register. { Paragraph 1 in the wording of Resolution of the CM No. 1428 of 12/23/2022}

- 2. Absence (cancellation, suspension) of licenses issued by licensing authorities certifying the right of the VAT taxpayer to manufacture, export, import and wholesale trade in excisable goods (products), in relation to the goods specified by the VAT taxpayer in the tax invoice submitted for of registration in the Unified Register on the date of their completion.
- 3. Absence of information (up-to-date record) in the Unified Register of excise taxpayers on the sale of fuel on the date of drawing up the tax invoice in relation to the business entity that submitted the tax invoice for registration in the Unified Register, in which the goods (fuel) by codes according to UCG FT.
- 4. Compilation of the RK by the supplier of goods/services to the tax invoice drawn up for the recipient the VAT payer, if a change in the nomenclature of the goods/service is envisaged (for goods by codes in accordance with UKTZED change of the first four digits of the codes, and for services by codes in accordance with the State of the product and service classifier the first two digits of the codes), provided that such a product/service is not specified in the RK submitted for registration in the National Tax Registry, in the data table of the VAT payer as a product/service that is supplied (provided) on an ongoing basis.
- 5. Exceeding the amount of compensation for the value of the goods/services specified in the calculating adjustment for the reduction of the amount of tax liabilities submitted by the recipient of such goods/services for registration in the Unified Register, over the amount of the balance, which is defined as the difference between the amount of purchase of such

goods/services in the customs territory of Ukraine (except for the volume of acquisition of goods/services for operations that are exempt from taxation and subject to taxation at a zero rate), specified by the supplier in registered in the Unified Register, compiled for the recipient of such goods/services, and the volume of supply, reduced by 1.5 times and specified by the recipient of those registered in the Unified Register for the supply of such goods/services. {Paragraph 5 in the wording of Resolution of the Central Committee No. 1428 of 12/23/2022}

6. Submitting for registration in the Unified Register the calculation of the adjustment for the reduction of tax liabilities to the tax invoice drawn up and registered by the supplier of goods/services to the non-VAT payer within a period exceeding 30 calendar days from the date of drawing up the tax invoice registered in the Unified Register without violating the limits the registration terms established by the Tax Code of Ukraine, except for the calculating adjustment to the tax invoice, which reflects transactions for the supply of electric energy (commodity subheading 2716 according to the Ukrainian Tax Code), the supply of natural gas (commodity subheadings 2705, 2709 and 2711 11 according to the Ukrainian Tax Code), the supply of heat energy (conditional product code 00401). {Paragraph 6 in the wording of Resolution of the CM No. 1428 of 12/23/2022}

⁶ The Pm indicator is the largest monthly amount of VAT specified in tax invoices registered by the taxpayer in the Register for the last 12 calendar months preceding the month in which the invoice was drawn up.

⁷ See footnote 13 (Criteria for positive tax history of tax-payer).

⁸ See footnote 12 (Criteria for risky VAT taxpayer).

⁹ See footnote 14 (Criteria for risky transactions)

from the list of risk VAT taxpayers include: 1) contracts, in particular foreign economic contracts, with the annexes; 2) contracts, powers of attorney, acts of the governing body of the VAT taxpayer, which authorize persons who receive products in the interests of the VAT taxpayer to carry out the transaction; 3) primary documents regarding the supply/purchase of goods/services, storage and transportation, loading, unloading of products, warehouse documents (inventory descriptions), including invoices, acts of acceptance and transfer of goods (works, services) taking into account the existing typical forms and industry specifics; 4) settlement documents and/or bank statements from personal accounts; 5) documents confirming the conformity of products (declarations of conformity, quality passports, certificates of conformity), the availability of which is stipulated by the contract and/or legislation; 6) other documents confirming non-compliance of the VAT taxpayer with risk criteria. Within seven working days, based on the results of the review of the documents submitted by the VAT taxpayer, the commission decides to exclude him from the list of risky.

The content of additional information from the taxpayer to recognize the transaction as not risky is defined in Clause 13 of Order No. 1165 [24] and includes information on the types of economic activity carried out by the taxpayer, a list of product codes (according to the Ukrainian classification of goods of foreign economic activity) that the payer supplies, buys, or imports, and/or service codes (according to the State Classifier of Products and Services) provided, received, or imported by the taxpayer, with explanations and references to the taxpayer's VAT reporting. Based on this information, within five working days, the commission concludes the registration of the VAT invoice in the Unified Register or a complete refusal to register it.

As an exception to the general procedure, it is possible to automatically take into account the provided information only for two categories of VAT taxpayers: 1) according to clearly defined criteria producers of agricultural products that receive a budget subsidy; 2) VAT taxpayers for whom indicators D > 0.02, P < Pmx 1.4 and who in the additional information indicated goods or services, the volume of supply of which according to the data of the Unified Register for the last 12 calendar months is more than 25% of the total volume of supply such taxpayer. Also, by Clause 22 of Order No. 1165 [24], the commission must automatically accept additional information from the taxpayer and accordingly decides regarding the registration of the VAT invoice in the Unified Register if the court decision annuls the commission's decision not to accept additional information from the taxpayer.

To illustrate the practical results of the functioning of such a "hybrid" (electronic with elements of manual control), we will provide statistical data on the administration of VAT in Ukraine. According to the official data from the State Tax Service of Ukraine [20], at the end of 12 months of 2022, there were 46,600 cases under consideration in courts of various instances for lawsuits against tax authorities in the amount of UAH 263.9 billion. At the same time, 8,400 cases were considered (18% of the total number of cases) for UAH

90.8 billion (34.4% of the total amount of all court cases), of which: were in favour of tax authorities -3.2thousand cases (including non-property disputes) (38.1% of the total number of cases considered) for UAH 36.7 billion (40.4% of the total amount of considered cases), and in favour of taxpayers -5.2 thousand cases (61.9% of the total number of considered cases) for UAH 54.1 billion (59.6% of the total amount of considered cases). The majority of cases involving taxpayers' claims against tax authorities belonged to the category of cases on recognition of invalidity of tax noticesdecisions on refusal to register a VAT invoice - 22.8 thousand cases (48.9% of the total number of court cases) for UAH 217.1 billion (82.2% of the total amount of the total number of court cases). However, 4,400 cases were considered (19.3% of the total number of court cases regarding the blocking of VAT invoice registration) for a total amount of UAH 55.2 billion (25.4% of the total amount of court cases related to blocking the registration of a VAT invoice), of which 2.2 thousand cases (50%) for UAH 31.1 billion (56.3%) were in favour of tax authorities. So as we can see, the electronic system of VAT administration in Ukraine, which is designed to simplify the process of tax administration, only creates additional conflicting issues, increasing mistrust among taxpayers in the tax administration and the tax system as a whole.

Thus, the Ukrainian VAT electronic administration system, on the one hand, is the first attempt to apply artificial intelligence in tax administration, and on the other hand, the VAT administration mechanism has a considerable element of manual management of the process of registering electronic invoices, which brings significant subjective (and means a possibly corrupt) aspect in the functioning of the system. In addition, the very mechanism of proving the transparency of the transaction, for which the VAT invoice is created, has a wide field for subjective (read corrupt) interpretation of the content or filling of "additional information" by employees of tax administrations. Such a functioning mechanism of the VAT electronic administration system completely defeats the purpose of tax administration automation in terms of minimizing the human (subjective) factor in decision-making by controlling bodies, increasing the objectivity and transparency of the tax administration system. This also affects the attitude of taxpayers to the tax system and tax administration of the country, determining the level of conscientious tax payment. As Shwabii K. says [29], taxes by themselves do not have a positive or negative colour, this colour is determined by the tax administration system and the mechanism of their budget distribution. Also, regarding the special VAT accounts, although they fulfil the role of guaranteeing the payment of VAT to the country's budget and minimize the fiscal risks of the state, but at the same time create additional obstacles for conducting business activities for VAT taxpayers (the VAT taxpayer withdraws part of the working capital to this account), violate rights and freedom (mobility) of taxpayers, which does not contribute to the formation of trust relations between VAT taxpayers

and tax administrations. This approach needs to be reviewed regarding the need for its application and/or improvement in accordance with European practice.

3.2. The VAT e-invoicing system in the European Union

3.2.1. General rules of the e-invoicing in the EU

The study of the European practice of e-invoicing was carried out in two directions – the identification of the key pillars of the EU legislation on VAT taxation and the main principles of the tax administration system, in particular in the field of VAT, and the key procedures that form the e-invoicing systems of individual Member States. This approach is due to the fact that the EU VAT legislation and principles of taxation form the framework in which the tax administration system of any Member State should function, and the procedures of tax administration reflect how in practice it is possible to ensure the achievement of tax goals within these frameworks.

The legal basis of VAT taxation in the EU is the VAT Directive [10], which regulates the procedure for determining the key elements of the VAT (taxpayers,

taxable transactions, exclusion from the list of taxable transactions, taxable amount, tax rates), rights and obligations of taxpayers and non-taxpayers, including regarding the procedure for issuing invoices, as well as the procedure for determining the place of implementation of taxable transactions, especially for cross-border transactions, and the mechanism for applying VAT taxation rules for special schemes and taxation regimes. Given the fact that the topic of this article is focused on the process of VAT administration, the investigation of the VAT Directive should be conducted with an emphasis on the rules for issuing VAT invoices and their validation by tax administrations. Thus, regarding the VAT invoicing process Articles 217-240 of the VAT Directive [10] provides a single set of basic EU-wide invoicing rules (Table 2). However, Member States have the possibility to deviate from the norms of the Directive under certain conditions and within certain limits to introduce special measures aimed at simplifying tax collection or preventing certain forms of tax evasion.

Table 2

EU invoicing rules according to the VAT Directive

Sending e-invoices and accepta-Storing e-invoices and access to Issue and content of invoices tion them by the tax administration 1) the taxpayers are free to send 1) the taxpayer independently 1) the taxpayer has the right to issue either a paper VAT invoice or an electronic invoices for an acchooses the format, method and electronic one, provided that the replace (any EU country other than ceptance by a recipient; cipient accepts them; 2) invoices are accepted by tax adthe location of the VAT taxpayer) 2) electronic invoices are mandatory ministrations, provided that the auof storing VAT invoices; for the field of public procurement; thenticity of the origin and the in-2) the authenticity of the origin 3) the taxpayer is obliged to issue a tegrity of their content are guaranand integrity of the content of the VAT invoice when performing most teed by one of two methods – either stored e-invoices, as well as their types of B2B transactions (with by using an advanced electronic legibility, must be guaranteed VAT taxpayers or legal entities signature or by electronic data inthroughout the storage period, as non-VAT taxpayers). An exception terchange (EDI); well as the information they confor B2B transactions are transac-3) in order to guarantee the authentain cannot be changed and must tions exempt from VAT (transacticity and the integrity of e-inremain legible throughout the tions for the provision of public servoices using EDI, member states storage period; vices and activities according to Armay also, in accordance with the 3) the taxpayer may ensure the tax ticle 132 (1) of the VAT Directive rules they established, require the authorities have the access to e-inand transactions for the provision of sending of an additional final docvoices or information they contain financial and insurance services acument on paper; without undue delay when they recording to Article 135 (1) of the 4) Member States may not impose VAT Directive: on taxable persons supplying 4) the tax authorities in the Mem-4) the taxpayer is obliged to issue a goods or services in their territory ber State in which the taxpaver is VAT invoice when carrying out any other obligations or formalities established have the right to acsome B2C transactions, namely relating to the sending or making cess, download and use e-invoices available of e-invoices. within the limits set by the rules of when carrying out a distance sale with taxation in another EU country the Member State in which the or the sale of a new vehicle with detaxpayer is established and in so livery to another EU country. far as those authorities require for the control purposes.

Resource: create by author using [10, 26]

Comparing the norms listed in Table 2 with the norms of Ukrainian legislation in the field of VAT, it should be noted that the Ukrainian practice of issuing e-invoices fully complies with the EU rules and standards, but the procedure for sending e-invoices and especially their acceptance by the tax administration contains a number of discrepancies, namely: 1) e-invoices are accepted only after checking the riskiness of the tax-payer, his tax history (including payment of other taxes), his counterparty and transaction; 2) tax authorities have the right to request the provision of other tax information to confirm the validity of the e-invoice; 3)

the decision to register an e-invoice or not is made as a result of the work of a special commission of tax authority employees (subjective approach), and not based on objective signs or automatic/electronic tools for guaranteeing the validity and integrity of the invoice.

It should be noted that the preamble to the VAT Directive refers to a number of general principles by which national VAT taxation and administration systems should be formed (Fig. 1), namely: the principle of neutrality, the principle of efficiency, the principle of certainty and simplicity, the principle of effectiveness and fairness, and the principle of proportionality.

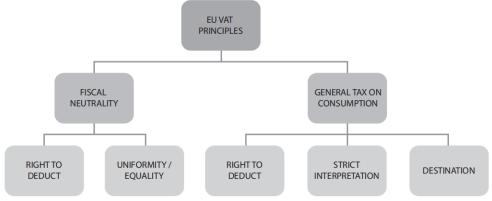


Fig. 1. Typology of EU VAT Principles [11]

The principle of neutrality comes from the very essence of VAT as a tax, namely from the thesis that the tax is paid by the final consumer and should not be paid at the intermediate stages of the path of this product or service to the final consumer, and accordingly Guideline 3 OECD, VAT collection should not affect the competitiveness of the taxpayer (both at the national level and at the level of the EU), distort their economic decisions [19, p. 7], prevents the free movement of goods and services [10].

In almost all court cases on VAT, the CJEU refers to the principle of neutrality, stating that the right to deduct VAT cannot be limited in any way provided that the taxpayer and/or the tax administration comply with all formal requirements for VAT [34]). Therefore, the right to a VAT deduction is a fundamental right of a VAT taxpayer, the violation of which leads to an increase in the costs of a business entity, a cascading effect, and as a result of this increase in the prices of goods or services of such a taxpayer, which in turn will start the process of increasing inflation, distort competition and will affect the economic growth [8, p. 22].

The principle of efficiency is that the costs of the taxpayer and tax administrations for compliance with tax law should be minimized as much as possible [19, p. 4].

The principle of certainty and simplicity provides the establishment of clear, transparent, and simple (understandable) tax rules so that VAT taxpayers have the opportunity to foresee the consequences of tax transaction and a certain mechanism for keeping records of tax transactions with VAT [19].

OECD Guidelines 2017 added to the list of VAT principles *the principle of effectiveness and fairness*, which provides for the establishment of such VAT rules that contribute to reducing the manifestations of VAT

fraud among taxpayers and at the same time correspond to the risks [18, p. 18].

The principle of proportionality is one of the key principles of European law which provides that the measures and instruments used by the EU Member States should not exceed the extent necessary to achieve the set goals. Based on the essence of this principle, there are certain limitations on the approaches used by tax administrations to combat fraudulent VAT schemes, namely they should not exceed (be tougher on taxpayers) the necessary level. Thus, Traversa E. and Ceci E. claim that guided by the principle of proportionality, tax administrations should not use tools to combat fraudulent VAT schemes, which provide a general presumption of fraud or strict liability of the taxpayer without any grounds for this (absence of the fact of using VAT evasion or avoidance scheme) and the possibility for the taxpayer to prove the legality of his actions [34].

Also among the key legal documents that regulate the process of issuing electronic invoices, we should single out Council Directive 2001/115/EC of 20 December 2001 amending Directive 77/388/EEC. The main view of the document is to simplify, modernize and harmonize the conditions laid down for invoicing in respect of VAT; businesses operating in EU Member States should have simplified invoicing regulations and procedures harmonized at the EU level [17, p. 340]. Also in 2014, the European Parliament approved Directive 2014/55/EU on electronic invoicing in public procurement [12]. It also takes steps to ensure the principles of equal treatment and technological neutrality run through e-invoicing [31], as well as ensuring general legal requirements and technical standards for business processes and interoperability at three levels: regarding invoice content (semantics), data format (syntax) and method of transfer [12].

As for the e-invoices, e-invoicing is one of the areas where the EU Member States are aiming to achieve harmonisation, standardization of the mechanism and format of issuing them in order to ensure the possibility of using the system in any Member State. The ultimate goal is to simplify the implementation of cross-border sales operations. Thus, in order to improve the operation of the VAT administration system for business and strengthen the fight against VAT fraud, on December 8, 2022, the European Commission (EC) published the proposal on the EU VAT in the Digital Age (ViDA) reforms that includes three components with the timeline for 2023-2028 [2]. The main goal of this reform is to

harmonize Digital Reporting Requirements (DRR) and Continuous Transaction Controls (CTC) by EU states [5]. Other component is a transition of all EU Member States (from 2028) to electronic VAT reporting (e-reporting) in near-real-time format (within two working days after the event) based on electronic invoices (Fig. 2), which provides operation of a unified VAT invoices registration system across the EU [13]. The need for digitalization of the VAT administration system in the EU also arose due to the active growth rates of sales volumes of goods through various online platforms (especially such as platforms for short-term rental of housing or vehicles, etc.).



Fig. 2. EU requirements for VAT e-reporting that should be implemented by all Member States by 2028 [2]

However, the range of issues that still need to be decided include the following: 1) which periodicity (periodic (PTC) or continuous (CTC) type of transactions control to apply; 2) which reporting period is more suitable (quarterly or monthly for PTC, weekly or daily for CTC); 3) in what way to preserve the confidentiality of VAT taxpayer data, provided that a common system is used for all EU Member States; 4) what options should be provided for pre-filling VAT reporting; 5) what benefits from the use of the e-invoicing system must be provided for VAT taxpayers [16]; 6) what should include the definition of "substantial" and "formal" e-invoices data control.

3.2.2. The best e-invoicing practice of the EU Member States.

A number of EU countries have already implemented a system of electronic invoices. So **Italy** was one of the first European countries to introduce VAT e-Invoicing for B2G transactions in 2014. In March 2015, Italy introduced the official document exchange platform *Sistema di Interscambio (SDI)* and obligated all companies operating in Italy to generate electronic invoices by FatturaPA (XML) or other formats allowed by the European standard on electronic invoicing (EN 16931 [10]) and send them through SDI [35]. For now this system applies to invoicing for B2G, B2B and B2C (from January 2019) transactions, as well as transactions by "simplified scheme" and cross-border invoicing

ing (from January 2022). Micro-enterprises with revenues or fees of up to EUR 25,000 will be included in the e-invoicing scope of the application from January 2024. At the same time, due to the architecture FatturaPA XML can contain one or several (group) documents. Italy's electronic VAT administration system allows Italian tax administrations to verify tax transactions in real time.

During the process of registration of electronic invoices, their preventive verification is carried out according to formal (technical) features, namely: 1) authenticity of the origin of the invoice; 2) integrity of content (ensured by electronic signature); 3) standard format (readability of the file); 4) storage (access to the archive and information where the archive is stored) [6]. It should be noted that these are general rules for the validation of e-invoices in all the EU Member States provided for by Directive 2014/55/EU [10]. A more detailed analysis of the tax information contained in the invoices is carried out during the tax audit, for that in Italy, for example, VAT taxpayers are mandated to preserve the electronic invoices for at least 10 years. Cancellation of electronic invoice registration is provided only if the buyer rejects it. As a preventive measure regarding the operation of VAT fraud schemes, fines are applied: 1) 90-180% of the relevant VAT amount – for not issuing an electronic invoice or for issuing an invoice that does not comply with the XML format; 2) 100% of the relevant VAT amount – for issuing an invoice to the client that does not comply with the requirements of the Mandate [15]; 3) from 2 to 400 Euros – for each non-compliant cross-border invoice.

In other EU Member States, the introduction of einvoicing in **France** started with business-to-government (B2G) transactions for which the national invoicing portal *Chorus Pro* was implemented. In September 2021, France approved the Mandate [9], the norms of which provide for the following deadlines for the introduction of mandatory electronic invoicing and reporting for all B2B and B2C format transactions, depending on the size of the company (Table 3). But from July 2024 all companies (private and public) must be able to accept electronic invoices [21]. Thus, the scope of e-invoicing in France includes transactions B2B, B2C, Exports and imports transactions, Payment status of VAT invoices, Imports of services, Exports excluded.

Table 3

Terms of introduction of mandatory e-Invoicing and e-Reporting in France [21]

Companies	Terms
Large companies	as from 1 July 2024
Mid-sized companies (MSC) *	as from 1 January 2025
Small and medium enterprises (SME) **	as from 1 January 2026

^{*} MSCs – companies which are not SMEs and have fewer than 5,000 employees and an annual turnover not exceeding EUR 1,500 million or a balance sheet total not exceeding EUR 2,000 million.

In order to extend the e-invoicing system to the private sector, France introduced a Mexican model, involving the certified intermediaries whose role is to create, verify and send electronic invoices to Chorus Pro [3]. So taxpayers will be able to send e-invoices directly through the public invoicing portal (*le portail public de facturation, PPF*) from the Chorus Pro public platform, or through "dematerialization platforms" (*Plateformes de dématérialisation parteniers, PDP*), which are approved agents, or through dematerialization operators (OD). It is also provided that taxpayers will be able to mix these different e-invoicing options by choosing the PDP/OD/PPF depending on the invoice format.

One of the key objectives of implementing total einvoicing is to combat VAT fraud by providing Continuous Transaction Control (CTC). CTC is a continuous computerized tax audit based on the processing of a critical mass of invoices, data and statuses in real time. Thus, in contrast to the Italian model, the validation of electronic invoices is not fully centralized, but is carried out either by the PPF if the taxpayer sends the invoice directly through the public invoicing portal, or by dematerialization platforms (PDP), which clean electronic invoices. That is, such PDP have the role of guarantor of the authenticity, reliability, compliance and integrity of the electronic invoice for the tax administrations. Also, as a preventive measure, the French government also imposes penalties of EUR 15 for each e-invoice not issued, but not exceeding EUR 15,000 per year for taxpayers and EUR 45,000 per year for certified PDP agents [3].

In **Spain**, since 2015, all VAT payers carrying out B2G transactions and the amount of these transactions exceeds EUR 5,000 are obliged to send electronic invoices to counterparties using Facturae XML and the national platform for the exchange of electronic invoices FACe (Punto General de Entrada de Facturas Electrónicas, PGEFe) [30]. All other transactions (e.g. non-B2G transactions or transactions under EUR 5,000) can also be sent using the platform, but this is not mandatory. At the same time, in July 2017, Spain introduced the mode of transmission of invoices to tax authorities in real time by SII. But it should be noted

that the development of e-invoicing in Spain is taking place by analogy with the Italian Mandate [15] and the French Mandate [9] and under the Law "Creation and Growth of Companies" adopted at the end of 2021, electronic invoicing will be mandatory for transactions B2B in the domestic market, namely: from 2024 – for companies and self-employed persons with an annual turnover of more than EUR 8 million; from 2026 – all other companies and freelancers. This decision was driven by aspirations aimed at increasing the efficiency of business operations and combating VAT fraud.

In order to carry out tax audits, the Spanish Tax Administration (AEAT) has access to or requests information from any participant of the VAT transaction, including the software developer [7]. Also, e-invoicing systems must meet the following requirements: 1) data protection (blocking any changes to information contained in invoices after they are issued); 2) access of the AEAT to the database in real time, which allows tracking and extraction of data registered in the system; 3) availability of an event register, which performs automatic registration of all events in the information system, which can be transferred electronically to the AEAT upon request; 4) automatic and instant reporting of all invoice registers for the AEAT [14; 22]. Invoices must contain an alphanumeric identification code, QR code, and a narrative "VERI*FACTU", which certifies that the invoice was generated using a certified (meets the technical and functional requirements provided by the AEAT) computer system and is a confirmation of the authenticity of its origin and integrity [22]. It is also mandatory to keep electronic invoices for at least 6 years. As in the practice of Italy, in the Spanish e-invoicing system cancellation of the registration of an electronic invoice is provided for only if it is rejected by the buyer.

In **Poland**, taxpayers will be obliged to issue electronic B2B invoices from July 1, 2024, and VAT-exempt taxpayers from January 1, 2025. At the same time, B2C transactions remain exempt. For e-invoicing, the e-mikrofirma program is used, which provides reporting and issuing of invoices to the national system of electronic invoices in Poland (*Krajowy System e*-

^{**} SMEs – companies with fewer than 250 employees and an annual turnover not exceeding EUR 50 million or a balance sheet total not exceeding EUR 43 million.

Fakturr, KSeF). All invoices are pre-verified by KSeF, after which they are assigned a unique identification number. Basic verification is supported by a centralized invoice clearing database – Continuous Transaction Controls (CTC). Further verification of the information contained in the invoices is carried out in the format of a tax audit, for which the Polish version of the OECD standard tax file (SAF-T) is used instead of the VAT tax return from October 1, 2020 [1]. As in the practice of other EU countries, an electronic invoice can be unregistered only if the client does not accept it.

It should be noted that to encourage the implementation of KSeF by taxpayers, the Polish authorities introduced a system of benefits: 1) accelerated VAT refund or credit for 40 days instead of 60 if the amount does not exceed PLN 3,000; 2) no requirement for confirmation of credit notes from company's clients; 3) no requirement to comply with the rules for archiving invoices in Poland [4]. Also, from July to December 2024, there will be a moratorium on imposing penalties for e-invoicing in Poland. Thus, in response to ensuring disclosure from taxpayers, the Polish authorities provide such taxpayers with bonuses, which contributes to building partnerships between taxpayers and tax administrations.

Although **Switzerland** is not a member of the EU, but it is associated with the EU through a number of bilateral agreements and accordingly, in the matter of VAT administration, it is governed by the same rules as the EU Member States. Consequently, Switzerland has been using an e-invoice system for more than 20 years, but different e-invoice standards have been used for B2G, B2B and B2C transactions. Since 2020, Switzerland has introduced a hybrid file format and trans-

formed the e-invoicing and e-reporting system by analogy with the French one. To verify electronic invoices and confirm their integrity and authenticity, the Swiss Federal Tax Administration (SFTA) applied the safe harbour rule, which provides that for any signs of risk, the taxpayer has the opportunity to confirm the authenticity of e-invoices. For this, the taxpayer has the opportunity to provide the SFTA with any other documents related to all processes from the purchase to the payment of the goods/service "...such as underlying contracts, order sheets, bills of delivery, booking records, payments and so on" [32]. But then, according to the principle of free consideration of evidence (contained in article 81 (3) of the Swiss VAT Law), the SFTA switched to the internal control system on procure-to-pay, which provides for the taxpayer to use the "...constant and reliable audit system a trail between procurement process, e-invoice and payment" [32], which on a permanent basis ensures the reliability and integrity of the information contained in electronic invoices. If the "safe harbour" principle is related to the one used by the Ukrainian tax administration, then the internal control system on procure-to-pay is an approach that can become a guideline for improving the Ukrainian e-invoicing system.

As a result of the generalization of the European practice of e-invoicing and its comparison with the Ukrainian practice of VAT administration using the Unified Register (Table 4), the key features of both systems, as well as the advantages and "weaknesses" of the Ukrainian practice were identified, which made it possible to formulate promising directions for improving the Ukrainian system with the aim of levelling existing shortcomings or "distortions" and bringing it closer to European practice.

Table 4 Comparative analysis of the parameters of the functioning of the Automatic VAT administration system in Ukraine and the e-Invoicing in the EU

Characteristics Automatic VAT administration system in e-Invoicing in the EU		
	Ukraine	e-Invoicing in the EU
1. Issue of electronic invoices	Obligation to form an electronic VAT invoice	The payer chooses a paper or electronic form of VAT invoice
2. The range of VAT taxpayers who are required to issue electronic VAT invoices	All VAT taxpayers – legal entities and entrepreneurs	It depends on the requirements of the national legislation of a particular Member State, but mostly these are large companies
3. The range of transactions for which an electronic tax invoice is issued	All types of VAT taxpayer transactions	All VAT transactions (B2B, B2B cross-border, B2G, B2C), some exempted transactions and some non-taxed transactions
4. Registration of an electronic VAT invoice	Mandatory registration of an electronic VAT invoice	Mandatory use of e-invoices and their registration is determined by the law of Member States
5. Application of special VAT accounts	Used as a guarantee of the solvency of the VAT tax- payer in terms of paying tax obligations for the re- porting month	Not applicable. The justification is that the separation of the taxpayer's capital into a separate account con- trolled by the state will contradict the principles of freedom of entrepre- neurial activity
6. Verification of VAT invoices	The information entered in the electronic VAT invoices is used to analyze the riskiness of the VAT taxpayer, his counterparties and the riskiness of transactions, on the basis of which a decision is made to stop or refuse to register the invoice (equal to refusal in recognition of the validity of the transaction)	E-invoices are verified for authenticity and completeness
7. The right for deduction	The tax administration has the right to stop or refuse the registration of a VAT invoice, which means de- laying or depriving the buyer of the right to a VAT deduction	The right to VAT deductions is a key right of a VAT taxpayer, which is embedded in the essence of the principle of neutrality of VAT taxation
8. Use of the database, risk management	The Unified Register is one of the key information sources for tax risk management. On the basis of available information, the operating system of tax administrations can visualize supply schemes involving risky taxpayers. The results of such an investigation are the basis for forming a schedule of tax audits.	In some Member States the information from the database is used to generate preliminary VAT reporting and to conduct tax audits, identify fraudulent VAT schemes and combat VAT evasion or avoidance.

Even such comparative analysis of electronic VAT administration models in Ukraine and in the EU allows us to conclude that the Ukrainian system is burdensome both for the tax administration and especially for taxpayers. As we can see from the data in Table 2, the biggest difference in the practice of e-invoicing in Ukraine and the EU is in the process of verifying VAT invoices and ensuring the taxpayer's right to a VAT deduction. If in European practice the right of a VAT taxpayer to VAT deduction is inviolable, then in Ukrainian practice such a right of a taxpayer (through the mechanism of suspension / refusal to register a VAT invoice) is used as a tool to combat VAT fraud (with schemes of minimization or non-payment of VAT), which violates the fundamental principles of VAT taxation.

It should be noted that among EU Member States there is a practice of applying repressive measures to

limit the economic consequences of VAT fraud, which is regulated by Article 273 of the VAT Directive [34]. Thus, the most common repressive tool for combating VAT fraud among the EU countries is the application of the principle of solidarity responsibility with third parties who knew about the fact of VAT evasion or avoidance (Article 205, VAT Directive) [34]. But in view of the Ukrainian practice, the effectiveness of the application of the mentioned principle is not considered promising, if this third party is the VAT taxpayer and is the main beneficiary of the VAT fraud and is the initiator of such a scheme (the scheme of forming a fictitious VAT deductions is a common scheme of fraud in Ukraine). The EU countries also use denial of the right to deduction, denial of tax exemption, or denial of VAT refund as methods of combating VAT evasion schemes. But these methods are based on the results of applying risk-oriented tools or conducting the tax inspection, that is, the VAT taxpayer remains the specified type of right only if there is evidence of his violation of tax rules. At the same time, as a justification for their decision, tax administrations are guided by the criteria of compliance of the transaction participant, his potential and resources to the parameters of a specific transaction, while in Ukrainian practice, the verification of VAT invoices is based on a set of calculated indicators which characterized the average trend in the activity of the participant(s) and includes the payment of not only VAT, but also other taxes and fees, which cannot be considered an objective assessment. In this regard, the Court of Justice of the European Union (CJEU) insists that tax administrations must have clear and objective evidence that a specific VAT transaction has a connection with the implementation of a VAT evasion or avoidance scheme and the VAT taxpayers, who are parties to this transaction, knowingly take part in this kind of transactions.

Another aspect of the application of tools to combat VAT fraud in the Ukrainian practice of electronic VAT administration is the inclusion of a VAT taxpayer in the list of risky taxpayers, if his counterparty is recognized as risky. In the context of this issue, the CJEU ruled that the tax administration should not require the VAT taxpayer to use methods of verification of its counterparties (conducting a detailed check of its activities), which can only be carried out by the tax administration and applied during the tax audit, in order to prove his right to VAT deduction [34]. Thus, in our opinion, it is unfair to use repressive methods against the taxpayer for the illegal actions of his counterparty. The VAT taxpayer does not have the opportunity and the right to control the actions of other business entities, and therefore he cannot predict the moment of fulfilment of the conditions for applying sanctions against him and manage the factors that ensure the appearance of these conditions (principle of certainty and simplicity). Also, such a repressive method leads to the application of the presumption of fraud, which violates the principle of proportionality and cannot contribute to building partnerships between taxpayers and tax administrations.

Thus, summarizing the above, it can be stated that the Ukrainian system works according to the principle that the taxpayer may lose the right to VAT deduction at any time, in particular, when the taxpayer's participation in VAT evasion or avoidance schemes is not detected and proven. According to the author, the reason for the transformation of electronic VAT administration and risk-based tax control into a discriminatory mechanism against taxpayers in Ukraine is five aspects of the work of the Ukrainian electronic VAT administration system:

- 1) the moment of application of the repressive method in the form of refusal to VAT deduction the moment of registration of the VAT invoice, i.e. the moment of fulfilment of the duty of the VAT taxpayer;
- 2) mismatch between the subject whose level of risk is assessed for the purpose of making a decision on the registration of the VAT invoice and the subject who is the carrier of the repressive measure the decision to

suspend or refuse the registration of the VAT invoice is taken by the tax authority based on the analysis of data on the VAT taxpayer (seller), but as a result, the VAT taxpayer (buyer) loses the right to VAT deduction;

- 3) the content of the indicators that are used to determine the riskiness of the VAT taxpayer and transactions some of them are of a general and abstract nature, others relate to the payment of other taxes (in this case, we consider it incorrect to deprive the VAT taxpayer of the right to VAT deduction for violating the payment rules other taxes than VAT). The indicators do not meet the goals of risk management and accordingly do not allow fulfilling the tasks assigned to them;
- 4) involvement of a large number of participants in the decision-making process regarding the status of VAT invoice registration tax administrations create commissions to evaluate additional information provided by the taxpayer to confirm their risklessness and/or credibility of the tax transaction, as well as taxpayers are forced to engage tax lawyers or go to court for to defend their right to a VAT deduction or the right to fulfil the taxpayer's duty (however paradoxically). This increases the cost of VAT administration both on the part of tax authorities and on the part of VAT taxpayers, thereby reducing the economic efficiency and feasibility of such control measures;
- 5) the use of special accounts and the conditional balance on this account as a restrictive mechanism for the fulfilment by VAT taxpayers (sellers) of their duty to register a VAT invoice and the use by the VAT taxpayer (buyer) of the legal right to VAT deduction.

The presence of the above-mentioned aspects in the work of the electronic VAT administration system in Ukraine not only does not allow to simplify and speed up the VAT administration process both from the side of the tax administration and from the side of VAT taxpayers, but also creates additional, "artificial" barriers for taxpayers to fulfil their obligations regarding the payment of VAT and conducting business. Considering the fact that precisely these aspects contradict the principles that guide the EU in VAT taxation, the need for their presence in Ukrainian electronic VAT administration system raises doubts.

3.3. Proposals for improving the Ukrainian VAT electronic administration system based on European practice

According to the reports of the Ministry of Finance of Ukraine on the implementation of indicators of the budget of Ukraine, VAT is the largest source for filling the budget of Ukraine, and the efficiency of VAT administration is a key issue in ensuring the financial stability (minimization of fiscal risks) of the country's budget. The electronic system of VAT administration is a key supporting element of the VAT mechanism of taxation, accordingly, the effectiveness of VAT taxation as a whole depends on the efficiency of this system. But the presence of a large number of contradictory points in the functioning of this system does not contribute to the achievement of the main goals of VAT administration, and does not provide an opportunity to effectively combat VAT fraud. Therefore, as a response to the identified and systematized shortcomings in the functioning of the Ukrainian system of electronic VAT

administration, we have formulated the following proposals for improving the electronic system of VAT administration in Ukraine, which are listed below.

1. The moment of application of the repressive method. Given that at the time of making a decision on registration, suspension of registration or refusal to register a VAT invoice, the tax administration does not have sufficient information and evidence of illegal actions of the VAT taxpayer, we believe that the use of tools to "punish" taxpayers is unethical, incorrect and unfounded. Prior to this, if we are talking about the implementation of the principle of compliance of the measure of punishment with the level of guilt of the taxpayer (principle of proportionality), when the measure is determined in accordance with the violation committed by the taxpayer and does not significantly exceed it, then the application of a single format of punishment in the form of blocking the registration of the VAT invoice is disproportionately, which has a discriminatory nature in relation to honest taxpayers. Therefore, in order to preserve the risk-oriented nature of the electronic VAT administration system and foresee the application within its limits of tools to combat VAT fraud, it is necessary to expand the areas of application of the VAT database and improve the analytical tools used by tax administrations to process information from the VAT database. The mechanism of blocking the registration of tax invoices based on the existing approach should be cancelled or the point of application of this repressive method should be shifted to the moment when the tax administration has evidence of the use of minimization or evasion schemes by the taxpayer. This opinion is supported by the position of the CJEU, according to which "...the right to deduct VAT is fundamental and this right could not be denied in the presence of simple undemonstrated suspicions from the tax administration" [34]. That is, the moment of application of repressive methods must coincide in time either with the moment of committing an offense (to function as a preventive tool), or with the moment of proving the fact that the taxpayer is a participant in the VAT fraud scheme. Under such conditions, the system of electronic VAT administration will be more objective, fair and transparent, and will also be understandable and acceptable to taxpayers, which will be able to contribute to reducing the level of corruption in this system, thereby ensuring an increase in the level of taxpayers' trust in tax authorities administrations and mutual compliance.

2. Application of repressive methods to some VAT taxpayers based on assessment of the riskiness of others. It is also important to ensure the compliance of the VAT taxpayer, whose activity is verified with tax information, and the VAT taxpayer, whose activity is directly affected by the VAT invoice blocking mechanism. Although the use of control methods through third parties is widespread in the tax control, in this case it is not control, but the formation of grounds for the use of repressive methods. In order to restore the balance and logical connection in the format "committing an illegal act – receiving a punishment", we again appeal to the application of refusal to register a VAT invoice only when the tax administration has clear reasons to believe that the VAT taxpayer is a conscious

participant of VAT avoidance or evasion schemes. As for the information base for the formation of the evidence base, the end-to-end, cross verification should be used here, but this should take place within the scope of the tax audit (so that the audit could reveal the concrete fact of the use of a fraudulent scheme) in real time or in the format of an inspection, and not be applied during the fulfilment by the VAT taxpayer of his duties regarding the registration of the VAT invoice as a key condition of this registration.

3. Content of risk management indicators. At the same time, an important aspect is the review of the list of indicators used by the tax administration to assess the level of riskiness of the VAT taxpayer and the transactions he carries out or participates in. Such a review should be aimed at excluding indicators that characterize the payment of taxes other than VAT, and indicators that, according to the method of their calculation, are generally informative, but the taxpayer has a high probability of falling into the "risk" zone for this indicator, even under the condition of normal conducting activities. The list of indicators used to assess the riskiness of the VAT taxpayer or transactions should be more detailed and extensive, contain indicators that allow for a comprehensive assessment of the VAT taxpayer's activities, and be applied within the scope of tax control (audit).

4. Significant influence of the human factor on decision-making. Another aspect, which is directly related to the previous one, is the active and widespread use of modern technologies and the minimization of the human factor in the process of functioning of the electronic VAT administration system. This means that the VAT administration mechanism should not provide for the presence of "blind" (shadow) zones and areas, when verification of the taxpayer or transactions is carried out by tax administration officers who may have a hidden interest. Accordingly, the work of the commission which makes a decision on the registration of a VAT invoice, both at the local and central level of work of the tax administration, must be refuted. The process of making a decision based on the results of the verification of the VAT invoice (transaction) and the taxpayer can be built by analogy with the experience of risk management in the customs authorities of Ukraine, where the automated system determines the list of procedures that must be carried out in order to confirm the existence of a violation of the rules, and the customs officer based on the results of the measures taken enters into the system the information about the decision taken with a mandatory justification or notes a reasoned explanation about the impossibility of carrying out this or that control measure (this information with the designation of the customs officer is stored in the database of the customs). This approach, on the one hand, will increase the level of responsibility of tax administration officers for the decisions made, which will contribute to the minimization of the subjective/corruption component in the VAT administration system in Ukraine, and on the other hand, will lead to a decrease in the number of court cases regarding unjustified blocking of VAT invoice registration. All in all, this will contribute to reducing the cost of the VAT administration process both on the part of tax authorities and on the part of VAT taxpayers, which fully corresponds to the principle of efficiency.

5. Application of special VAT accounts. It is also necessary to abandon the use of "artificial" indicators as criteria/conditions for registration of a VAT invoice, such as a conditional balance on a special VAT account. First of all, the state's withdrawal of its working capital from the taxpayer (the taxpayer loses certain economic opportunities), the state's use of these funds as an alternative source of financing its needs on interest-free terms, and at the same time the use of this account is not in the interests of the VAT taxpayer, is a distortion of economic and logical principles. Secondly, again the financial situation or the current state of payments of one VAT taxpayer (seller) should not determine the possibility of using his right to a VAT deduction for another VAT taxpayer (buyer). And as it was repeatedly stated above, any additional limitation of the VAT taxpayer's right to deduction is a gross violation of the principles of VAT taxation.

Thus, the use in the practice of VAT administration of a system that creates an artificial distribution of VAT taxpayers relative to their ability to fulfil their legal obligation to register a VAT invoice increases competition between taxpayers regarding the issue of proving to the tax administration their risklessness, and as well excludes part of their funds from circulation, thereby reducing the financial mobility of the taxpayer, cannot allow the state to expect a positive attitude towards such a system from the taxpayers and to contribute to increasing the conscientiousness of tax payment (that the decision-making by the taxpayer is influenced not only by the tax rate, but also by the way this tax is collected, i.e. the system tax administration). In such a situation, tax administrations have two ways to ensure compliance with tax rules - either increase coercive pressure on taxpayers by increasing the scope of the use of "punitive" tools, or liberalize the tax administration system, making it more convenient and understandable (in particular, decision-making algorithms) for taxpayers, such that does not violate the key rights and obligations of taxpayers. We share the opinion of Shwabii K. [29] that, especially given the need to restore the country's economy after the end of military operations on the territory of Ukraine, it is important to implement the second scenario, aimed at creating partnership relations between the state and business and forming a favourable investment climate in country.

4. Conclusions. Considering the fact that the electronic VAT administration system in Ukraine forms a large database of all transactions of a large number of taxpayers, which provides tax administrations with the opportunity to carry out tax control based on a risk management system, the need for the functioning of this system does not require additional evidence. But there is a question of improving the operation of this system from the point of view of forming a more transparent and fair system based on the balance of taxpayers and tax administrations interests, as well as from the point of view of bringing national practice closer to the standards, principles and methods of VAT administration of the European Union.

Thus, the mechanism for blocking the registration of VAT invoices in the system of electronic VAT administration in Ukraine is a tool based on the risk management system, the purpose of which is to deter or prevent the use by VAT taxpayers of various schemes that lead to the avoidance or evasion of VAT payment, to the manipulation of budget compensation, "scrolls", preventing the operation of conversion centres that create a fictitious right to VAT deduction, etc. But at the same time, the operation of the specified mechanism, as it was said earlier, violates the rights of taxpayers. Accordingly, the expediency of having this mechanism in the "European version" of the electronic VAT administration system in Ukraine should be questioned. And instead of that to find a new mechanism for punishing VAT taxpayers for violating tax legislation, the effect of which will be more objective and fair, and which not to create additional obstacles for the VAT taxpayers activity.

Taking into account the fact that the Ukrainian practice of combating various types of fraudulent schemes, and in particular VAT evasion schemes, proves the importance and necessity of using "built-in" tools to counter the illegal behaviour of VAT taxpayers, which are effective at the time of the transaction (as a preventive method) and make it impossible to carry out (registration) illegal or risky transactions. But such tools should be objective and transparent, not disrupt the normal process of doing business and not divert the attention of business owners from business development to proving the validity of their transactions to the tax administration. And despite the fact that European legislation does not restrict Member States from using various preventive measures or tools to combat VAT fraud, Ukraine should still refrain from using tools that are too "repressive" in relation to taxpayers. Moreover, the CJEU declares that the administrative measures of Member States should not exceed the limit necessary to achieve the goal of VAT administration (i.e. the combat against VAT fraud) and should not harm the activities of VAT taxpayers [34].

The improvement of the Ukrainian system of electronic VAT administration should involve the complete rejection of the use of tools that violate the rights of taxpayers or create obstacles to their business, and the wider use of such technologies as blockchain and artificial intelligence for the verification of VAT taxpayers and transactions regarding their degree of risk. The features and prospects of using modern technologies in the system of electronic VAT administration are considered by the author as a topic for further research work.

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MEDICAL SCIENCES

FEATURES OF CEMENT FIXATION OF REMOVABLE DENTURES ON IMPLANTS

Babayev E.,

Doctor of Philosophy in Medicine, assistant Azerbaijan Medical University, Department of Orthopedic Dentistry, Ваки, Azerbaijan

İsmaylov D.,

Doctor of Philosophy in Medicine, assistant
Department of Terapeutic Dentistry
Azerbaijan Medical University
Baku, Azerbaijan

Huseynova R.

Department of Therapeutic c Dentistry Assistent Azerbaijan Medical University Baku, Azerbaijan https://doi.org/10.5281/zenodo.7878339

Abstract

The article describes the features of cement fixation in prosthetics with fixed orthopedic structures on implants. The groups of cements used in prosthetics on implants are described.

Keywords: prosthetics on implants, cement fixation, types of cements, screw fixation.

In prosthetics on implants, two main methods of fixing orthopedic structures are used - cement and screw. One of the most relevant topics for discussion is the advantage of one or another variant of the connection between the prosthetic structure and implants [1]. The effectiveness of screw fixation over a long period of observation in patients with complete edentulism has been described in the literature for a long time. Recently, new protocols for prosthetics on implants have appeared. In particular, this applies to protocols for early functional loading, where there is a need for simple and reliable fixation on cement, which (compared to screw fixation) is much less covered in scientific research and publications today [2]. Screw fixation provides a rigid orthopedic connection designs with implant abutment. Cement-retained bypasses some of the limitations of screw-retained. These include: cosmetic imperfections, low occlusal stability, difficulty in fabricating passively fitting restorations. It is believed that the cement layer absorbs excessive occlusal load and optimizes its distribution to the implant and bone. With this in mind, cementation is often the choice for implant prosthetics. Advantages of cement fixation:

- 1) there is no gap between the abutment and the prosthesis;
- 2) technically simpler and more economical to manufacture:
- 3) aesthetic or functional problems are easier to fix with cementing.

Disadvantages of cementing:

- 1) loss of access to the screw when it is loosened;
- 2) limited access to peri-implant tissues;
- 3) problems with the replacement of the structure due to changes in clinical conditions [3];
- 4) potential risk of irritation of nearby soft tissues with cement residues.

Orthopedic constructions with cement fixation on implants differ little from traditional dentures by manufacturing technique. That is why the manufacture of prostheses for cement fixation on implants can be considered a common routine work that does not require special training from a dental technician. When the implant axes diverge by more than 17°, it is easier to make a restoration on them with cement fixation, because there are no angled abutments for screw fixation with a screw lead divergence of more than 17° in any system [4]. In addition, when cemented, it is easier to achieve a perfect passive fit due to the 25-30 µm space for cement [5]. When prosthetics on implants in the region of lower premolars and molars, screw holes are extremely unaesthetic due to the impossibility of completely masking them. The shearing of veneering ceramics can jeopardize the controlled distribution of dynamic loads in general [6, 7]. Therefore, preference should be given to cemented suprastructures, where ideal occlusal contacts can be created that remain stable for a long time. When choosing the design and method of fixation of the prosthesis, it is necessary to pay attention to the possibility of removing the restoration.

The need to remove the restoration arises when:

- 1) periodic replacement of orthopedic parts;
- 2) loosening or fracture of the screw;
- 3) abutment fracture:
- 4) modification of the prosthesis after the loss of the implant;
 - 5) repeated surgical operation.

The possibility of removing the restoration significantly increases the safety of treatment and is most often absolutely necessary for assessing the condition of implants and adjacent tissues, as well as for professional oral care. After all, it is much more convenient

to study the depth of periodontal pockets, complex sanitation and hygienic manipulations in the absence of a prosthesis. On the other hand, the inability to easily remove the restoration using traditional cements for permanent fixation is the main disadvantage of cement fixation. plaque in the gingival sulcus. Cement residues contribute to the adhesion of microorganisms to the implantation surface, causing peri-implantitis with all its signs: edema, pain, deepening of periodontal pockets, bleeding (or exudate) during probing, radiographic signs of bone loss around the implant [8, 9]. That is why temporary cements are so often used to cement restorations on implants to allow for easy removal of the restoration when needed. Many authors consider it expedient to use temporary cements to fix the prosthesis on several implants [10, 13, 14]. According to the international classification, cements are divided into 8 types: zinc phosphate, silicate, silicophosphate, bactericidal, zinc eugenol, polycarboxylate, glass ionomer, polymer. In orthopedic dentistry, cements are divided into:

- according to the period of fixation into temporary and permanent ones [11];
- by chemical composition for zinc-phosphate, polycarboxylate, glass ionomer, polymer modified cements (glass ionomer cements reinforced with polymers), composite [12].

Of the temporary cements for prosthetics on implants, eugenol-free zinc oxide cements are used. Zinc phosphate cements consist of a liquid - an aqueous solution of phosphoric acid and a powder, the main components of which are oxides of zinc, magnesium, aluminum, silicon, and iron. Disadvantages of zinc phosphate cements: low adhesion to hard tissues of the tooth and metal, shrinkage, low moisture resistance.

Polycarboxylate cements appeared in the 70s of the past

century. Thanks to the polycarboxylate groups of polyacrylic acid

form a chemical bond with the hard tissues of the tooth, are more stable

humid environment. Firm "Ultradent" (USA) produces

eugenol-free polycarboxylate cement "UltraTemp" of two types.

The regular type is intended for temporary fixation of crowns and

bridges for a period of 2-4 weeks. Solid type - for long-term fixation of restorations and prostheses on implants

Modern traditional and modified glass ionomer cements are also used to fix prostheses on implants. GICs for fixation have a number of advantages: biocompatibility, good adhesion to metal and tooth tissues, thin fixing film, low solubility, fluoride release and ease of use. Compomers are also glass ionomers supplemented with resins, but the polyacrylic acid groups in them are formed due to the polymerization of crosslinks of the acid-functional dimethacrylate monomer. Modified GICs also have higher adhesion and strength, withstand significant occlusal loads, with almost zero solubility in aqueous media.

When prosthetics on implants, they are used when there is poor anatomical retention (low implant head after preparation), as well as for fixing long bridges.

The advantages of composite fixing cements are as follows: high adhesion, strength, resistance to moisture, high aesthetics. For the hardening method, different types of materials of this group are produced: chemical, light, as well as self-adhesive universal composite cements of the double hardening method.

In recent years, new cements based on polymer rubbers have appeared on the market of modern dental materials, which optimally combine strong fixation with easy removal of the prosthesis if necessary and are designed specifically for fixing fixed orthopedic structures on implants. The main components of the material: multifunctional methacrylates, urethane dimethacrylate, polymerization activator. The main requirements that cements of this group must meet are: high retention (long-term fixation), ease of removal of the prosthesis (easily removed if necessary), low solubility, do not affect nearby tissues, have shock-absorbing qualities, have no taste and smell, be comfortable in use, easy to clean (remains are easily removed from the restoration). To facilitate the removal of the structure, if necessary, manufacturers

It is recommended that a thin layer of R-Y Jelly or other water-based lubricant such as Vaseline be applied to the surface of the abutment.

An analysis of the literature data indicates that there is not enough information about this type of material. The purpose of our research is a thorough study of the properties of cements of this group.

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ENDOMETRIAL HYPERPLASTIC PROCESSES, POLYPS AND CANCER: A STUDY OF THE RELATIONSHIP AND CONSEQUENCES

Farhan Tarek,

Doctor of Medical Sciences, obstetrician-gynecologist Head of the gynecological department of the medical clinic Russia, Moscow

Nwilati Alaa Eddin,

Vascular and endovascular surgeon Rashid hospital, Arab Emirates, Dubai

Al-Farhan Anas,

Doctor surgeon

Murjan medical complex, Saudi Arabia, Dhahran

Albert Roger

Head of the Department of Oncology and Palliative Care, oncologist, radiotherapy specialist and holder of the DESC certificate in Oncology – drug treatment of cancer France, Sallanches

ГИПЕРПЛАСТИЧЕСКИЕ ПРОЦЕССЫ ЭНДОМЕТРИЯ, ПОЛИПЫ И РАК: ИССЛЕДОВАНИЕ ВЗАИМОСВЯЗИ И ПОСЛЕДСТВИЙ

Фархан Тарек

Доктор медицинских наук, врач акушер-гинеколог Заведующий гинекологическим отделением медицинской клиники

Россия, Москва

Нвилати Алаа Эддин *Сосудистый и эндоваскулярный хирург Госпиталь Рашида, Арабские Эмираты, Дубаи*

Аль-Фархан Анас

Врач хирург

Медицинский комплекс Мурджан, Саудовская Аравия, Захран

Альберт Роджер

Заведующий отделением онкологии и паллиативной помощи, врач онколог, специалист лучевой терапии и обладатель сертификата DESC в онкологии – медикаментозное лечение раковых заболеваний Франция, Салланчес

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Abstract

This article examines the relationship between endometrial hyperplastic processes and cancer, as well as current approaches to diagnosis and treatment, taking into account international practice and statistics. Endometrial hyperplasia is one of the risk factors for endometrial cancer, especially in the presence of atypia. Ultrasound examination, hysteroscopy and histological examination of biopsy material are used to identify and determine the degree of hyperplasia and atypia. Treatment can be conservative or surgical, depending on the degree of hyperplasia, the presence of atypia and other factors.

Аннотация

В данной статье рассматривается взаимосвязь между гиперпластическими процессами эндометрия и раком, а также актуальные подходы к диагностике и лечению с учетом международной практики и статистики. Гиперплазия эндометрия является одним из факторов риска развития рака эндометрия, особенно при наличии атипии. Для выявления и определения степени гиперплазии и атипии используются ультразвуковое исследование, гистероскопия и гистологическое исследование биопсионного материала. Лечение может быть консервативным или хирургическим в зависимости от степени гиперплазии, наличия атипии и других факторов.

Keywords: endometrial hyperplastic processes, endometrial hyperplasia, endometrial polyp, endometrial cancer.

Ключевые слова: гиперпластические процессы эндометрия, гиперплазия эндометрия, полип эндометрия, рак эндометрия.

Ввеление

Гиперпластические процессы эндометрия — это увеличение толщины слизистой оболочки матки вследствие избыточного роста клеток. Эти изменения могут быть как реактивными (гормональными), так и пролиферативными (дисплазия) [Бородина, М, и Бородин, А, 2018]. В литературе описана взаимосвязь между гиперплазией эндометрия и развитием рака эндометрия [Lacey, J.V., и Brinton, L.A., 2016]. Кроме того, гиперпластические процессы включают также полипы эндометрия. В данной статье мы рассмотрим исследования, устанавливающие связь между гиперпластическими процессами, включая полипы эндометрия, и развитием рака эндометрия, а также актуальные подходы к диагностике и лечению.

Метолы

Для написания данной статьи были использованы научные публикации и источники из национальных и международных баз данных. Результаты исследований сравнивались и анализировались с учетом данных разных авторов и групп исследователей.

Результаты

Взаимосвязь гиперплазии эндометрия, полипов эндометрия и рака эндометрия

Гиперплазия эндометрия может быть классифицирована как простая и комплексная, а также с или без атипии [Мишаков, О, и Харькова, В, 2017]. Простая гиперплазия имеет более благоприятный прогноз по сравнению с комплексной гиперплазией. Атипическая гиперплазия эндометрия, особенно комплексная, считается предраковым состоянием, и риск развития рака эндометрия при этом возрастает в несколько раз [Trimble, C.L., и Kauderer, J., 2015].

Полипы эндометрия также являются гиперпластическим процессом и представляют собой локальное утолщение слизистой оболочки матки. Они могут быть доброкачественными или злокачественными, и в некоторых случаях могут быть ассоциированы с раком эндометрия. Исследования показывают, что наличие полипов эндометрия может увеличивать риск развития рака эндометрия [Mutter, G.L., 2016].

В исследовании, проведенном Радзинским и коллегами [Радзинский, В, и Петров, А, 2019], было показано, что у пациенток с атипической гиперплазией эндометрия риск развития рака эндометрия может достигать 29%, в то время как для простой гиперплазии без атипии этот показатель составляет около 1%. Однако риск развития рака эндометрия у пациенток с полипами эндометрия варьируется от 1 до 4,9%, в зависимости от размера, числа полипов и наличия сопутствующих факторов риска [Бережная, Н. и Шурыгина, А, 2018].

Диагностика гиперпластических процессов эндометрия, включая полипы, начинается с определения клинических симптомов, таких как аномальное кровотечение из матки, боли внизу живота, и неприятные ощущения во время полового акта [Levi, A.W., 2019; Радзинский В.Е. и др., 2017]. Гинекологический осмотр позволяет выявить изменения в размерах матки, аномалии формы и другие патологические изменения.

Ультразвуковое исследование матки и придатков является основным методом в диагностике гиперпластических процессов эндометрия [Радзинский В.Е. и др., 2017]. С его помощью можно определить размеры, форму, эхогенность полипов, а также их местоположение и распределение в полости матки. В некоторых случаях может потребоваться проведение гистеросонографии, когда контрастное вещество вводится в полость матки [Levi, A.W., 2019].

Гистологический анализ биопсионного материала, полученного в результате гистероскопии или дилатации и кюретажа матки, является золотым стандартом в диагностике гиперплазии эндометрия и полипов [Мишаков, О, и Харькова, В, 2017; Радзинский В.Е. и др., 2017]. Это позволяет точно определить степень атипии и установить диагноз.

Лечение гиперплазии эндометрия и полипов зависит от множества факторов, таких как степень атипии, размер и количество полипов, возраст пациентки, желание сохранить фертильность и индивидуальные риски [Радзинский В.Е. и др., 2017]. Варианты лечения могут включать гормональную терапию, в частности прогестиновые препараты и комбинированные оральные контрацептивы [Мишаков, О, и Харькова, В, 2017]. Это может привести к регрессии полипов и улучшению клинических симптомов.

В случае больших полипов, наличия атипии или неэффективности гормональной терапии, может быть рекомендована гистероскопическая резекция полипов [Радзинский В.Е. и др., 2017; Мишаков, О, и Харькова, В, 2017]. Этот метод позволяет удалить полипы с минимальным воздействием на окружающую ткань эндометрия и сохранить фертильность женщины.

Эндометриальная аблация может быть рассмотрена как альтернативный метод лечения для женщин с рецидивирующими полипами, гиперплазией эндометрия или для тех, кто не планирует иметь детей в будущем [Радзинский В.Е. и др., 2017]. Этот метод заключается в уничтожении слоя эндометрия при помощи различных техник, таких как лазерная абляция, радиочастотная аблация или аргоновая плазменная коагуляция. Важно отметить, что этот метод может снизить вероятность будущей беременности.

Гистерэктомия, или удаление матки, является радикальным методом лечения гиперплазии эндометрия и полипов, применяемым в случаях высокого риска развития рака эндометрия, наличия тяжелой атипии или неуспешности других методов лечения [Радзинский В.Е. и др., 2017; Мишаков, О, и Харькова, В, 2017]. Этот метод несет с собой потерю фертильности и может иметь психологические последствия для пациентки, поэтому такое решение принимается с учетом всех возможных рисков и после обсуждения с врачом.

Международная практика и статистика

Согласно международной статистике, рак эндометрия является четвертым по распространенности злокачественным заболеванием среди женщин в мире [GLOBOCAN, 2020]. Особенно актуальна проблема рака эндометрия и гиперплазии эндометрия в развитых странах, где факторы риска, такие как ожирение и изменения гормонального статуса, являются все более распространенными [Weiderpass, E., и Tyczynski, J.E., 2019].

[Радзинского, В., и Петрова, А., 2019] подчеркивают, что ранняя диагностика гиперплазии эндометрия и рака эндометрия является ключевым моментом в успешном лечении. Они также отмечают, что прогнозирование развития рака эндометрия на основе данных о гиперплазии эндометрия может быть весьма полезным для врачей и пациенток.

Согласно международным рекомендациям, включая исследования [Радзинского, В., и Петрова, А., 2019], диагностика гиперплазии эндометрия и полипов включает в себя анамнез, физикальное обследование, ультразвуковое исследование, гистероскопию и гистологическое исследование биопсионного материала [Lethaby, A., и Farquhar, C., 2018].

Лечение гиперплазии эндометрия и полипов может варьироваться в зависимости от степени атипии, размера и числа полипов, возраста пациентки, желания сохранить фертильность и индивидуальных рисков. Международные рекомендации предлагают использование гормональной терапии, гистероскопической резекции полипов, эндометриальной аблации и гистерэктомии в зависимости от конкретной клинической ситуации [Lethaby, A., и Farquhar, C., 2018; Радзинский, В, и Петров, А, 2019].

Профилактика гиперплазии эндометрия и рака эндометрия включает контроль над факторами риска, такими как ожирение, длительное применение эстрогенов без противовеса прогестерона, а также гормональные нарушения, влияющие на эндометрий [Weiderpass, E., и Tyczynski, J.E., 2019].

Меры профилактики могут включать поддержание здорового образа жизни, такого как регулярная физическая активность и здоровое питание для снижения риска ожирения. Также важно проводить регулярные медицинские осмотры и консультации с врачом для своевременного выявления и лечения гормональных нарушений [Радзинский, В, и Петров, А, 2019].

Комплексный подход к диагностике и лечению гиперплазии эндометрия и полипов, основанный на международных рекомендациях и опыте ведущих специалистов, позволяет обеспечить наилучший уход для пациенток, страдающих от этих заболеваний, и снизить риски развития рака эндометрия [Lethaby, A., и Farquhar, C., 2018; Радзинский, В, и Петров, A, 2019].

Таким образом, международная практика в области диагностики и лечения гиперплазии эндометрия и полипов строится на основе многолетних исследований, клинических наблюдений и обмене опытом между специалистами разных стран. Это позволяет совершенствовать методы диагностики и

лечения, а также определять наиболее эффективные подходы к профилактике данных заболеваний [GLOBOCAN, 2020; Weiderpass, E., и Tyczynski, J.E., 2019].

Заключение

Гиперпластические процессы эндометрия, такие как гиперплазия и полипы, являются важной проблемой в профилактике рака эндометрия. Своевременная диагностика и адекватное лечение этих состояний помогают снижать риск развития рака эндометрия и предотвращать его последствия. В данной статье были рассмотрены актуальные подходы к диагностике и лечению гиперплазии и полипов эндометрия на основе как национальных, в том числе своего многолетнего опыта в диагностике, лечении и профилактики рака эндометрия, так и зарубежных источников.

Также были обобщены данные о международной практике и статистике заболеваемости раком эндометрия. Основываясь на анализе имеющихся данных, можно сделать вывод о высокой значимости проблемы гиперпластических процессов эндометрия и их влиянии на развитие рака.

Важность этой темы обусловлена необходимостью развития новых методов диагностики и лечения, учетом факторов риска, таких как ожирение и гормональные нарушения, а также повышением осведомленности медицинского сообщества и общественности о рисках, связанных с гиперплазией и полипами эндометрия. Комплексный подход к исследованию данной проблемы может способствовать снижению заболеваемости и смертности от рака эндометрия, а также улучшению качества жизни пациенток с гиперпластическими процессами эндометрия.

В дальнейшем, необходимо продолжать изучение гиперпластических процессов эндометрия, углублять знания о патогенезе и возможных механизмах развития рака эндометрия. Развитие новых, более точных методов диагностики и персонализированных подходов к лечению позволит значительно улучшить результаты терапии и уменьшить риск осложнений.

Кроме того, необходимо активно внедрять профилактические мероприятия для раннего выявления гиперпластических процессов эндометрия среди населения. Это включает в себя информационные кампании о факторах риска, регулярные медицинские осмотры для женщин среднего возраста и старше, а также повышение квалификации медицинских специалистов для определения наиболее эффективных методов лечения и диагностики в каждом конкретном случае.

Также следует обратить внимание на социальные и психологические аспекты гиперпластических процессов эндометрия. Поддержка пациенток и их семей, снижение стресса и улучшение качества жизни могут способствовать более быстрому восстановлению и успешному лечению. Работа с психологами и социальными работниками также может быть полезной составляющей комплексной терапии.

В целом, международное сотрудничество и обмен опытом между медицинскими учреждениями разных стран позволяют расширить знания о гиперпластических процессах эндометрия и улучшить качество медицинской помощи пациенткам.

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Автор заявляет об отсутствии конфликта интересов.

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PEDAGOGICAL SCIENCES

THE EXTRA-CURRICULUM PHYSICAL WORK AGAINST THE HYPODYNAMY

Zheleva-Terzieva D.

Assistant Professor, PhD in Pedagogy Trakia University, Stara Zagora, Bulgaria

ИЗВЪНУЧИЛИЩНАТА ФИЗКУЛТУРНА РАБОТА В ПРОТИВОДЕЙСТВИЕ НА ХИПОДИНАМИЯТА

Желева-Терзиева Д.

Асистент, доктор Тракийски университет, Стара Загора, България https://doi.org/10.5281/zenodo.7878361

Abstract

The article presents a study in the field of physical education organized by extracurricular associations, schools and societies with sports, games and tourism orientations. The aim is to study the opportunities for additional motor activity, as a countermeasure against hypodynamia, that are provided in the sixth largest city in the Republic of Bulgaria - Stara Zagora, as well as the interest and participation in sports or motor-play activities of 1st grade students. The scientific research was implemented through the pedagogical survey method, conducted in the form of an online survey with parents of 80 first-graders from 5 schools in the specified city.

Based on the results obtained from the research, it can be seen that the sports services provided in the city of Stara Zagora satisfy the majority of the surveyed persons, which is a prerequisite for the active involvement of students, and in turn – for the prevention and maintenance of good health.

Анотация

Статията представя изследване в областта на физкултурната работа, организирана от извънучилищни сдружения, школи и дружества със спортна, игрова и туристическа насочености. Целта е да се проучат възможностите за допълнителна двигателна дейност, като противодействие срещу хиподинамията, които се предоставят в шестия по големина град в Република България – Стара Загора, както и интереса и участието в спортните или двигателно-игровите дейности на ученици от І-ви клас. Научното изследване е реализирано чрез педагогическия метод анкета, проведен под формата на онлайн-проучване с родители на 80 броя първокласници от 5 училища в посочения град.

Въз основа на получените от изследването резултати се вижда, че предоставяните в град Стара Загора спортни услуги удовлетворяват болшинството от изследваните лица, което е предпоставка за активно включване на учениците, а то от своя страна – за профилактика и поддържане на добро здравословно състояние.

Keywords: hypodynamia, sports, students, health **Ключови думи:** хиподинамия, спорт, ученици, здраве

Широкообхватни в научната литература са фактите за недостатъчната за поддържане на добро здраве двигателна активност на подрастващото поколение. Безспорни по реалност са и всички посочени по-долу обстоятелства, облагодетелстващи т.нар. хиподинамия - недостатъчният обем от планирани училищни дейности, свързани с движение, прекалено ангажираното ежедневие на учениците с учебния процес и подготовката на уроците, липсата на свободно игрово пространство в близост до всеки дом, наличието на повишен интерес към компютърните игри и техническите средства и намален такъв към активните игри. Към всичко това за съжаление се добавя и промяната в културата на хранене, водеща до наднормено тегло и затлъстяване [1, с. 4506] още от ранна детска възраст.

Училищното образование в лицето на Министерството на образованието и науката в Република

България все повече обръща внимание върху нивото на двигателна активност на учениците. В тази връзка се въведе т.нар. трети допълнителен час по физическо възпитание и спорт във всички образователни степени и етапи на училищната образователна система. В действащата програма от септември 2016 г. той се провежда като час за спортни дейности с основни задачи "повишаване на двигателните умения и навици (...) развиване на специфични за вида спорт техническа, тактическа и психологическа подготовка (...) формиране на траен интерес по съответния спорт" [3, с. 2].

Въпреки увеличаване на възможностите за двигателна активност с един час седмично, общото времетраене на различните форми на работа по физическо възпитание в училище не покрива изцяло изискуемия минимален обем, посочен от здравни специалисти в научни изследвания [7, с. 658]. Някои от причините са незадължителният характер на

извънкласната физкултурна дейност, незаинтересоваността и недобрата формула за проява на активност в това отношение от педагозите. В помощ идва извънучилищната дейност, извършвана от външни дружества, школи, клубове и сдружения с нестопанска цел със спортна, игрова или туристическа насочености.

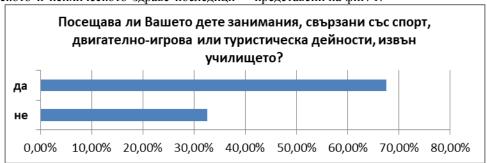
Всеизвестно е, че при работоспособния човек липсват болестни симптоми, но здрав е този, чиито умствени, физически и психически компоненти на личностно-дейностния потенциал са в хармония [5, с. 1]. Към физическото, психическото и социалното здраве се добавят още емоционалното, интелектуалното, духовното, екологичното и професионалното здраве на човека [6, с. 43-44]. Същото се отнася и за подрастващите, които само чрез стремеж и възможности за поддържане на добри нива на различните компоненти на здравето, могат да са личностно- и общественополезни. Стратегическа цел №1 на Националната здравна стратегия, приета през 2022 г., е устойчиво подобряване на здравето и среда, която го подкрепя [4, с. 8]. В Закона за физическото възпитание и спорта е заложено, че спортът и туризмът трябва да се поощряват и подпомагат от общините и държавата, като база за профилактика и укрепване на здравето и повишаване на физическата дееспособност на хората [2, чл. 30. (1)]. "Създаването на условия за занимания с физически упражнения и спорт от населението е неразделна част от социалната политика на общините за съставните им населени места" [2, чл. 30. (2)]. Интересът на изследователския екип към темата се провокира от тревожните през последните години за физическото и психическото здраве последици от хиподинамията, поместени в редица нормативни и научни документи [4, с. 11, с. 14; 8, с. 4] и в тази връзка какви възможности за извънучилищна спортна, туристическа и игрова дейности съществуват в град Стара Загора.

Организация за провеждане на изследването

Явлението хиподинамия се проявява особено силно след започване на училищното образование, при което спонтанната активност на подрастващите рязко намалява. Настоящото проучване е насочено към изследване на интереса, активността и удовлетвореността на първокласниците и мнението на техните родители. Включените в проучването лица са 80 ученици от първи клас от пет училища на град Стара Загора – V ОУ "М. Станев", IV ОУ "К. Христов", ІІ ОУ "П. Р. Славейков", СУ "М. Горки" и НУ "Д. Благоев". Използваният метод на педагогическите изследвания е анкета, проведена като онлайн проучване сред родителите на изследваните лица. Въпросите в анкетната карта са 9 на брой – 2 със затворен тип (скалирани), 4 – с отворени и 3 – с алтернативни отговори.

Представяне и анализ на резултатите

От отговорите на първия въпрос, насочен към получаване на информация относно извънучилищните двигателни активности на децата, се вижда, че 67,5 % (54 броя) от тях практикуват избран вид спорт или двигателно-игрова дейност, а останалите 32,5 % (26 броя) – не практикуват нищо. Т.е. всеки трети първокласник не е включен в никаква допълнителна двигателна дейност извън училищните занимания по физическо възпитание. Резултатите са представени на фиг. 1.



Фигура 1. Резултати от отговорите на първи въпрос

Резултатите от отговорите на втория въпрос са посочени в табл. 1, където е представено разнообразието на видовете спортно-игрови дейности, ко-ито практикуват респондентите. На въпроса отговарят само родителите, които са посочили на първия

въпрос отговор "Да", но 5-тима от изследваните лица практикуват две спортни дейности едновременно, поради което броят на посочените активности нараства на 59.

Таблица 1.

Резултати от отговорите на втори въпрос

№ по ред	Спортно-игрови дейности	Брой практикуващи
1	Народни танци	13
2	Футбол	10
3	Плуване	7
4	Лека атлетика	6
5	Баскетбол	5
6	Балет	4
7	Шахмат	3
8	Карате	3
9	Художествена гимнастика	2
10	Спортно ориентиране	2
11	Спортни танци	1
12	Скокове на батут	1
13	Бадминтон	1
14	Тенис	1
Общо		59

От данните в горната част на таблицата се вижда, че видовете спортно-двигателни дейности с висока степен на предпочитане са народните танци и футболът. Плуването, леката атлетика, баскетболът и балетът са на следващите по практикуване места.

На третия поред въпрос от анкетната карта отговарят само родителите на първокласниците, които не практикуват допълнителна двигателна активност извън училището. Изследователският екип търси отговор на въпроса "Имате ли общо желание детето да се включи в тренировъчен процес и с каква двигателна дейност то желае да се занимава?". Всички отговори на първата част на въпроса с изключение на два, изразяващи нежелание да се спортува, са положителни, а предпочитанията за видовете спортно-двигателни дейности са представени в табл. 2. При един от положителните отговори не е посочено предпочитание за вид активност.

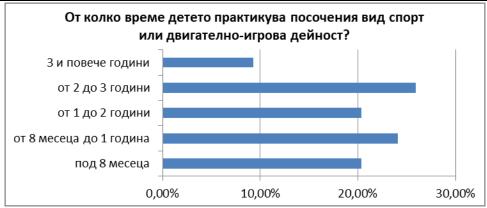
Таблица 2.

Резултати от отговорите на трети въпрос

№ по ред	Предпочитана дейност	Брой отговори
1	Плуване	6
2	Баскетбол	5
3	Народни танци	3
4	Лека атлетика	2
5	Шахмат	2
6	Бойни спортове	2
7	Волейбол	1
8	Футбол	1
9	Колоездене	1
Общо		23

От представените в таблицата данни се вижда, че 92,31% от респондентите имат намерение за бъдещо участие в извънучилищни физкултурни занимания, като 91,3% от тях са посочили дейности, свързани с движение, и само двама (8,7%) предпочитат умствената дейност посредством обучение и игра на шахмат.

Четвъртият поред въпрос проучва продължителността на извънучилищните занимания, свързани с двигателно-игрова или спортна активности. Отговори на въпроса дават лицата, отговорили утвърдително на първи въпрос. Резултатите нагледно са представени на фиг. 2.



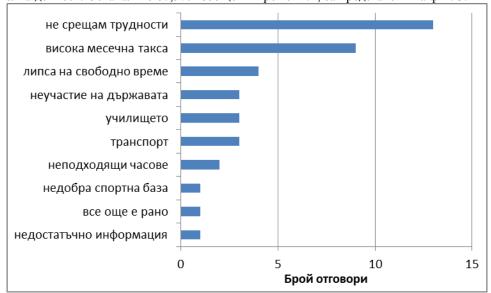
Фигура 2. Резултати от отговорите на четвърти въпрос

От данните, представени на фигурата, става ясно, че повече от половината ученици (55,56%) практикуват допълнителна физкултурна дейност още от предучилищна възраст (повече от година), близо 1/4 (24,07%) – преди да започнат обучението си в училище и малко над 1/5 от тях (20,37%) започват да спортуват по време на учебния процес в първи клас.

Осъзнавайки ролята на двигателната дейност за здравословното състояние на подрастващите само 12,5% от родителите посочват, че имат намерение да прекратят участието на детето си в настоящите физкултурни занимания, но само и единствено с цел то да бъде заменено с участие в друг вид двигателна дейност. Останалите 87,5% изобщо

не са се замисляли да бъде прекъснат или заменен тренировъчния процес по практикуваната в момента вид двигателна активност. Всички деца, посещаващи допълнителните занимания, изразяват голямо желание, а понякога и нетърпение за включване в тях. Посочените резултати са проучени чрез въпроси 5, 6 и 7 от анкетната карта.

Особено важни за изследването са трудностите, които родителите и децата изпитват, а част от респондентите ги посочват като причина да не са направили първата крачка към допълнителната извънучилищна физкултурна дейност. Получените резултати от въпрос 8 – "Какви трудности срещате в това отношение и какво според Вас трябва да се промени?", са представени на фиг. 3.



Фигура 3. Резултати от отговорите на осми въпрос

От информацията, представена на фигурата, се вижда, че 67,5% от родителите изпитват различни по форма трудности във връзка с извънкласната спортно-двигателна дейност на децата си и само 32,5% – не срещат никакви затруднения. Като найголяма по степен на трудност се посочва високата месечна такса (22,5% от всички отговорили). Следват липсата на свободно за допълнителни занимания време (учебна пренатовареност на първокласниците), недостатъчната активност от страна на държавните институции, необходимият транспорт на децата за придвижване до спортните бази, не-

подходящите начални часове на заниманията, недоброто състояние на материалната база, недостатъчната информираност на обществото по разглеждания проблем. Един от отговорилите преценява, че все още е рано детето му да практикува дейност, свързана със спортна активност.

Чрез последния в анкетната карта въпрос 9 се проучва степента на удовлетвореност на включените в изследването лица по отношение на предлаганите в града спортни, туристически и двигателно-игрови услуги. Резултатите са нагледно представени на фиг. 4.



Фигура 4. Резултати от отговорите на последния въпрос №9

От данните се забелязват високите нива на положителните отговори "Да" и "По-скоро да", които показват доста висока степен на удовлетвореност (80%). Малка е частта на родителите (20%), които мислят, че има още какво да се желае по отношение на броя и разнообразието на възможностите за извънучилищни спортно-игрови двигателни дейности, които се предлагат в град Стара Загора.

Изводи и препоръки

След проведеното изследване могат да се направят следните $u360\partial u$:

- установява се, че голям брой ученици от Іви клас спортуват допълнително извън училището, като желанието им за участие и намеренията им за продължаване на дейността са трайни;
- съществуващото разнообразие от извънучилищни спортно-двигателни активности в град Стара Загора е голямо, което удовлетворява родителите и децата;
- трудностите, които включените в изследването лица изпитват в областта на извънучилищната спортно-двигателна, туристическа и игрова дейности, пораждат въпроси, приоритетно насочени към държавните институции.

И следните препоръки:

- към държавата: да се обърне внимание на учебната пренатовареност, която отнема голяма част от свободното за двигателна дейност време на учениците; да се подобри формулата за стимулиране на външните дружества, предлагащи спортно-игрова дейност на подрастващите, с цел финансово олекотяване на родителите;
- към общината: да се подобри състоянието на общинската спортна база, в т.ч. и училищната; целенасочено да се промени транспортната схема в определен времеви период за улесняване придвижването на децата до местата за спорт; да се подобри информационната осведоменост на населението по разглеждания проблем;
- към училището като институция: да се повиши броят на училищните спортни клубове, занимаващи се с извънкласна спортна дейност;

• към външните спортни и туристически дружества: да се вземат под внимание затрудненията на родителите във връзка с часовете на провеждане на заниманията.

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THE EXPECTATIONS OF MIDWIFERY STUDENTS TOWARDS THEIR PROFESSION AND ACADEMIC STUDIES AT THE MEDICAL UNIVERSITY OF TIRANA

Etleva Rustami, Alma Pula, Elida Gjata, Elida Peka

Medical University of Tirana, Faculty of Technical Medical Sciences. Tirana. Albania https://doi.org/10.5281/zenodo.7878385

Abstract

Background: Due to the continuous development and changes in the provision of health care, lifelong learning, as a concept and a practical activity, has gained more and more attention among nursing professionals. Continuing education is important for the individual and for society as a whole. For this reason, continuous efforts must be made to promote the continuation of education. The study aimed to explore the professional expectations of the students studying Midwifery at the Bachelor level, regarding the continuation of the education at the master's level.

Methods. A cross-sectional study involving 145 midwifery students were carry out during October- November 2022, in the premises of Faculty of Technical Medical Sciences. An international standardized questionnaire, validated in Albania language was used to collect information about midwifery students. Basic socio-demographic information was collected as well.

Results: The students referred that the midwifery branch of study has been personal choice and that on average one can find work in this profession, the career is relatively safe and that the profession of midwife will ensure economic well-being for them. They claimed that this profession often belongs to a satisfactory social status.

Conclusions. Although the students had willingly chosen to continue the midwifery diploma, since they thought it would provide them with a dignified future. In the study was not prove effective as a significant number of students were seen transferring to the master's degree in nursing.

Keyword: midwifery students, continuing education, perception, expectation.

Introduction: The Health System in Albania is public. The state assures most part of the services which is offered to the population, in the field of promotion, prevention, diagnose and cure[1]. Institutions of Higher Education in the Republic of Albania enjoy academic freedom, financial autonomy, organizational and personnel selection possibilities, in accordance with the legislation in force[2]. The University of Medicine, Tirana (UMT), is the largest center public teacher of undergraduate and postgraduate training in Medical Sciences, in Republic of Albania. The university offers the worthiest professional expertise in didactics, scientific research and in the preparation of specialists of all fields of medicine [3].

Nursing and Midwifery Education in Albania is at the University level. After students have finished the first study cycle (Bachelor), students can continue further education and their knowledge in second cycle (Master) and third cycle (Dr), to complete their professional studies [4]. As it is also seen in tab no. 1, not all students who complete the bachelor's level attend Master's level studies.

The continuous development and changes in the provision of health care, lifelong learning is a very important issue concerning all faculties [5]. For this reason, continuous efforts should be made to encourage continuing education [6]. According to the recommendations of the Bologna declaration: "Based on the desire that European societies become increasingly knowledge-based, higher education is one component essential of socio-economic and cultural development.

At the same time, the increasing need for skills and competencies requires higher education to respond in new ways." Reform of Bologna is the key to building the confidence necessary for successful mobility learning, cross-border academic cooperation and mutual recognition of periods of study and qualifications acquired abroad [7].

Migration of health workers, usually from low-income countries and medium, towards more developed countries, is a growing phenomenon worldwide [8].

The number of Nurses and Midwives, who are looking for opportunities to work abroad, is increasing speedily, in Albania. According to an article published on June 20, 2022, in Journalist, the number of immigrants varies from country to country. It can be seen that, in 2020, they left Albania over 15 thousand health workers or 23,854 people in total, while they are from Kosovo, dismissed 8,724 Health Care professionals[9]. Germany is the largest market emigration of Health Workers. The opportunity created to work outside is being used by the younger generations, reflecting on the ever-increasing trend of the number of applicants seeking to study at the Faculty of Technical Medical Sciences, especially in the Diploma of Nursing and Midwifery. The most part most of them mention emigration as a reason to pursue their first studies in the Diploma of Nursing and Midwifery. If we look at the quotas approved by the Ministry of Education and e Sports of the Republic of Albania, study quotas at the University of Medicine Tirana have come growing [10].

Table nr.1.

Credite of the accentance in the University of Medicine	Tirono Foculty of Tachnical Medical Sciences
Credits of the acceptance in the University of Medicine	, Thana. Faculty of Technical Medical Sciences.

Academic Year	Bachelor Nursery	Bachelor	MP	MP	MSH	MSH
Academic rear	Dachelol Nulsely	Midwifery	Nursery	Midwifery	Nursery	Midwifery
2022-2023	400	100	160	30	120	25
2021-2022	300	60	160	50	100	25
2020-2021	301	60	160	49	80	19
2019-2020	277	47	180	50	78	17

To control emigration in rising, to the professions of Health. Faculty of Technical Medical Sciences has increased salaries and incentives for professionals of the health. The Minister of Health, during her speech at the opening of the SP Congress, affirmed that until the end of this governing mandate, the salaries of Doctors and Nurses will increase, up to the extent of 40%. Despite efforts to manage new situations created as a result of emigration health workers, for the first time in the history of FSHMT, the master's program in midwifery diploma. At a time when we have increased requests to start the study program first level in the midwife branch, we see a decrease in demand, to continue the second level of the study. The increase in the presence of nurse recruitment offices in Albania is an indicator of the growing demands of recent graduates to leave the country immediately after they diploma at the first level of study.

According to the WHO World Health Statistics 2022 report, many countries continued to face lack of health staff, in the main jobs and fought to achieve one balance in the distribution of health care workers [11]. This climate has stimulated emigration of health workers in Albania to developed countries. According to the report CGFNS Nurse Migration Report 2022: CGFNS received over 17,000 applications for 116 countries, a 44% increase from 2021 and 109% increase from 2018 [12]. CGFNS International Inc. is an immigration-neutral non-profit organization that helps professionals' healthcare educated foreigners to live and work in their chosen country, evaluating and validating their academic and professional credentials [13]. The main purpose of this study was to explore the perception of the students of the Bachelor Diploma in Midwifery, in relations with the continuance of education in master study level. In understanding more about the wishes of the students of midwifery about the continuance of the education, here are these questions:

- 1- What is the perception of the students in midwifery profession?
 - 2- What do they expect in a professional way?
- 3- Would the students like to continue their master studies level?
- 4- Does the year of study affect the general perception of the future of the midwifery profession?

- 5- Does the school year affect in planning to follow the master studies?
- 6- Does the income effect on dealing students expenses in their choices?

Methodology and analysis of data.

This is a cross-sectional study. In this study are included the students of the first cycle of study in the Midwifery branch for the academic year 2022 – 2023, Faculty of Medical Sciences at the University of Medicine.

We have distributed 145 questionnaires mainly with closed questions. The questionnaire is built based on the expertise of 10 experts. The validity was tested from a champion of 40 students. After the test the relevant changes were reflected in the questionnaire. The questionnaire was with self- administration. The sampling was simple random. The time of completion was October-November 2022.

The selection criteria of the students in the study were: to be a student of the first cycle of study in the Midwifery branch, students who are available, students who wish to participate in the study.

The exclusionary criteria of the students in the study were: being a student of other branches at Faculty of Medical Sciences, the student refuses to participate in study.

The data are calculated with the SPSS 15.00 program. Chi-Square test and Correlation were used for statistical analysis. It was considered significant the p value ≤ 0.05 (5%).

The research proposal was approved by the ethics council. The students recruited in the study were informed about the study and its purpose, the preservation of anonymity and were assured that the collected data will be used for study purpose only.

The results

The results were reflected by relying into a conclusion of data found for every definite target of the study. The age of the participants in our study ranges from 17 years to 21 years. The average age is 18.94 years ± 0.922 years. Referring to the year of study that they are currently attending, 54.9% of the participants in our study are in the first year, 24.3% in the second year and 20.8% in the third year. Of these participants, 72% live at home and 28% in a dormitory.





Distribution by age (%) Distribution by sex (%)





Distribution by location Distribution by the year of study

Findings according to study objectives:

What is the students' perception of the midwifery profession?

24.3% refer that there was no recommendation at all, 23.6% a little, with equal percentages 18.1% on average and always and 16% often. In response to the question of whether it is worth working as a midwife in Albania, 34% refer that it is worth it on average, 33.3% it is worth it a little, followed by 13.9% often, 13.2% not at all and 5.6% always. Only 15% of the participants in our study affirm that they chose the midwifery branch because one of their family members or a relative works as a midwife, and 85% say that this is not true.

The 32.6% of respondents always recommend the profession of midwife and only 2.8% do not recommend this profession at all. In response to the question related to career security as a midwife, the majority (38.2%) refer that on average the career in this profession is safe, followed by often safe (30.6%), slightly and always safe with a percentage of equal to 14.6% and only 2.1% think that it is not safe at all.

About 40% refer that the midwife profession often belongs to a satisfactory social status, followed by an average of 33.3%, 19.4% always and 9% a little.

In a general look at the perception of the midwifery profession, it results that students who follow the midwifery study program generally have a neutral opinion with a positive tendency about this profession. They consider it moderately easy to find work in this profession. This profession can offer you, on average, a secure career and economic well-being. Students are more optimistic about the satisfactory social status that this profession can offer you. However, they are more skeptical if it is worth it to work as a midwife in Albania.

Regarding the selection of this study program, it is mainly a choice made by choice and not recommended, as well as they would recommend it as a profession to others.

What are their professional expectations?

The students participating in our study in 62% of cases affirm that they chose the midwifery branch because they can immediately find a job. Regarding the choice of midwifery studies as it can provide you with a good career in the future, 84% affirm and 16% deny this finding.

80% of the respondents affirm that they chose the midwifery branch because it can provide you with social-economic well-being, while 20% deny that they chose this branch for such a reason. The majority, 90%, affirm that they have chosen the midwifery branch because they can secure a job as a midwife in the countries of the European Union. While 10% deny this finding.

Does the year of study affect the general perception of the future of the midwifery profession?

There is a difference (p=0.050) and a negative relationship (p=0.016) statistically significant between question 10 and income to afford studies.

With the increase in income, students are more likely to state that it is true that they have chosen to study midwifery because they can immediately find a job.

There is a statistically significant difference (p= 0.036) and a statistically non-significant negative relationship (p= 0.070) between question 3 and the year of study.

We can say that third-year students are more likely to say that the profession of midwife provides little or no economic well-being.

There is a difference (p= 0.028) and a negative relationship (p= 0.008) statistically significant between question 4 and the year of study. As the year of study increases, students are more likely to express that the profession of midwife does not belong to a satisfactory social status.

There is a difference (p=0.001) and a positive relationship (p<0.001) statistically very significant between question 17 and the year of study.

As the year of study increases, students are more likely to express that they plan to continue their master's studies after completing the first level of study.

Does the year of study affect planning to pursue master's studies?

There is a difference (p= 0.014) and a positive relationship (p= 0.012) statistically significant between question 11 and the year of study. As the year of study increases, students are more likely to state that the statement that they have chosen midwifery is wrong because they can ensure a good career in the future.

There is a difference (p=0.01) and a negative relationship (p=0.034) statistically significant between question 7 and gender. So women are more likely to say that in Albania it is not worth working as a midwife.

There is a difference (p= 0.030) and a positive relationship (p= 0.010) statistically significant between question 12 and the year of study. As the year of study increases, students are more likely to say that the assertion that they have chosen midwifery is wrong because they can ensure social-economic well-being.

Does income to meet student expenses influence their choices?

Regarding the income to afford the studies, 61.1% report that they have an average income, 21.5% have an insufficient income and only 17.4% report that they have a satisfactory income.

Our respondents in 50% of cases refer that the profession of midwife provides economic well-being on average, 25% refer that this profession often provides economic well-being, 13.9% a little, 10.4% always and 0.7% not at all.

There is a difference (p=0.046) and a positive relationship (p<0.001) statistically very significant between question 1 and income to afford studies.

With the increase in income, students are more likely to say that often or always it is easy to find a job in the midwifery profession.

There is a statistically insignificant difference (p= 0.349) and a positive relationship p= 0.047) statistically

significant between question 2 and income to afford studies.

With the increase in income, students are more likely to say that often or always a career in the midwifery profession is safe.

Discussion

In a general look at the perception of the midwifery profession, it results that students who follow the midwifery study program generally have a neutral opinion with a positive tendency about this profession. They consider it moderately easy to find work in this profession. This profession can offer, on average, a secure career and economic well-being. Students are more optimistic about the satisfactory social status that this profession can offer to them. However, they are more skeptical if it is worth it to work as a midwife in Albania. Regarding the selection of this study program, it is mainly a choice made by choice and not recommended, as well as they would recommend it as a profession to others. The students' answers identify the main reasons why they would not want to continue the second level study program. The reasons are listed there: emigration, the lack of accreditation of the program, the decision to start working in the profession, the opinion that the program is not recognized abroad and the high cost of education.

Conclusion

There are several reasons why students who completed the bachelor's program did not register to continue at the master's level of study. The professional thoughts and expectations of the students go in a positive professional direction. The main reasons why they do not decide to continue their master's studies are related to security for the future, well-being, their demand for a better life.

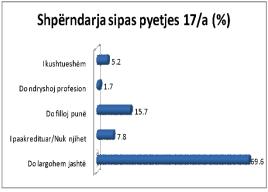


Fig.1

Study is expensive / Change of Carrier / Will start working first / is not yet accredited/I will leave the country.

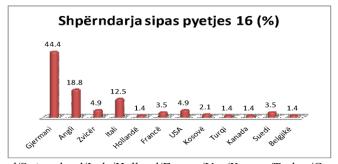


Fig.2Germany/England/Switzerland/Italy/Holland/France/Usa/Kosovo/Turkey/Canada/Sweeden/Belgic.

Recommendations

Based on the responses of the students, it seems clear that they need more information about their professional future, issues of accreditation, recognition and validity of the diploma. Lack of complete information affects perceptions and decision-making about their professional future. Their professional view about the possibilities of the future should be a goal in itself and clear policies should be drawn up to ensure that students know everything concerns aspects and professional decisions.

In the study were included only students studying midwifery at the University of Medicine, perhaps the inclusion of more universities would provide a more complete picture of the situation. Even though, again the students' concerns are clearly identified and should be addressed. In the future more comprehensive studies may be undertaken to ensure that all students concerns are identified.

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WAYS TO INCREASE THE MOTIVATION OF STUDENTS TO READ LITERATURE

Abaibekova K.

СПОСОБЫ ПОВЫШЕНИЯ МОТИВАЦИИ ОБУЧАЕМЫХ К ЧТЕНИЮ ЛИТЕРАТУРЫ

Абайбекова К. https://doi.org/10.5281/zenodo.7878393

Abstract

The article is devoted to the issue of increasing interest in reading fiction, ways of motivating reading as a tool and means of inducing them to cognitive activity.

Аннотапия

Статья посвящена вопросу активизации интереса к чтению художественной литературы, способам мотивации к чтению как инструмента и средства их побуждения к познавательной деятельности.

Keywords: reading motivation, method, cognitive activity, reading culture, reading strategies **Ключевые слова:** мотивация чтения, метод, познавательная деятельность, читательская культура, стратегии чтения

Актуальность проблемы активизации мотивации обучаемых к чтению обусловлена следующими обстоятельствами: 1) модернизация российского образования предъявляет повышенные требования к воспитанию интеллектуальной, нравственно совершенной, эмоционально развитой молодёжи в образовательных учреждениях. И это обусловлено моральной деградацией части социума, вызванной усилением рыночных отношений в обществе потребления, формированием их маркетингового сознания, засильем массовой культуры, главными ценностями которой признаются потребительские и материальные. Духовные ценности общества предаются забвению. А.З. Шамсутдинова утверждает, что молодой человек, оказавшийся под влиянием мировоззренческих установок общества потребления, попадает под власть антиномий. Основное противоречие в этом случае заключается в разрыве между разумом и интеллектом. Разум, способный творить добро и гармонию, не сводится к интеллекту как к способности решать задачи по преодолению этого разрыва [1, 148]. Д.С. Соммер также отмечает, что незнание моральных ценностей способствует снижению духовного уровня человечества, так как, если у него не будет потребности в высших ценностях, то оно не сможет добиться морального и духовного прогресса и, скорее всего, деградирует» [2, 110]. Причиной, снижающей уровень духовности молодёжи, является отсутствие интереса ее к чтению художественной литературы. По мысли Е.А. Гуськовой, главной причиной снижения интереса к чтению у подрастающего поколения является тот факт, что компьютер и различные гаджеты стали занимать ведущее место среди форм проведения досуга [3, 573]. И.В. Сосновская утверждает, что существует еще ряд обстоятельств, ведущих к кризису читательской культуры: смена интеллектуальных технологий освоения знаний (книга как вербальный источник знаний уступает первенство визуальным), смена каналов передачи информации и культуры, смена посредника [4].

Для того, чтобы пробудить у обучаемых интерес к чтению художественной литературы, следует повысить мотивацию их к предмету «литература». Вопрос о мотивации как «об особом психическом процессе можно обсуждать только в рамках проблемы порождения деятельности и заданных обществом субъекту активности действий, поскольку мотивация является психическим обеспечением порождения деятельности субъектом» [5, 76]. Мотивация понимается также как «методы, инструменты и средства их побуждения к познавательной деятельности, к активному освоению материала по изучаемым дисциплинам» [6,12].

Для формирования у обучаемых мотивации к чтению художественной литературы следует использовать ряд педагогических приемов, например, метод проблемного освоения нового знания. В этом случие следует преподнести новый материал таким образом, чтобы вызвать эмоциональное восприятие темы. С этой целью следует использовать метод проблемного изложения темы, при котором ознакомление с темой занятия осуществляется путем создания ситуации затруднения, выявления заключенного в теме противоречия, например, при изучении темы «Имя прилагательное» по предмету «Профессиональный русский язык», акцентируется внимание на изучении качественных прилагательных «гордый-горделивый». Для создания проблемной ситуации преподаватель задает проблемные вопросы: почему у данных однокоренных прилагательных разные значения? Для выявления этого: 1) сопоставьте определения слов по «Словарю русского языка»: гордый: обладающий чувством собственного достоинства, самоуважения [7, 332]; горделивый: исполненный сознания своей ценности, важности, превосходства [7, 332]; 2) подготовьте презентацию поведения гордого и горделивого человека. Выявите различия в их поведении и объясните, чем это вызвано; 3) обратите внимание на события, происходящие в романе Джейн Остин «Гордость и предубеждение». Посмотрите фрагмент из

одноименного кинофильма, сравните поведение героя мистера Дарси в начале романа, когда он демонстрирует поведение горделивого, заносчивого человека, кичащегося своим богатсвом, презирающего мелких джентри и в конце, когда он становится гордым человеком, полным собственного достоинства, достойным уважения других людей и любимой девушки. Почему в нем произошли такие перемены? Акцентируйте внимание на тех ситуациях, в которых демонстрируются эпизоды пробуждения любви Дарси к мисс Элизабет, а также на те ситуации, когда Элизабет отвергает Дарси, а впоследствии в ней пробуждается любовь к нему. Почему это происходит? Какой поступок совершил Дарси, что окружающие стали гордиться им? Чтобы ответить на эти вопросы, прочитайте роман Джейн Остин, дайте оценку поведению главных героев (мистера Дарси и Элизабет). Вызвало ли их поведение, их любовь, их страдания эмоциональное сочувствие у вас?

Данные проблемные вопросы и проблемные ситуации (демонстрация слайдов) пробуждают интерес студентов к чтению романа, повышают «мотивацию как совокупность внутренних и внешних движущихся сил, которые побуждают человека действовать специфическим, целенаправленным образом» [6, 127]. Для повышения мотвации студентов к чтению данного романа можно использовать метод применения стратегии чтения.

Стратегия определяется И.А. Зимней как прием определения целей, задач субъектов деятельности, их подготовки и распределения по соответствующим задачам. Она включает в себя также разработку способов, методов, организационных форм стратегий [8]. В.В. Сметанникова выделяет десять стратегий чтения, такие, как: 1) стратегия техники чтения; 2) стратегия видов чтения (вслух и про себя); 3) стратегии понимания, связанные с характеристиками текста; 4) стратегии, связанные с организацией деятельности чтения (этапы работы с текстом); 5) метакогнитивные, когнитивные, социально-аффективные стратегии; 6) стратегиии, связанные с когнитивными и эмоционально-волевыми характеристиками читателя; 8) стратегии, связанные с характеристиками контекста; 9) стратегии работы с объемными текстами (книгами); 10) контрольно-аффективные стратегии [9, 59]. Из этих стратегий мы выбираем стратегию работы с книгами. При использовании данной стратегии применяем, в первую очередь, предтекстовую стратегию. Г.В. Пранцова и Е.С. Романичева характеризуют ее как предтекстовую орентировочную деятельность, включающую в себя: 1) постановку цели чтения; 2) определение характера текста; 3) просмотра его заголовка и подзаголовков; 4) предположения о замысле его написания [10, 32]. С.Н. Макухина предлагает использовать следующие предтекстовые стратегии: 1) глоссарий (актуализация и повторение словаря, связанного с темой текста); 2) ассоциативный куст (ознакомление с ключевыми словами заголовка); 3) антиципация (предвосхищение того, о чем будет говориться дальше); 4) «прогнозирование» (работа с эпиграфом текста); 5) «ориентиры предвосхишения» (работа с предварительными суждениями учащихся); 6) образ текста (сочинение рассказа по ключевым словам); 7) иллюстрация содержания (визуальное воприятие текста).

Для пробуждения интереса к чтению романа А. Потемкина «Кабала» мы используем набор действий, предлагаемых обучаемым преподавателем с целью достижения совместной цели. Цель использования предтекстовых стратегий — вызвать интерес к чтению романа. Для достижения этой цели решаются следующие задачи: 1) выяснить, почему автор назвал свой роман «Кабала» 2) определить, в какую кабалу попадают герои романа.

Для решения этих задач преподаватель предлагает обучаемым использовать следующие предтекстовые стратегии: 1) стратегия «заголовок»; 2) стратегия «антиципация»; 3) стратегия выявления сюжетной линии книги; 4) стратегия постижения намерений автора; 5) работа с образом текста (сочинение обучаемыми краткого рассказа о сюжете текста); 6) показ основного содержания романа по видео.

Первая предтекстовая стратегия «Заголовок» способствует пониманию темы романа. Заголовок «Кабала» актуализирует смысл романа. Это «кабала жизненных обстоятельств, в которую попадают герои». Стратегия антиципации направлена на предвосхищение того, что будет дальше. Для этого следует прочитать первые фразы текста: Ну вот, Третье кольцо. До Ярославского вокзала уже недалеко, Моя кочегарка перестает подбрасывать в сознание опийное топливо, начинается кумар: со слов медиков, предтеча абстиненции, когда в организме догорают последние клочья этого самого материала (А. Потемкин. Кабала, с.11). Данные начальные фразы позволяют предположить, что речь идет о попавшем в кабалу наркотиков наркомане. Обучаемые предвосхишают такое событие в романе, однако преподаватель обращает внимание обучаемых на то обстоятельство, что в кабалу могут попасть и другие люди, не имеющие отношения к наркотикам. Какие же это люди? Кто еще попадает в кабалу? Это заинтересовывает обучаемых. Для выяснения этого следует ознакомиться с сюжетной линией романа и в этих случаях необходимо выяснить намерения автора, заключающиеся в стремлении его описать жизнь людей, попавших в кабалу наркотиков, а также в кабалу денег. Последняя предтекстовая стратегия направлена на осмысление содержания текста. Для этого читателю необходимо осмыслить три вида информации текста, а именно: 1) содержательно-фактуальную; 2) подтекстовую; 3) концептуально-содержательную. Для понимания содержательно-фактуальной информации читатель выявляет информацию по следующей схеме: 1) кто? 2) где? 3) когда? 4) почему? 5) с какой целью? Подтекстовая информация скрытая, она имплицитна. Скрытые смыслы подтекстовой информации расшифровываются благодаря таким средствам, как использование метафоры, имплицитной детали, кольцевого повтора. Применяя прием метафоры, читатель вникает в переносное значение слова «Кабала», которое используется не в значении «долговая кабала», а «кабала жизненных обстоятельств» (кабала наркотиков, кабала денег). Концептуально-содержательная информация передает сведения об идеях автора.

Послетекстовая стратегия направлена на выявление того, как читатель усвоил содержание текста. Для этого он должен заполнить таблицу №1:

Таблица 1

Содержание этапов чтения текста и выявления типов информации

Название этапа Описание этапа		Усвоение информации	Содержание инфор- мации
Предчтение	Использование предтек- стовых стратегий	Фактуально-содержательная информация (выявление и описание ситуаций, в которых принимают участие главные герои романа)	Выявление информации по схеме: кто, где, когда, почему?
Чтение (исполни- тельный этап)	Следование за героями романа; осмысление и запоминание событий: выявление подтекста романа.	Усвоение подтекстовой информации текста	Использование приемов выявления подтекстовой информации
Постчтение (рефлективно-оценивающий этап)	Краткое изложение содержания текста (устно)	Усвоение концептуально-содержательной информации текста	Выявление идеи автора, размышления о ней

Следующим приемом повышения мотивации к чтению художественной литературы является актуализация диалоговой позиции обучаемого. По мысли Н.П. Терентьевой, такая позиция является принципиально важной в процессе становления читательской мотивации и самоактуализации [11, 88]. Исследователь считает возможным вовлечь читателя в диалог после прослушивания им лекции И.А. Бродского и аналитического чтения его. Для такого чтения читатель должен выполнить следующие задания: 1) выделите в лекции И.А. Бродского мысли, интересные для вас; 2) найдите утверждения, с которыми вы хотели бы поспорить; 3) приведите дветри цитаты и прокомментируйте их; 4) прочитайте вслух самую важную из цитат; 5) обсудите их в процессе диалога с другими обучаемыми [11].

Возможным представляется и актуализация диалогов читателя с автором. В этом случае читатель активизирует внутреннюю мотивацию, ибо он получит ответы на свои вопросы, если только использует внутренною мотивацию, заключающуюся в понимании смысла произведения. Следует знать, что чтение художественной литературы носит диалогический характер, который «требует совместных усилий не только со стороны пишущего, но и со стороны читающего, у него должны быть потребность и способность вступать в диалог с отсутствующим собеседником, хотя и представленным его инобытием — литературным произведением» [12, 714].

Для того, чтобы понять содержание текста, необходимо иметь представление о его смысловой структуре, т.е. читатель должен вникнуть во все смыслы, вложенные автором в художественный текст. В современных исследованиях текст определяется как множество языковых знаков, которые приобретают смысл в коммуникации. Именно в процессе коммуникации «автор – текст – читатель» [13]. В этом случае читатель понимает и интерпретирует авторские смыслы текста, заложенные в

концептуально-содержательной информации (основной авторский смысл), содержательно-фактуальной информации (поверхностный смысл), в подтекстовой информации (подтекстовый смысл)

Таким образом, для повышения активизации мотивации, направленной на пробуждение читательского интереса к чтению литературы, следует определить понятие «мотивация», рассмотреть его виды, использовать приемы и методы, такие, как: 1) метод проблемного усвоения нового знания читателем; 2) использование метода применения стратегий (а именно, стратегии работы с книгой, включающей в себя предтекстовую, текстовую, послетекстовые стратегии); 3) метод диалога автора и читателя, в процессе которого читатель постигает смыслы текста (основный авторский, передаваемый путем концептуально-содержательной информации), подтекстовый смысл (выраженный имплицитно и передаваемый при помощи подтекстовой информации), поверхностный смысл (актуализирующийся путем фактуально-содержательной информации).

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FORMATION OF CULTURAL COMPETENCE OF FUTURE TEACHERS IN THE CONDITIONS OF HUMANITARIZATION OF THE EDUCATIONAL ENVIRONMENT

Galiyeva B.,

PhD, Associate Professor of the Department of Theoretical and Applied Linguistics of the Eurasian National University, Astana

Kuntubayeva G.,

Master of Pedagogy, Senior lecturer of the Department of Social and Humanitarian Disciplines of the Kazakh University of Technology and Business, Astana

Nurgazina A.

PhD, Associate Professor of the Department of Theoretical and Applied Linguistics of the Eurasian National University, Astana)

ФОРМИРОВАНИЕ КУЛЬТУРНОЙ КОМПЕТЕНЦИИ БУДУЩИХ УЧИТЕЛЕЙ В УСЛОВИЯХ ГУМАНИТАРИЗАЦИИ ОБРАЗОВАТЕЛЬНОЙ СРЕДЫ

Галиева Б.Х.

к.п.н., доцент кафедры теоретической и прикладной лингвистики Евразийского национального университета, г. Астана

Кунтубаева Г.О.

магистр педагогики, ст. преподаватель кафедры социально-гуманитарных дисциплин Казахского университета технологии и бизнеса, г. Астана

Нургазина А.Б.

к.ф.н., доцент кафедры теоретической и прикладной лингвистики Евразийского национального университета, г. Астана https://doi.org/10.5281/zenodo.7878400

Abstract

The article deals with the actual problem of the formation of future teachers of key professional competencies. Among them, the authors put forward cultural competence as a meaning-forming center. In turn, cultural competence is analyzed through the prism of humanitarization of the educational environment based on the humanitarian paradigm, which focuses on a person in all the diversity of his connections and relationships with the outside world.

Аннотация

В статье рассматривается актуальная проблема формирования у будущих учителей ключевых профессиональных компетенций. Среди них в качестве смыслообразующего центра авторами выдвигается культурная компетенция. В свою очередь, она анализируется через призму гуманитаризации образовательной среды, основанной на гуманитарной парадигме, в центре внимания которой находится человек во всем многообразии его связей и отношений с окружающим миром.

Keywords: cultural competence, humanitarization of the educational environment, values **Ключевые слова**: культурная компетенция, гуманитаризация образовательной среды, ценности

Актуальность проблемы изучения ключевых компетенций обучаемого обусловлена теми преобразованиями, которые совершаются в рамках образовательной системы с целью ее модернизации. Для этого осуществляется гуманитаризация образовательной среды, основанной на гуманитарной парадигме, в центре внимания которой находится человек во всем многообразии его связей и отношений с окружающим миром. «Целью же гуманитарности выступает развитие человеческого качества, того, что составляет истинную человеческую сущность в его соотнесенности с миром ценностей культуры, человеческих отношений»[1, 20].

М.М. Данилова полагает, что гуманитарный подход основан на гуманитарном принципе, предполагающем: а) гуманистическую направленность профессионального развития будущих специалистов; б) обеспечение вариативности и творческого

подхода к отбору содержания ценностей, заложенных в основу профессиональной культуры, выбору методов, средств и форм ее развития; в) субъект-субъектный диалогичный характер отношений преподавателей и студентов; г) единство культурологического и компетентностного подходов к организации развития профессиональной культуры будущих специалистов»[2, 104 – 105].

 ${
m H.\Phi.}$ Радионова поддерживает мысль ${
m M.M.}$ Даниловой о диалогическом характере взаимодействия преподавателя и обучаемого, ибо «педагогический процесс в контексте гуманитарного подхода является субъектным и межличностным, развивающимся взаимодействием его участников, его творцов» [3, 18-19].

Ю.В. Сенько и М.Н. Фроловская считают, что гуманитаризация образовательной среды происхо-

дит «путем внедрения в ее рамки культурологического подхода, благодаря которому и формируется культурно-образовательная среда, где происходят культурные события, превалируют культурные образы жизни, культурные ценности. Гуманитаризация образовательной среды — это приобщение непосредственных участников педагогического процесса к культуре как живому воплощению мира человеческих ценностей и смыслов» [4, 137].

И.А. Колесниковой выдвигается положение о реализации гуманитарного подхода путем усвоения гуманитарных знаний, имеющим такие признаки, как: 1) представляет знания о способах эффективной реализации субъективного деятельностного начала в человеке; 2) источником и предметом гуманитарного знания является субъективный мир самосознания субъекта в его отношениях с реальностью; 3) содержит информацию об особенностях самого познающего субъекта; 4) это ценностноориентированное знание, диалогичное и контекстное» [5, 33 – 34].

Гуманитарное знание характеризуется нами как знание, входящее в состав совокупности знаний-компетенций. Поэтому в материалах Болонского процесса ставится вопрос о ключевой компетенции обучаемых, как «совокупности компетенций, необходимых для соответствия профессиональным требованиям в различных социальных областях и сферах жизни [6, 214].

Ключевая компетенция включает в свой состав не только предметные знания, но и процедурные знания, т.е. знания, характеризуемые как навыки и умения. В образовательных учреждениях уделяется больше внимания овладению предметными знаниями, тогда как за любыми знаниями стоят два набора сведений: 1) рефлексивный слой (здание); 2) способы действий, которые надо знать. В связи с этим В.П. Зинченко утверждает, что в родной культуре за любым знаком стоят два набора сведений: знания и способы действий с предметом[7]. Именно способы действий с предметом и рассматриваются как процедурные знания, реализующие сведения о том, как использовать усвоенные знания, в какой ситуации. Поэтому Ж. Шэпер в составе ключевых профессиональных компетенций выделяет такие компоненты, как: «специфическая, деловая, методическая, социальная, само-компетенция, компетенция в области применения» [8, 257].

На наш взгляд, профессиональные ключевые компетенции включают в себя широкий круг знаний: 1) знания о профессиональной деятельности; 2) знания о предмете профессионального труда; 3) методические знания; 4) культурные знания.

Профессиональная деятельность подразделяется, согласно Е.А. Климову, на пять видов: 1) человек – природа (дает сведения о профессиях, связанных с растительными и животными организмами); 2) человек – техника (характеризует профессии, связанные с техническими объектами труда); 3) человек – знаковая система (рассматривает предметные миры); 4) человек – художественный образ (описывает профессии, занимающиеся

фактами художественного отражения действительности); 5) человек – человек (даёт понятие о профессиях, связанных с представлением о развитии, преобразовании человека) [9].

Педагогическая профессия относится к профессиям, характеризуемым согласно схеме «человек – человек», так как имеет дело с подготовкой учителя. Педагогическая деятельность характеризуется как деятельность, способствующая формированию личности учителя и включает в свою структуру мотив (понимаемый как удовлетворение потребности общества в подготовке педагогов), потребность в социальном взаимодействии педагога и обучаемого, осуществляемого в педагогическом процессе);

Цель педагогического процесса — обучение, воспитание, развитие и формирование склонности к научной деятельности, а также осуществление деятельности(ориентировка, использование психологических орудий (язык как средство коммуникации преподавателя и обучаемого), образа деятельности (научение обучаемого основам педагогической деятельности), способа деятельности (методы и приемы, технологии обучения индивида педагогическим знаниям и умениям).

К предметным профессиональным знаниям педагога относятся: 1) знания об особенностях педагогической деятельности; 2) знания о способах осуществления данной деятельности; 3) знание навыков и умений применения предметных профессиональных знаний; 4) знания о культурных ценностях, необходимых в условиях «культуросообразности» образовательной среды; 5) знания, входящие в структуру методической компетенции.

Культурная компетенция определяется как «способности,свойства личности,обусловливающие и определяющие продуктивность широкого круга социальнойи профессиональной деятельности современного специалиста»[10, 29].В состав культурной компетенции входят прежде всего знания о культурных ценностях, так как культура — это «совокупность знаний,опыта,верования, ценностных установок, отношений,значений, иерархических связей, религии, понятий о времени, пространстве, ролях, концептов Вселенной» [11, 2 — 3]. Все эти компоненты культуры являются культурными стандартами,среди которых, в первую очередь, выделяются ценности. Для будущего педагога значимыми являются такие ценности, как:

- 1. Ценности-знания, имеющие значимость для него и для его будущей профессиональной творческой деятельности. Знание понимается как сумма накопленного индивидом процесса жизнедеятельности социокультурного опыта. Знания приобретаются личностью в процессе осуществления познавательной деятельности.
- 2. Ценность-отношения. Они характеризуются как отношения, возникающие в процессе общения личности с другими (друзьями, со студентами в группе, преподавателем), имеющие значимость для личности в ходе его общения с другими личностями в процессе учёбы, в ходе взаимоотношений с другими людьми во внеаудиторное время.

- 3. Ценность-ориентации, рассматривающиеся как позиции личности, в соответствии с которыми строится поведение индивида. Они представляют субъективное отражение мира в сознании индивида, разделенного им в процессе оценочной категоризации объектов мира на позитивно-оцениваемые или негативно-воспринимаемое.
- 4. Ценность-идеи определяются как идея, значимые для формирования мировоззренческих установок, как система взглядов человека на окружающий мир и свое место в нем.
- 5. Ценность-качества дают представление о качествах личности по характеру совершения им нравственных поступков, по интеллектуальным способностям, по проявляемым им творческим способностям, по качествам, реализуемым в отношениях с другими людьми.
- 6. Ценность-средства рассматриваются как совокупность действий, направленных на решение определенных задач, способствующих получению образования, профессии, благодаря использованию технологий, применяемых в сфере образования; коммуникативных, позволяющих эффективно осуществлять общение, коммуникации, действия, отражающее сущность самой личности[12].

Одним из способов при общении обучаемых к ценностям является создание педагогических условий для организации диалога учащихся с преподавателем в аксиологическом педагогическом пространстве. Такое пространство понимается Л.В. Вершининой как «пространство проживания и учителя, и ученика в педагогической реальности, в которой происходит встреча ученика с ценностями, с ценностными устремлениями учителя, а учителя —с ценностными устремлениями учащихся»[13, 324].

В аксиологическом пространстве педагог оказывается действие ученику в проявлении ценностного отношения к различным видам ценностей, например, предлагает обучаемым осуществить оценочную категоризацию понятий «добро» и«зло» путем соотнесения этих понятий с оценочными«хорошо» и«плохо». Для этого преподаватель приводит пословицы, фразеологизмы. Обучаемые должны распределить их по категориямна «хорошо» и «плохо»:сердце мхом обросло; от чужих пожитков не нажить прибытков; гнаться за добрым рублем;доброму сухарь на пользу, а злому и мясное не впрок; добрые люди; нет худа без добра; корень зла; со зла и др.

Вторым путем приобщения обучаемых к ценностям является метод интериоризации ценностей и последующего их «проживания» в ходе реализации внутренней деятельности личности. В процессе этой деятельности личность индивид осознает ценности, вырабатывает по отношению к ним свои ценностные ориентации (позитивные или негативные), выявляет значимость интериоризированной ценности для себя и отвечает на вопрос: «что означает эта ценность для меня, служит ли она ориентиром моей жизнедеятельности?» Например, интериоризируя ценность «долг», личность выявляет, что понятие «долг» обозначает не только «денежный

долг», но и нравственное совершенство воли, долженствования, ср.: выполнять долг, человек долга и др. В процессе смыслотворческой деятельности возникает личностный смысл ценности «долг», рождающийся вследствие удовлетворения потребности личности в индивидуальном понимании ценности и выявления ее смысла для себя лично. Для выработки личностного смысла личность осуществляет и эмоциональную деятельность, переживая свое «Я», выражая свои чувства и эмоции.

Третий способ приобщения обучаемых к культурным ценностям - метод накопления культурного опыта. Преподавателем в ходе применения этого метода создаются педагогические условия, такие, как вхождение в культурный опыт.Д. Дьюи считал, что для этого следует использовать проблемный метод, позволяющий поставить обучаемых в затруднительное положение. С этой целью создается проблемная ситуация и формируется проблема. Благотворительность бизнесменов это милосердие или попытка уклонения от уплаты налогов? Обучаемые находятся в затруднительном положении: с одной стороны, бизнесмен совершает милосердный поступок, с другой - преследует корыстные цели. Для того, чтобы понять сущность поступка благотворителя, обучаемые добывают новые знания о понятиях «милосердие», «корысть». В результате обсуждения поступка человека, совершающего добро и сострадающего другому, учащиеся понимают, что в современном восприятии (в английской культуре) благотворительность означает «сначала оказать помощь себе, потом остальным». В случае совершения милосердного поступка благотворитель совершает добро. Но каждый добрый поступок возвращается сторицей, поэтому поступок благотворителя, сделанный от чистого сердца, вознаграждается. И это побуждает его и дальше творить добро.

Культурный опыт личности может накапливаться и в процессе усвоения культурных стереотипов нормативного поведения и демонстрации одобряемого поведения. Культурные стереотипы – это нормы поведения человека в социальной ситуации, нормы этические и этнические. Нормы, образцы поведения зафиксированы в традициях, обычаях, обрядах как социальных программах. И эти образцы поведения усваиваются копировально-вербальным путем «делай как я» в ходе накопления опыта, в ходе реализации определенного поведения, так как «Опыт событиен. Он не копилка знаний, неизвестно как перешедших в умения. Опыт постоянные практические и предметные обновления, осмысление и переосмысление личностного прикладного знания, т.е. такого знания, которое принято личностью и включено в практику»[14, 26]. Человек сам может регулировать свое поведение, усваивая образцы поведения, заключенные в культурных стереотипах, а также в пословицах, поговорках, фразеологизмах, пытаясь «сохранить его, сделать этот опыт ориентиром будущей деятельности и образцом поведения» [15], ср., в табл. №1.

Таблица 1.

Образцы поведения

образды поведения					
Образцовое поведение	Необразцовое поведение				
сказал — как топором отрубил (сдержит данное слово);	без дела жить – только небо коптить (лодырь);				
береги землю родимую, как мать родимую (патриотизм);	белые ручки чужие труды любят;				
кто обучился хорошо, у того золотые руки (мастер);	без присмотра хозяйство гибнет;				
береги денежку на чёрный день;	без стыда лица не износишь;				
спеси боятся, а вежливость чтут;	Богатство – спеси родня;				
Гостю – почёт, хозяину – честь;	в долгу как в шелку; гулянки да пирушки оставят без по- лушки				
не званый да желанный;	с умом жить – тешиться, а без ума – мучиться;				
грамота правдой сильна	не тот грамотен, кто слушать умеет, а тот, кто слушает да разумеет;				

Таким образом, анализ методов формирования культурных компетенций будущих педагогов как профессиональных показывает, что при общении обучаемых к ценностям осуществляется различными способами: диалог преподавателя с обучаемым в аксиологическом педагогическом пространстве и проживание ими ценностей, оценочная категоризация ценностей, метод интериоризации с целью выработки личностного смысла, метод накопления культурного опыта.

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PROJECT TECHNOLOGIES IN SCHOOLS OF RUSSIA AND THE USA

Voskresenskaia L.F.,

candidat of science, associated professor, teacher in Slipchenko Volgograd Cadet School.

Muldagaliev K.

student in Slipchenko Volgograd Cadet School

ПРОЕКТНЫЕ ТЕХНОЛОГИИ В ШКОЛАХ РОССИИ И США

Воскресенская Л.Ф.

кандидат педагогических наук, доцент, учитель Волгоградского кадетского корпуса имени Ф.Ф. Слипченко

Мулдагалиев К.

кадет Волгоградского кадетского корпуса имени Φ . Ф. Слипченко https://doi.org/10.5281/zenodo.7878406

Abstract

The article considers specific features of students' projects in schools of Russia and the USA. Project technologies are analyzed and compared.

Аннотация

В статье рассмотрены особенности организации учебных проектов в школах России и США. Проведен сравнительный анализ применяемых проектных технологий в этих странах.

Keywords: project technologies, project based learning.

Ключевые слова: проектные технологии, проектно-ориентированное обучение.

В настоящее время проектные технологии являются наиболее востребованными образовательными технологиями во всем мире. Их широкое применение обусловлено тем, что они наиболее эффективно развивают умения самостоятельной познавательной деятельности ученика. Выполнение проекта мотивирует к поиску оптимального способа решения проблемы, формирует как навыки критического мышления, так и творческий потенциал подростка.

Что является проектом? На этот простой вопрос оказывается довольно сложно ответить, поскольку в школьной образовательной практике проектом называют и поделку на уроке технологии, и обобщающее задание по изученной теме, и учебное исследование по определенной проблеме. Это неслучайно, поскольку само понимание проектного обучения крайне расплывчато. Так, в справочнике Автор24 дается следующее определение: «Технология проектного обучения - один из способов организации эффективного образовательного процесса, основанного на личностной ориентации и направленного на формирование у учащихся таких качеств как самостоятельность, инициативность и способности к творчеству. Основной целью технологии проектного обучения является создание эффективных условий обучения» [4]. Таким образом, любое учебное задание, которое развивает самостоятельность, инициативу и творческий потенциал ребенка можно назвать проектом.

Известно, что возникновение проектной технологии как метода обучения связано с именами американских ученых Дж. Дьюи, У. Килпатрика, Д.

Снедзена. Зародившись в начале XX столетия, проектная парадигма в образовании триумфально прошествовала в педагогические системы разных стран. Проектное обучение в России связано с именами: П.П. Блонского, А.С. Макаренко, С.Т. Шацкого. В каждой стране проектные технологии развивались своим путем. Так, в 1931 г. Постановлением ЦК ВКП(б) метод проектов был осужден в нашей стране как чуждый советской школе и официально не признавался вплоть до конца 80-х годов. Однако, следует подчеркнуть, что проектные формы работы присутствовали в работе с детьми. В основном их широко применяли в деятельности массовых молодежных организаций пионеров и комсомольцев, не употребляя термин проектная технология. Не случайно проектные формы работы через 100 лет после их зарождения имеют свои национальные отличия. Изучение особенностей организации проектной деятельности учащихся позволило провести сравнительный анализ применения проектных технологий в школьной образовательной системе США и России.

В качестве материала для анализа проектной деятельности использовался опыт работы Волгоградского кадетского корпуса Следственного комитета Российской Федерации имени Ф.Ф. Слипченко, который является местом работы и учебы авторов данной статьи.

В качестве примеров разнообразных проектов, проводимых в нашем кадетском корпусе можно привести проекты, выполненные в рамках учебного предмета индивидуальный проект. Так, в 11 классе Данила М. выполнил исследовательский проект на

тему «Экологическая логистика. Перспектива развития электромобиля в России на примере Волгограда». Его работу можно классифицировать как

- 1) по содержанию межпредметный,
- 2) по основному методу исследовательский,
- 3) по характеру координирования со стороны педагога со скрытой координацией,
 - 4) по продолжительности долгосрочный,
- 5) по количеству участников индивидуальный.

В проекте автор определил преимущества и перспективу развития электромобилей, предположил их будущее развитие в нашем городе.

В этом же классе Егор К. и Павел Л. выполнили исследовательский проект на тему «Буллинг в общеобразовательных организациях, как социально-психологическое явление». Их проект можно определить как

- 1) по содержанию надпредметный,
- 2) по основному методу исследовательский,
- 3) по характеру координирования с явной координацией,
 - 4) по продолжительности долгосрочный,
 - 5) по количеству участников групповой.

В своей работе кадеты изучили буллинг, провели анкетирование и выявили возможные сферы проявления буллинга в школе.

В кадетском корпусе осуществляются различные проекты. Так, в текущем учебном году методическое объединение учителей английского языка организовали проект, посвященный знаменитому английскому писателю Дж. Свифту. В ходе подготовки проекта, в котором приняли участие кадеты 8 и 10 классов, ребята изучили биографию писателя, особенности языка его произведений, а также содержание полной версии «Путешествий Гулливера». Вся собранная информация была представлена в ходе заключительного мероприятия, которое носило характер творческой презентации, викторины и драматизации. Таким образом, данный проект можно рассматривать как

- 1) надпредметный,
- 2) игровой,
- 3) с явной координацией,
- 4) долгосрочный,
- 5) коллективный.

Знакомство с опытом применения проектных технологий в американских школах проходило на основе участия автора статьи в совместном проекте «Партнерство в образовании», спонсированном правительством США в 1999 году и изучения материалов сайта института образования Бак (Buck Institute for Education) под названием PBL Works (Мастерская проектно-ориентированного образования) [3].

В современной американской школе также широко используются проекты в качестве образовательной технологии. Однако, школьные педагоги разграничивают так называемые «проекты на десерт» («dessert project») и проектное обучение (Project Based Learning). [3] Если первые являются способом обобщения изученной темы или учебного модуля, то проектное обучение представляет собой

способ овладения учебной программой. Таким образом, проект в системе проектного обучения (ПБЛ) представляет собой полноценный модуль учебного плана от начала до итогового представления проекта.

В противоположность проектам, выполняемым как часть учебного модуля, проект в системе проектного обучения занимает по времени весь период, отведенный для прохождения данной учебной темы (модуля, раздела). ПБЛ развивает критическое мышление, умение разрешать проблемные ситуации, а также умение общаться и сотрудничать в процессе выполнения работы. Для того, чтобы отвечать на наводящие вопросы и создавать продукт высокого качества, учащиеся должны делать гораздо больше, чем запоминать информацию: они должны использовать навыки мышления более высокого порядка и научиться работать в команде. Подобный подход в образовании современные американские педагоги рассматривают не только как педагогический прием, но и как основу для приобретения навыков непрерывного обучения или обучения в течение всей жизни (life-long learning), которые позволяют молодому человеку адаптироваться к постоянным изменениям на глобальном рынке труда, в технологиях, требованиях к учебе и работе.

Ещё одной важной характеристикой проектного обучения является направленность проектной деятельности на решение реальной проблемы того, социума, в котором живут ученики и находится их школа. Результаты проекта выносятся на обсуждение за пределами школы и не ограничивается информацией в учебном кабинете. Таким образом, по мнению разработчиков данной парадигмы обучения, ученики становятся более вовлеченными в свою работу. Они понимают, как материал, который они изучают в школе, применим к реальному миру. Они развивают навыки, помогающие им добиться успеха на этапе дальнейшего образования, в своей карьере и в жизни.

Группа педагогов, именуемая Институт образования Бак (Buck Institute for Education), специализирующийся на проектном подходе в образовании, разработала ряд стандартов для осуществления высоко качественного проектного обучения (The gold standard for high-quality PBL)[3], которое гарантирует учащимся овладение основным содержанием определенной темы/модуля образовательной программы в процессе коллективной исследовательской работы. Таким образом, проекты направлены на приобретение учащимися основных знаний, понятий и умений.

Разработанный Золотой стандарт проектного обучения заключает в себе две основные линии, которым необходимо следовать педагогам, работающим в данном формате.

- 1. Структурные элементы, обеспечивающие создание основной схемы планируемого проекта.
- Образовательные технологии, помогающие педагогам сверять, улучшать и оценивать свою работу.

Основными структурными элементами проектного обучения в проекте, организованном в формате ПБЛ являются:

- Реальная актуальная проблема
- Постоянная исследовательская деятельность
- Заинтересованность учащихся в решении проблемы
- Постоянное обсуждение хода работы и своих достижений
 - Рефлексия
- Критика со стороны (обмен информацией о ходе работы с другими группами)
- Публичное представление результатов работы за пределами школы

Образовательные технологии включают в себя:

• Разработка проекта в соответствии с темой учебного раздела/модуля

- Адаптация проекта к образовательным стандартам
- Поощрение учащихся за стремление к собственному независимому исследованию, поддержанию командного духа и вниманию к качеству выполняемой работы
- Структурирование всей деятельности от начала проекта до презентации полученного продукта
 - Обучение учащихся приемам деятельности
- Использование промежуточного и итогового оценивания достижений учащихся
- Саморазвитие педагога, включая его повышение квалификации

Таким образом, проектно-ориентированное обучение отличается от проектных технологий в следующих принципиальных аспектах:

Проектная технология	Проектно-ориентированное обучение
Задания направлены на освоение дополнительного	Задания направлены на освоение основного учеб-
материала	ного материала
Осуществляется в качестве обобщения изученного	Осуществляется в процессе изучения основного
материала	учебного материала
Целью является выполнение специфического зада-	Целью является разрешение комплексной реально
Р В В В В В В В В В В В В В В В В В В В	существующей проблемы
Работа выполняется индивидуально	Работа выполняется в группе
Презентация результата происходит в классе (в	Презентация результата происходит вне школы в
школе)	присутствии заинтересованных лиц

В качестве примера проектной технологии можно привести День первых поселенцев, который организуется в 11-х классах одной из старших школ города Альбукьерки, штат Нью-Мексико, США. После изучения темы образования первых поселений выходцев из Европы на территории северной Америки в школе проводится праздник, в котором принимают участие ученики, учителя и родители. Совместно они показывают и представляют различные ремесла, характерные для того времени, показывают инсценировку общественных собраний. Девушки демонстрируют умение в коллективной забаве - оплетение майского шеста, а родители помогают приготовить еду, которая была распространена в то время. Все участники праздника приходят в школу в платьях образца 17-18 века. Проведение подобного праздника занимает весь учебный день. В ходе его подготовки и проведения учащиеся не только приобретают знания, но также получают практические навыки и богатый эмоциональный опыт переживания того, что они изучали на уроках истории.

В парадигме проектно-ориентированного обучения целью является не получение знаний по определенной теме, а создание социально значимого продукта. Так, в 6 классе одной из средних школ го-

рода Нэшвилл, штат Теннесси, США, учитель организовал изучение темы «Движение за гражданские права в Нэшвилле» через создание виртуального музея «Марш через Нэшвилл». Группы учеников выполняли различные задания, посещали музей города, знакомились с литературой, оценивали собранный материал с точки зрения его необходимости в содержании виртуального музея. Изучение темы завершилось представлением готовых презентаций, которые оценивали приглашенные сотрудники городского музея и городской мэрии. Таким образом, всё изучение темы было организовано как работа по выполнению проекта. Ученики приобрели не только знания фактического исторического материала, но и опыт коллективной работы по созданию необходимого социального продукта.

Сравнение парадигм организации проектной деятельности учащихся общеобразовательных школ нами проведено по следующим критериям:

- 1. включенность проектной деятельности в освоение учебной программы по определенному предмету;
 - 2. определение цели проекта;
- 3. степень сотрудничества учащихся в ходе выполнения проекта;
- 4. вовлеченность в выполнение проекта сторонних лиц.

Габлица

Сравнение парадигм организации проектной деятельности учащихся

Критерий	Школы России	Школы США	
Цель проекта	Приобретение навы- ков исследователь- ской работы	Создание продукта. Приобретение опыта командной работы	
Включенность проектной деятельности в освоение учебной программы по предмету	Приобретение дополнительных знаний	Приобретение дополнительных знаний. В парадигме ПБЛ – способ овладения учебной программой	
Степень сотрудничества учащихся в ходе выполнения проекта	Преимущественно индивидуальная работа	Преимущественно командная работа	
Вовлеченность в выполнение проекта сторонних лиц	Не предполагается	Предполагает вовлечение родителей, представителей научных, общественных и административных кругов	

Данные таблицы 1 отражают массовую практику, наиболее характерную для повседневной работы общеобразовательных учреждений. Несомненно, возможны отдельные примеры, не соответствующие приведенным характеристикам.

Таким образом, в качестве положительной характеристики проектной деятельности в российских школах можно отметить их ориентированность на развитие самостоятельных исследовательских качеств подростка, развитие его критического мышления. Проектная деятельность способствует его самоопределению в сфере выбора будущей профессиональной области и развитие профессиональных интересов.

Проектная деятельность американских школьников способствует формированию навыков командной работы, формирует эмоциональный опыт в ходе выполнения учебных задач. Социальная открытость и актуальность школьных проектов способствует развитию общественных качеств личности. Эту особенность можно отметить как положительную характеристику, которую следует учитывать и при организации проектной деятельности в российских школах.

Отдельные примеры общественной ориентированности проектной деятельности присутствуют и в нашем кадетском корпусе. Так, например, учитель истории А.С. К. в 2017 - 2018 годах организовал и проводил долгосрочный социально-исторический проект «Сталинград в моем сердце», посвященный 75-летию Сталинградской битвы. А под руководством учителя истории Е.И.Ф. кадеты осуществляют проект по восстановлению исторической справедливости в отношении участника Сталинградской битвы снайпера А.И. Фролова. Участники этих проектов смогли вовлечь в их реализацию своих родителей, а также общественные и административные органы нашего региона. Результаты проектов получили широкую общественную огласку и одобрение, а участники проектов приобрели богатый опыт социально-исторической деятельности. Эти примеры могут быть изучены и применены в организации проектов в других предметных областях.

Таким образом, проведенное исследование позволило нам сравнить формы организации проектной деятельности школьников США и России и выявить наиболее выраженную общественную направленность и открытость социальной проблематике проектов в американской школе. Данный вывод может служить ориентиром в разработке подходов планирования проектной деятельности в российских школах с учетом предстоящих изменений в программе учебного предмета индивидуальный проект в соответствии с обновленными ФГОС среднего общего образования [1].

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PHILOLOGICAL SCIENCES

SOME PECULIARITIES OF METAPHOR AND METAPHORICAL HYPERBOLE IN THE NOVEL "THE GREAT GATSBY" BY FRANCIS SCOTT FITZGERALD

Podavets O., Gerok-Yerzhanova O.

Kostanay State Pedagogical Institute after U. Sultangazin
Tauelsizdik Street, 117
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Abstract

Figurative and expressive means of language are techniques that make it intuitive, imaginative and decorate evaluation and perception in a special way, attracting attention. Stylistic technique is an important tool in the process of creating a visual image of the character of the work. With the help of stylistic devices, the characters are characterized by recreating a living image.

Keywords: metaphor, hyperbole, metaphorical personification, irony, metaphorical simile

Nowadays the requirements of knowing language are growing and the necessity of reading literature is becoming natural for these learners who really want to know English well for communication with the native speakers. The authors made up their minds to consider the use of some lexical stylistic devices such as metaphors and metaphorical hyperbole in the novel "The Great Gatsby" by Francis Scott Fitzgerald.

The Great Gatsby is a novel by American writer Francis Scott Fitzgerald, which was published in 1925, and this novel is a classic representative of the so-called "Jazz Age" in American literature. The matter is that this novel is saturated with a great number of variety ways of descriptions. Let's consider the following sentence!

My own house was an eye-sore, but it was a small eye-sore.

There is a metaphor "My own house was an eyesore" in this abstract.

The character Nick Carraway in his speech compares the size of his house and the Gatsby Palace. Thus, one house is presented as a huge and magnificent mansion, and the other as a tiny inconspicuous house.

I enjoyed the counter-raid so thoroughly that I came back restless. [3, c. 10]

These words demonstrate a certain irritation, a sarcastic tone.

The lawn started at the beach and ran toward the front door for a quarter of a mile, jumping over sundials and brick walks and burning gardens—finally when it reached the house drifting up the side in bright vines as though from the momentum of its run.

"Burning gardens" means a lot of colors, bright attention-grabbing gardens.

I've been lying on that sofa for as long as I can remember.

Overstatement hyperbole highlights Daisy's despondency, a prolonged pause in her life.

Tom's getting very profound. He reads deep books with long words in them. We've got to beat them down.

A perfect example of verbal irony is shown. Daisy makes fun of Tom in a caustic manner. It is clear that

she does not support his judgments, however, judging by Tom's irritation, she expresses it in a slightly venomously, sarcastic form.

That's why I came over tonight. [3, c. 38]

Nick Carraway jokes while answering Daisy, who asked if he wanted to know the truth about the butler's nose. That is, he says what he doesn't really mean, therefore it is verbal irony.

Her family is one aunt about a thousand years old. [3, p. 52]

Trite hyperbole shows overstatement implying that the aunt is very old.

On Sunday morning while church bells rang in the villages along shore the world and its mistress returned to Gatsby's house and twinkled hilariously on his lawn. [3, c. 148]

On such a morning there were so many people that it is compared to the whole world, they "twinkled hilariously", which means that they brought gloss, fun and chic to the Gatsby house.

It was a rich cream color, bright with nickel, swollen here and there in its monstrous length with triumphant hatboxes and supper-boxes and tool-boxes, and terraced with a labyrinth of windshields that mirrored a dozen suns.

In the description of Gatsby's car, the hyperbole "monstrous length" is used, which means an incredible capable of striking the imagination length, and "dozen suns" expression probably resulted from a multitude of reflections formed by "labyrinth of windshields".

With fenders spread like wings we scattered light through half Astoria. [3, c. 168]

When it comes to driving speed, the inversion consisting of hyperbole gives the reader to understand how Nick imagined what they looked like from the observer angle. The car seemed to have wings, it seemed to fly, and obviously it was clean, well-groomed, shiny, therefore the text says "we scattered light".

She dressed in white, and had a little white roadster and all day long the telephone rang in her house. [3, c. 184]

Of course, the phone cannot ring every second all day, it is implied that Daisy was popular and charming, enjoyed success in society.

He had become simply the proprietor of an elaborate roadhouse next door. [3, c. 158]

Such a seemingly ordinary comparison shows how much Nick got used to Gatsby, that neither his charm nor charisma overshadowed his personality anymore, he became a simple person for Nick, with whom there was nothing to talk about.

In the first half of the novel, a lot of space is devoted to the description of parties at Gatsby's house:

At high tide in the afternoon I watched his guests diving from the tower of his raft, or taking the sun on the hot sand of his beach while his two motorboats slit the waters of the Sound, drawing aquaplanes over cataracts of foam.

This description includes a metaphor expressed in the predicate "split the waters", and there is an almost complete identification of the concepts: cutting and rapid movement.

It is in the light of irony that the whole external aspect of Gatsby's life at the villa in West Egg is described. Among his numerous, smartly dressed guests, there is not a single memorable face. Their faces are like comic masks, merge and repeat, which exist insofar as the "Great" Gatsby exists, and after his death at the end of the novel disappear without a trace.

At intervals she appeared suddenly at his side like an angry diamond, and hissed: "You promised!" into his ear [3, c. 130]

Describing the voice of an angry wife with whistling-hissing sounds, that is, an implied metaphor, the author enhances the image by comparing it with a diamond cutting glass.

On buffet tables, garnished with glistening hors d'oeuvre, spiced baked hams crowded against salads of harlequin designs and pastry pigs and turkeys bewitched to a dark gold.

The famous celebrations at Gatsby's house stand out here, and the metaphors that occur, help to represent the author's attitude to the hero, and it still remains disapproving. Not only the festivities themselves are disapproved of, but also their host; irony can be traced.

The lights grow brighter as the earth lurches away from the sun and now the orchestra is playing yellow cocktail music and the opera of voices pitches a key higher. Laughter is easier minute by minute, spilled with prodigality, tipped out at a cheerful world.

The metaphorical personification "the earth lurches away" gives an idea of the duration of what is happening, introduces the reader to the atmosphere of the party. That is, the party continues even when it's dark.

In the second sentence, the metaphor "spilled with prodigality, tipped out at a cheerful world" emphasizes the lightness, carefree atmosphere of the evening, as well as the author's ironic, half-contemptuous attitude towards people spending time here, including the host of this evening.

He came alive to me, delivered suddenly from the womb of his purposeless splendor.

These are Nick's thoughts about Gatsby when he found out about his feelings for Daisy, his sadness and his dream. That is, Gatsby acquired some kind of integrity for Nick and a reason to be called a living person.

In the following example, there is already a slight shift in the application and formation of the metaphor:

The groups change more swiftly, swell with new arrivals, dissolve and form in the same breath: already there are wanderers, confident girls who weave here and there among the stouter and more stable, become for a sharp joyous moment the centre of a group, and then, excited with triumpth, glide on through the seachange of faces and voices and colour under the constantly changing light.

Now the metaphor reflects the still cautious, ironic and slightly contemptuous attitude of the author. The first metaphor "swell" is developed and concretized by the subsequent verb "dissolve", "excited with triumpth, glide on through the sea-change".

In the metaphor "the sea-change of faces and voices and colour" the sea does not mean a body of water. Such a structure identifies the multitude, this is an ironic assessment by the author of the society gathered at Gatsby's house.

I went over to his lawn a little after seven and wandered around rather ill-at-ease among swirls and eddies of people I didn't know... [3, c. 102]

It is also used the identification of the set, which is expressed by nouns denoting a complex, intricate connection, the interweaving of an indeterminately large number of subjects.

In the second half of the novel, when the secret of Gatsby is partially revealed – his love for Daisy, the mood of the novel as a whole change, a change in the author's attitude towards his hero is felt, sympathy appears.

...decking it (his dream) out with every bright feather that drifted his way [3, c. 234]

Using the stylistic device of the metaphor "decking out", it is emphasized that Gatsby's dream was becoming more and more attractive.

He literally glowed; without a word or a gesture of exultation a new well-being radiated from him and filled the little room. [3, c. 218]

The metaphor "glowed" reveals its full meaning with the help of the subsequent metaphor "a new wellbeing radiated, filled", which indicates that he is glad to meet Daisy.

When he realized what I was talking about, that there were twinkle-bells of sunshine in the room, he smiled like a weather man, like an ecstatic patron of recurrent light. [3, c. 218]

Metaphorical simile, expressed by the saying "weather man", conveys the joy of the hero, his elated state.

It was strange to reach the marble steps and find no stir of bright dresses in and out of the door, and hear no sound but bird voices in the trees. [3, c. 222]

Another description of the set shows the author's previous attitude to the guests, the noisy crowd, for him they are only "bright dresses in and out of the door".

The sparkling odor of jonquils and the frothy odor of hawthorn and plum blossoms and the pale gold odor of kiss-me-at-the-gate. [3, c. 222]

With the help of participles, the aroma, condition, color and shape of the flowers themselves (narcissus, hawthorn, plum and honeysuckle) are transmitted.

In the last chapters, a tension is added to the approving-sympathetic attitude in anticipation of a tragic denouement.

But with every word she was drawing further and further into herself, so he gave that up, and only the dead dream fought on as the afternoon slipped away, trying to touch what was no longer tangible, struggling unhappily, undespairingly, towards that lost voice across the room [3, c. 330]

The expression "the dead dream fought on" is an ordinary transfer of meaning from one phenomenon to another. The verbs "drawing further, fought on, slipped away, trying to touch what was no longer tangible, struggling" give the whole sentence not only an evaluative coloring of sympathy and sympathy, but also hopelessness, gloomy foreboding. The same can be observed in the following metaphors:

He was clutching at some last hope and I couldn't bear to shake him free 'Jay Gatsby' had broken up like glass against Tom's hard malice. [3, c. 360]

Gatsby broke like glass, so he is depressed and in some kind of despair.

The ending of the novel is replete with metaphors expressing the collapse of hopes and dreams, all the drama and a sense of empathy for the hero is conveyed, and his isolation from the circle of famous and rich is felt more than in other chapters of the novel:

The track curved and now it was going away from the sun, which, as it sank lower, seemed to spread itself in benediction over the vanishing city where she had drown her breath. He stretched out his hand desperately as if to snatch only a wisp of air, to save a fragment of the spot. [3, c. 374]

In the first sentence, the part "sank lower, to spread itself in benediction" reflects the state of the environment, nature, the reader's introduction to the mood of the hero, his despair and the loss of the meaning of life.

Want to go with me, old sport? [3, c. 118]

Here it is possible to note a little joking, even ironic attitude of the speaker to his interlocutor.

The grass looks fine, if that's you mean. [3, c. 204] The speaker wants to please his interlocutor, to inform him that the lawn around the mansion looks decent or even beautiful, or he likes the freshness and greenery of the grass, which the gardener so carefully monitors.

I hate careless people. That's why I like you. [3, c. 148]

The use of this verb "like" serves to describe the scene of the woman's confession that she really likes this young man, that maybe she is even in love with him.

Figurative and expressive means of language are techniques that make it intuitive, imaginative and decorate evaluation and perception in a special way, attracting attention. Stylistic technique is an important tool in the process of creating a visual image of the character of the work. With the help of stylistic devices, the characters are characterized by recreating a living image.

The frequently encountered contrasts reveal the inner inconsistency of Gatsby, the discrepancy between his thoughts about succeeding to win an imposed dream and his true motives, eternal moral values are clearly visible.

Most stylistic devices affect the emotional and expressive coloring of the word. Different meanings of the same words can differ markedly in stylistic coloring, in one sense the word appears as majestic, high, and in another - as ironic, mocking. Metaphorization also contributes to the development of expressive nuances in the semantics of words. Thus, stylistically neutral words with the help of metaphorization and hyperbolization acquire a vivid expression. A word exposed to a stylistic device can convey positive and negative emotions, contain an assessment, can be used to convey the author's attitude, irony, etc. The metaphor in the novel focuses on the absurdity of what is happening, the actions of the guests, how everything looks caricatured from the outside: these iridescent bright dresses, people intoxicated with glamour and brilliance, lights burning even brighter at sundown. Metaphors in the novel help to create vivid, memorable images. A metaphor serves to emphasize a feature, create an individual image, create an emotional effect, create a special sentiment.

The accentuation in the text is due to hyperbole. How majestic is Jay Gatsby's palace, how fast is his shining car that seems to fly on wings, or how long has Daisy been in sadness.

It is also obvious that the novel is saturated with irony. Remarkable descriptions convey this gloss and all the external beauty of the surroundings, of the jazz era itself. The behavior and reactions of the characters, especially the guests, how much they are mired in this race for imaginary greatness and prosperity, are ironic. Irony is identified with contempt for such a way of life. Irony, as a means of comic presentation of material, is a powerful tool for the formation of a literary style built on the opposition of the literal meaning of words and utterances to their true meaning.

Thus, based on the analysis carried out, it can be concluded that a distinctive feature of a work of art is a figurative and emotional impact on the reader, expressiveness, achieved by using a huge number of different stylistic techniques. An artistic text, being a fiction (although reflecting reality), provides particularly ample opportunities for freely depicting the passage of time and thus creating various stylistic effects. It is stylistic devices that are carriers of an expressive, bright valuable component of any work. Stylistic devices are an integral part of works of fiction.

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SPECIFIC CHARACTERISTICS OF DEPENDENT PREPOSITIONS IN THE ENGLISH LANGUAGE

Gerok-Yerzhanova O., Podavets O.

senior teachers Kostanay State Pedagogical Institute after U. Sultangazin Tauelsizdik Street, 117 https://doi.org/10.5281/zenodo.7878431

Abstract

This article touches upon the relevant issue in the learning process. The aspect of dependent prepositions in the English language requires special attention in terms of their meaning in the context. The attempt is made to define the major characteristics of dependent prepositions taking into consideration figurative meaning and its classification.

Keywords: metaphor; metonymy; subjectification; derived; compound; composite

To use English effectively, it is important to master four language skills, namely listening, speaking, reading and writing. Of all the four language skills, writing is considered the most difficult process. The majority of students encounter difficulties in using prepositions in terms of semantic aspects. As for the dependent prepositions, they affect the meaning of the words with which they are associated, often changing their meaning beyond recognition. Dependent prepositions have a function in the construction of a sentence. The origin of this type of speech comes from the roots of words of ancient origin.

All English prepositions can be divided into simple, compound, derived and composite. The simple type has an overwhelming number of prepositions. These include, for example, against (with, on, to, under), the prepositions in (for, on, at), about. Compound consists of several components. These include where upon (after which, as a result of which), within (in, inside). Derived ones come from words of other parts of speech. These include, for example, concerning (about, by).

Composite type uses phrases when forming. They consist of a word from another part of speech and one or two prepositions. These include, for example, because of (due to, because of), with regard to (in relation to). Any element from a compound preposition cannot

be shortened or expanded – it is a single whole unit. The meaning of *composite* is directly dependent on the significant word that is part of it. Mainly the composite prepositions can be referred to dependent ones as they acquire the specific characteristics in the context. Some linguists call them prepositions with the metaphorical meaning [1]. The only way to distinguish between the primary and abstract meaning is to memorise prepositions, which is a challenge for students to rise to. A pedagogical strategy is essential for students to pay attention to the cooccurrence, collocation, and discourse behaviour of prepositions.

The group of researchers classifies dependent prepositions according to their structural characteristics. By prepositional use, they mean collocations, patterns and idioms containing prepositions: a) preposition + noun: at risk, on time, out of tune b) noun + preposition: overview of, absorption of, an increase in, lack of c) adjective + preposition: associated with, responsible for, interested in d) verb + preposition: worry about, suffer from, get rid of, die out e) chunk containing preposition: on my own, in the long run, in contact with, on the verge of, to the point of f) idiom containing phrasal verb: clear up your act, hang out, turn down [2].

To demonstrate the semantic shift in meaning, the following examples are given:

- 1. As most young candidates for the pains and penalties of whaling stop at this same New Bedford, thence **to embark on** their voyage, it may as well be related that I, for one, had no idea of so doing. Chapter 2, p. 31 [3]
- 2. I told him that I never liked to sleep two in a bed; that if I should ever do so, it would **depend upon** who the harpooner might be, ... Chapter 3, p. 39 [3]
- 3. Again, I always go to sea as a sailor, because they make a **point of** paying me for my trouble, whereas they never pay passengers a single penny that I ever heard of. Chapter 1, p. 28 [3]
- 4. I pay this particular compliment to Queequeg, because he **treated me with** so much civility and consideration, ... Chapter 4, p. 57 [3]
- 5. He now took off his hat a new beaver hat when I came nigh singing out with fresh surprise. Chapter 3, p. 49 [3]
- 6. Thinks I, Queequeg, **under the circumstances**, this is a very civilized overture; ... Chapter 4, p. 57 [3]

Beitel, D. A., Raymond W. et al. present the classification of dependent prepositions according to the semantic changes. Thus, they identify the following pattern of semantic extension: *metaphor*, *metonymy*, and *subject*. Emphasizing the figurative meaning, they claim that figurative use is not arbitrary, though image schemata embodied through metonymic extension undefined incompatible these image schemata in various conceptual domains [4]. These are prepositions with metaphorical meanings - as a phrase with a verb, noun or adjective. It is dependent prepositions that cannot be replaced by other prepositions, since they are used to connect words in sentences or in certain phrases. Thus, the use of two prepositions is much more determined by the choice of adjacent words.

As far as metonymy is concerned, it occurs conceptually. The most frequent metonymic changes attested in the semantic changes of English prepositions involve conceptual continuity expressible as POSITION > DIRECTION > MOTION, whereby any of these concepts is part of a series of related concepts [5].

The concept of subjectification has been widely used to describe the phenomenon of grammatical shift.

This is an argumentative issue so far, whereas some linguists assume that there are human tendencies such as anthropocentrism and egocentricity that are involved in subjectification [6].

Taking into consideration the semantic domains of dependent prepositions and compiling the material of several investigations, we suggest the following classification of dependent prepositions with the focus on their semantic characteristics:

- 1. Metaphor (spatial *under control*; temporal; grammatical/logical *with surprise*)
 - 2. Polysemy
 - 3. Prototype (diachronically altered meaning)
- 4. Metonymy (contiguity in social physical or cultural experience; contiguity in the utterance; synecdoche) or (position direction motion)
- 5. Subjectification (emphasizing the speaker's attitude in a context)
- 6. Frame-of-Focus Variation (the aspect of space with the shift of focus)
 - 7. Generalization

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EFFICIENT STRATEGIES FOR LEARNING A FOREIGN LANGUAGE THROUGH COMPREHENSION IN LISTENING AND READING

Kostadinov O.D. Ph.D. Nikola Vaptsarov Naval Academy Varna, Bulgaria

ORCID ID: 0000-0002-9183-5243 https://doi.org/10.5281/zenodo.7878449

Abstract

Over the course of their life's experiences and particularly during their real study time, people pick up specific types of information. Learning a language requires more than just aptitude and hard work; it also must be done in a manner that is strictly consistent with human nature. Effective and efficient methods of learning a foreign language (both of which mean "capable of producing a result") are available. When something is effective, it achieves a result even if it requires more needless resources to do it, which is the difference between the two words' meanings. When something is efficient, it not only yields a result but does it quickly, easily, and with the least number of resources (materials, time, effort, etc.).

Keywords: Foreign word memorization; native language; listening, reading, speaking, writing in a foreign language; grammar, lexicology; the language of thought; passive language knowledge; active language knowledge; listening comprehension; reading comprehension; levels of language knowledge; fluency in a foreign language

Research in Support of Modern Foreign Language Learning

1. Introduction

The oldest intellectual ability that men have ever attained is language. The speaker's level of intellectual capacity can be determined by how well they understand it. Though it is theoretically feasible, we find it difficult to envision mind occurring without language. Apart from empirically validated instances of cognition existing independently of language, thought and language are two halves of the same coin. It is well known that a person sees the world through their five senses—the so-called perception systems—which include sight, hearing, smell, taste, and sensation. Humans are capable of perceiving using one or more perceptions in conjunction with other senses. Humans, for instance, understand language by vision and hearing (through reading). Humans can see what oral talks offer.

Since the need to master foreign languages is enormous and the process of learning is long and requires an expenditure of resources, foreign language teachers, as well as publishers of language literature, are in a constant process of improving foreign language education. Achieving this goal goes through the study of the human mind, how foreign language learners perceive and memorize, as well as the mechanism for teaching and efficiently learning new language units.

From a practical standpoint, language is a medium of communication, which means that people communicate with each other through language. Communication between people is the reason for the creation and development of languages. Human minds are the basis of communication between people. The human mind and the need for people to communicate with each other are the reasons for the emergence of language.

The current methodology for learning foreign languages is based on the natural way of learning them. In addition, to speed up the learning process and shorten the time to reach the desired level of proficiency, the methodology includes a scholastic way of teaching, but is highly streamlined.

The natural way to learn a foreign language is by listening to live speech, accompanied by observing the environment and the facial expression of the speaker, i.e., the learners must "immerse themselves in the waters" of the foreign language which they study. It is especially important to note that in the initial stage of learning a foreign language, it is necessary to listen to foreign speech for a long time with a complexity corresponding to the level of the learner's knowledge. Subsequently, when the learner has already created his passive vocabulary of foreign words, in parallel with listening to foreign speech, the learner should go on with reading texts with a complexity corresponding to the level of the learner's knowledge, i.e., listening and reading texts with appropriate difficulty is the basis of natural acquisition of foreign languages. In parallel with listening to a speech and reading a text in the studied foreign language, learners must translate the vocabulary and do grammar exercises, but only of what they have repeatedly heard and memorized at a proper level. Gradual progress in the studied material, with consistent and multiple repetition of what learners have already learned, contributes to the permanent memorization of the learned language units. Learners of a foreign language should repeat what they have learned because each subsequent time of repetition improves the memorization of the language.

❖ **Definition for language**: A system of signs for expression and exchange of human beings' thoughts by four language skills: listening, reading, speaking, and writing. Language gives people the ability to think and to communicate with each other.

2. Human Intelligence, Human Memory, Methodology of Study, and Their Impact on Foreign Language Learning

Human Intelligence, Human Memory, and Methodology of Study are the three key factors for success in the learning of foreign languages.

❖ Definition for Human Intelligence: The ability to think, to learn from experience, to solve problems, and to adapt to new situations is a variable more strongly related to successful educational, occupational, economic, and social outcomes than any other individual differences in human intellectual abilities.

- ❖ **Definition for Human Memory**: *Human memory is the psychological process of acquiring, storing, retaining, and later retrieving information. There are three major processes involved in memory: encoding, storage, and retrieval.*
- ❖ **Definition for Methodology of Study**: The definition of methodology of study is the most efficient way to obtain certain useful knowledge in order for the same to be used in human life.

2.1. Memory as Categories, Phases, and Functions

According to the table below, human memory is characterized in terms of categories, phases, and functions.

Table 1

Model of Human Memory

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Categories, Phases and Functions of Human Memory			
Cotagorias	Explicit memory		
Categories	Implicit memory		
	Sensory memory		
Phases	Short-term memory		
	Long-term memory		
	Transition		
Functions	Repository		
	Retrieve		

For the development of effective educational approaches, it is crucial to comprehend the elements of the human memory model. One of the mental puzzles for which academics still lack a comprehensive solution is memory. The three-part model of memory was created by Richard Atkinson and Richard Shiffrin in 1968. The three primary parts of memory, according to the experts, are sensory memory, short-term memory (sometimes referred to as working memory), and long-term memory. Since then, it has evolved into one of the key theories used to explain how memory functions (Shiffrin et al. 2015). ¹⁰

2.1.1. Categories of memory:

❖ Explicit memory

Explicit memory is when we try to recall something that has already happened, either on our own or with the help of another person. The knowledge we have acquired in the past, such as a remembrance of an experience, is known as explicit memory.

❖ Implicit memory

While explicit memory refers to things that we can consciously recall, implicit memory refers to knowledge that we cannot recall. *Implicit memory refers to the influence of experience on behavior, even if the individual is not aware of those influences*. (Walinga,2010) ¹¹

2.1.2. Phases of Memory

Sensory, short-term, and long-term memory are the three stages of human memory. Since each of these three stages of memory is crucial for human intellect, it is imperative that students understand how human memory is divided. When developing foreign language learning approaches, all three of these phases must be taken into account from the perspective of acquiring a second (foreign) language. ¹²

Phases of Memory: Sensory, Short-Term, and Long-Term Memory

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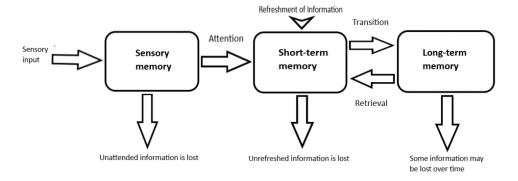


Fig.1: Memory duration¹³

2.1.2.1. Sensory memory: This kind of memory first arises during the brief, up to a few second, as a first stage of memorization. The sensory memory might be visual, aural, gustatory, olfactory, or tactile depending on the person's five senses. **Echoic memory**, a type of auditory sensory memory, and **iconic memory**, a type of visual sensory memory, are both crucial for language development.¹⁴

2.1.2.2. Short-term Memory: This sort of memory lasts only a few seconds to a few minutes and remembers a variety of pictures, words, numbers, facts, etc. The most recent information can quickly replace short-term memory, but it can also be easily replicated. Our short-term memory stores the information that receives our full attention. It is crucial to note that all words learned in a foreign language get into short-term

memory initially when learning the language. The brain retains this knowledge for a very brief period, usually less than a minute, but it cannot stay there permanently. **Working memory** is another name for short-term memory.

❖ Short-term memory has three key aspects.

- Limited capacity: It has limited capacity—it can store about seven items (letters, numbers, words, pictures, names) at a time.
- Limited duration: Storage is very fragile, and the information can be lost with distraction or the passage of time.
- Encoding is primarily acoustic, even translating visual information into sounds. 15

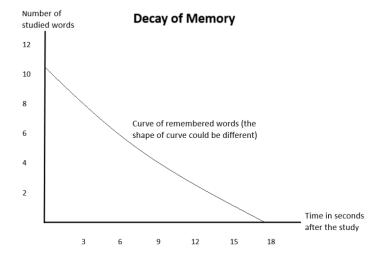


Figure 2: Short-Term Memory Decay

¹³ Source: Introduction to Psychology – 1st Canadian Edition by Jennifer Wal inga, Charles Stango, 2010, p.366

¹⁴ Jennifer Wal inga, Charles Stanger, Introduction to Psychology – 1st Canadian Edition, 2010, p.367

 $^{^{15}}$ McLeod S. A. (2009, December 14). Short-term memory, Simply Psychology. www.simplypsychology.org/short-term-memory.htm

On Fig.2—Decay of Short-term Memory, we can see when we store information in short-term memory and then it will be lost if we do not refresh it properly and enough.

Refreshing information to avoid losing it and then transferring it to long-term memory is one technique to stop knowledge from fading in short-term memory. Repetition of knowledge in the mind with the intention of retaining it in memory is known as maintenance rehearsal. To write it down or maybe store it in long-term memory, we must review the information whenever we want to remember it (such as names, phone numbers, and addresses of specific people).

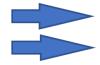
- **2.1.2.3. Long-term Memory**: This type of memory is long-lasting, and the information stored in it can be reproduced after a long period of time, such as years. The recovery of memory may take seconds until all the necessary parts of the brain activate. ¹⁶¹⁷
- ❖ Conclusion 1: In relation to learning a foreign language, we should say that auditory and visual memory are important, as well as other types of sensory memory that humans use to a small extent. The big task

in learning a foreign language is for learners to perceive correctly studied material with their sensory memory, which makes it transfer to their short-term memory. The great difficulty in learning a foreign language is the transition of learned language units from short-term to long-term memory. It is also necessary for the reproduction of the language, which requires the rapid retrieval of the required language knowledge from long-term to short-term memory, also known as working memory. Fluency in a foreign language necessitates the storage of language knowledge in long-term memory.

- ❖ Thesis 1: Human memory has limited capacity and duration. This is a problem that foreign language learners must be aware of and overcome. Foreign Language Learners should pay attention to the fact that human memory is able to receive and keep the latest information in short-term memory in the range of 5−9 items (words), before it goes to long-term memory and only after that can the learners proceed with the study of added information.
- 3. Four types of skills for mastering a foreign language

Four Language Skills

- talk
- write



listen read

The basic skills needed to master any foreign language are **listening**, **reading**, **speaking**, and **writing**. We can divide these four skills into two groups:

- **Listening and reading** to comprehend the concept presented in the foreign language These two skills are necessary to understand the spoken and written language; they are the so-called input skills (**input info**.) ¹⁸
- **Speaking and writing** a foreign language is our ability to present our or another person's thoughts in a foreign language. These two skills are necessary to express ourselves in the spoken and written language; they are the so-called output skills (**output info**.). ¹⁹

The characteristics of four language skills: listening, reading, speaking, and writing, listed in this order, are as follows:

- The degree of learning difficulty affects this ranking. The simplest skills to acquire are listening and understanding. Reading follows, followed by speaking and writing, in that order.
- It seems sense to think that before we can express ourselves in a language, we must first learn to understand it. The opposite is impossible.²⁰

^{4.} Characteristics of the learning process for four languages

¹⁶ Center for non-formal education, https://www.abvgd-so-fia.com/

¹⁷ Article "What are the different types of memory? ", Medical News Today, https://www.medicalnewstoday.com/articles/types-of-memory

¹⁸ Article "The importance of input in the ELT classroom ", Cambridge University Press, https://www.cambridge.org/elt/blog/2017/12/19/the-importance-of-input-in-the-elt-classroom/

¹⁹ Article "Input and output in second language ", My English Pages, https://www.myenglishpages.com/blog/input-and-output-in-second-language-acquisition/

²⁰ Article "The Four Basic Language Skills", Columbia Gorge, Community College, https://www.cgcc.edu/literacy/resources/four-basic-language-skills

The order of abilities required for language acquisition must always be followed when learning a foreign language. The alternative is a time and effort waster.

- ❖ Conclusion 2: The basic conclusion on this point is that output foreign language knowledge always depends on input knowledge because we cannot express anything that we have not learned yet.
- * Thesis 2: The important aspect of foreign language learning is the input process, which secures the necessary knowledge. This process supports the output process, which is necessary for refreshing knowledge. On the other hand, we can assume that during the input process, learners also refresh the knowledge they have already acquired. It is obvious that listening and reading texts at a suitable level are two constant activities, particularly important for maintaining language proficiency.

5. Preparation of the state of mind when learning a foreign language

Foreign language acquisition is a voluntary intellectual activity that necessitates learners' undivided attention and mental focus. The mind gives one the ability to control their activities, although it can be difficult to manage their focus. Since the mind is not "an automatic machine," controlling attention can be done with restraint and the practice of paying close attention when others are speaking. We should also mention the learner's physical health, if he has had enough sleep, and the presence of any emotional problems as other crucial factors for the simple perception and learning of foreign languages. These factors go along with attention and concentration of the mind. The student can construct the ideal learning environment because the aforementioned components are under their control. Together with these

6. Ways to learn a second (foreign) language.

- A second (foreign) language can be learned naturally, through an organized form of learning with teacher participation, or through the traditional (scholastic) method, which involves an organized form of learning.
- Modern methods of learning a second (foreign) language have been developed because of extensive research in the field. According to linguistics, language acquisition is a personal endeavor, and different learners may benefit from various instructional approaches. On the other hand, psychology and human minds are similar. For this reason, science must do more in general to enhance learning foreign languages.

Thesis 3: The author's opinion is that the best is this methodology, which has taken the best of the natural and the best of the traditional (scholastic) ways of learning a second (foreign) language, i.e., both ways of foreign language learning complement each other. In practice, it is best to find a balance between both ways.

This balance is dynamic, and at different acquisition phases (levels), different ratios between the time of natural and scholastic language learning are preferable.

7. Foreign Language Learning by Listening Comprehension and Reading Comprehension

The current approach starts with learning the language through listening comprehension, followed by learning the vocabulary from the text through reading, translation, and learning the appropriate grammatical structures from the text. This approach is appropriate for those learning the language at level A1.²¹

The second main element of the current methodology is "**reading comprehension**"²² and it must be practiced in parallel with the continued learning of the language by "**listening comprehension**"²³, i.e., "listening comprehension" and "reading comprehension" ²⁴, together with the parallel learning of the vocabulary from the text, by reading and learning the corresponding grammatical unit from the text. This methodology is suitable for beginners at language levels A1 and A2.

The third component of the process is the small-step approach to grammar acquisition, although each new grammar unit requires reviewing the prior material. If new and sophisticated forms are required, teachers must introduce them; in other words, grammar must be taught progressively and at various levels. Each grammar level contains the levels that came before it, but always emphasizes the level that is being studied most. This rule is applicable to all levels A1–C1, but students should obviously stress their areas of weakness

The fourth component of the process is striking the right balance between learning new words and learning new grammar rules. Learners strengthen their weak areas of language proficiency in this way.

The fourth component is the ratios of time spent on hearing, reading, speaking, and writing, which are the fundamental abilities required for studying any foreign language, are the methodology's fifth and most important component. The learner can enhance one or more fundamental language skills in this fifth and most significant component of the foreign language learning methodology. For example, if the language is to be used professionally in some types of translation, this would be possible by emphasizing the relevant skills (interpretation from the foreign language; written translation from the foreign language; oral translation into the foreign language.

8. The process of learning unfamiliar words in a foreign language

Any foreign language acquisition process may be broken down into several stages and spans a period. Knowing this procedure will enable learners to select the approach that will help them learn each word most effectively. Memorization fails when foreign words are

²¹ Article "What is Listening Comprehension", All about Learning press, https://blog.allaboutlearningpress.com/listening-comprehension/

²² Article "Improve your students' Reading Comprehension," https://readtheory.org/ (5 July 2022)

²³ Article "What is Listening Comprehension", All about Learning press, https://blog.allaboutlearningpress.com/listening-comprehension

²⁴ Research paper by Marcelo, Paul Bernal, using reading to teach English as a foreign language, MASKANA, Vol.11, No.2,18-26, https://publicaciones.ucuenca.edu.ec/ojs/index.php/maskana/article/view/3451 doi: 10.18537/mskn.11.02.02

learned incorrectly. Ineffective learning causes students to spend time that may be spent learning more. Even with just a few readings and translations, learners can memorize specific words very rapidly, especially those in which they are personally interested, but this is not the true for many words. Learners frequently must translate the same words several times to memorize them. This is natural; however, it can be the result of incorrectly learning new terms.

Thesis 4: Learners can perceive foreign words both audibly and visually by reading. The natural way of perceiving words is auditory, which suggests that this way of perceiving foreign words is also easier to memorize. Auditory perception has another indisputable advantage: together with the perception of words, learners can hear their correct pronunciation. But in no case, learners should neglect iconic memory. Reading and writing in learning a language is also particularly useful because it is a refreshment of memory.

9. Stages of foreign language word learning

- The audible perception of unfamiliar foreign words Unfamiliar foreign words can be heard in speeches or read in text.
- Learners must be able to clearly hear each word they hear in a speech. New words that are unknown should be accurately recognized before being properly uttered.
- When reading a text, readers should look up any unfamiliar words in a dictionary. Hearing the same word in an audio recording is beneficial as well. This feature is offered by some dictionaries, including Google Translate. Use dictionaries from recognized publishers is advised.²⁵
- With a suitable multistage learning process, unfamiliar foreign words can be learned.

9.1. First level of foreign language learning.

The first level includes the learning of foreign words without translation into the native language. Very often, learners hear unfamiliar words in combination with other lexical units (for example, prepositions). The current methodology requires that the new vocabulary should be the first presented to the learner through live speech, i.e., by audio recording or reading of the teaching material by the teacher. When the foreign language being taught is not the native language of the teacher, then it is better to use sound recordings of the so-called **native speakers**. Regardless of the source from which the unfamiliar word comes, learners should hear it repeatedly before moving on to the next stage of learning. The criterion for a sufficient sound presentation of new vocabulary is that the unknown words become recognizable to the learner, i.e., the word becomes as learned at the first level because the learners remember having previously heard that word. The correct pronunciation of words depends on their initial learning, which requires learners to hear the words very well and repeatedly.

The first meeting with the new and unfamiliar words is at the first phase of listening to the new vocabulary by **sensory** on to fig. 1-memory duration. In this phase of learning the new vocabulary, the learners' attention, their interest, and desire to hear and learn the unknown words are most important. The new vocabulary enters the **short-term memory** because of the focus. For its retention, it is necessary to hear the new foreign words several times before moving on to the next level. It is particularly important to note that, according to the theory, human memory can perceive up to seven units at once.

9.2. Second level of foreign language learning.

After learners hear one word repeatedly, teachers can then present it to the student and translate it into the learner's native language. It is especially important to use reputable dictionaries and to give students the basic meaning of the word and its meaning in the text they study. This process of repetition of the foreign word together with its meaning in the students' native language is useful because in this way, learners refresh sensory input, and it goes to the short-term memory. It is important to note that the capacity of short-term memory has a limit of seven items (letters, numbers, words, pictures, names...) at a time, i.e., any new teaching material should consider the physical capabilities of the human mind, and, from a theoretical point of view, it should not overload the learners. During an intensive study of the foreign language, in which in practice more than fifty unfamiliar words are heard per day, teachers must evenly distribute new unfamiliar words between the lessons of the day. Since the problem of losing information in short-term memory is increasing, learners can partially overcome it by constant repetition of the new vocabulary throughout all lessons during the day.

9.3 Foreign language learning at the third level.

At the end of the lesson per day, when the entire text of the material for the study has been translated and the student has written down the translations of all unknown words in the text accordingly, regardless of whether they are new unknown words or forgotten words from previous lessons, we can move on to a new multiple listening and reading of the text.

9.4 The fourth level of learning, in which all foreign word meanings are studied.

The study material should correspond to the planned vocabulary for study. At the end of the textbook, there should be a glossary with all the words used in the textbook, no matter whether they are from previous lessons and the textbook or not. All words must have equal repetition as far as possible. There is a need for continuity between the individual lessons in the textbooks. The fourth step in learning foreign words is learning all the meanings of the foreign words. There are languages, e.g., the English language, that include

²⁵ Article "Learning new words", British Council, https://learnenglishteens.britishcouncil.org/exams/grammar-vocabulary-exams/learning-new-words

phrasal verbs and words with multiple meanings, suggesting that the fourth stage of word learning can take a long time. ²⁶²⁷

10. Strategies for speaking fluently in a foreign language.

The fundamental objective of methods for foreign language learning is to attain the desired result (degree of language proficiency) in the most effective manner possible spending the least amount of time necessary to acquire the study material up to the desired level of foreign language competence. The phases of language acquisition must be completed by learners, regardless of their goals for their level of proficiency in a foreign language. The right training approach and careful organization of the training materials for each step of the training make it possible to reach the goal. Learners must progress through a series of stages to obtain the highest level possible. It is crucial in this instance that the intended learning material solely refers to the current.

- ❖ We can categorize the mastering of foreign languages into three degrees from a practical standpoint.
- Conversational level: calls for a vocabulary of 500–1000 words, mastery of the most important grammar rules, basic verb tenses, and the capacity to converse about everyday topics.
- Fluency level: being able to converse fluently on any topic as well as possessing a vocabulary of 2000–3000 words, verb tenses, and basic syntax are requirements for language proficiency. Language competency demands the ability to communicate clearly on any subject and the possession of a vocabulary of 2000–3000 words, verb tenses, and fundamental syntax.
- Expert level: the capacity to conduct translations on any subject and a vocabulary of at least 6000–8000 words are required for the expert level. In addition, one must be familiar with the complex verb tenses, other grammar rules, and the rest of the language to acquire a sophisticated speaking style. ²⁸

11. Research

I am delighted to share with you my personal experience and experimental work on myself:

I spent over eight years learning English, but my progress was extremely slow at first. I had already mastered the basics of English grammar, but I was still feeling like a beginner. Then I could read and translate from English to my native language, but I could not speak. I also could not understand English speech. Once, by chance, I listened to an audio transmission by The Voice of America—Special English Program, which I liked very much. I continued to follow this radio program regularly. Very soon, I realized that I had improved my English very much. I also started to speak and have real dialogue with British people. I can now say that the Special English Program of VOA and later BBC — Learning English programs helped me too

much. After 8 years of scholastic study of English, I started to listen to these radio programs, and they helped me to start speaking English fluently and later to reach an advanced level.

My second foreign language is Russian. I have never had an interest in Russian, but because it was a mandatory subject in my secondary and high school, I had to follow the school lessons regularly. The results of my Russian were extremely poor, but later when I started my career, I had to speak Russian at my job. Also, I used to watch Russian TV for a long time and can now say that I understand very well. When I don't know a certain Russian word, I usually refer to the dictionary. Now I can say that my passive Russian knowledge is excellent. I understand Russian very well when I read and listen, but when I speak Russian, I still make grammar mistakes, which is not a big problem for me because I usually use Russian for fun.

My third foreign language is Greek. I had Greek lessons with a teacher for 18 months. My Greek teacher taught me the basics of Greek grammar. I heard someone say that my passive Greek vocabulary consisted of about 750 words, but my active vocabulary had less than 300-350 words. I visited Greece 3 years after my first Greek lesson, and then I had my first live conversation in Greek. In comparison to my English lessons, I can say that the vocabulary I studied during my Greek lessons was not extensive, but instead of learning new unfamiliar words, I used to repeat what I had already learned. Later, I decided to follow a TV series in Greek. At the beginning, it was difficult for me to understand what I was hearing, but after 2-3 months of regular watching of Greek series, I began to understand well. Fifteen years after my first Greek lesson, I began to watch Greek series on YouTube.com Channel- (Family Stories), and now I am happy to say that I have begun to speak Greek fluently as a result of my regular viewing of Greek series.

My fourth foreign language is Italian. I started to study Italian 35 years ago. During this time due to lack of any satisfactory progress in Italian, I decided to stop studying Italian 3 times, but later I had continued without any progress again. Four years ago, I remembered myself how I had done my progress in English and Greek. That is why I decided to do the same by following TouTube.com channels in Italian language. Now I am happy with my Italian language progress. I understand Italian very well and planning to make a trip to Bella Italia to speak with Italians in the Italian language.

Personally, for me the best way to learn a foreign language for beginners is by listening comprehension, supported by grammar lessons in parallel. On upper stage of foreign language learning it is recommended reading comprehension supported by translations into both languages. The advanced grammar study is important too. I recommend language learners first to hear

²⁶ Article "6 Tips for Learning New Words", British Council, https://www.britishcouncilfoundation.id/en/english/articles/new-words

²⁷ Article "Seven steps to vocabulary learning ", British Council, https://www.teachingenglish.org.uk/article/seven-steps-vocabulary-learning

²⁸ Article: How many words do you need to know to speak a language well? Progress Language Train Solution, https://lto1progress.com/blog/2021/12/03/words-you-needto-know-to-speak-a-language/

more times any suitable foreign language audio type and only when they are sure that they have clearly heard the unfamiliar words more times, then they can check the dictionary for correct translation of the unfamiliar words. Students are going to understand the meaning of unknown words before they check their correct meaning in the dictionary.

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TECHNICAL SCIENCES

ERGONOMICS: THE POSSIBILITIES OF AI, ZKP AND ML

Dziatkovskii A.

Ph.D in Education (Artificial Intelligence / Zero Knowledge Proof / Blockchain / Data Science)

CEO Platinum VC & Incubator Australia

(AI; ML; Zk proofs; Blockchains based on C++ / Move / Rust / Solidity)

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Abstract

The directions of changes in ergonomics, which accompany the inclusion of artificial intelligence in the "human-machine" system, are considered. The problems of "weak" and "strong" artificial intelligence in ergonomics are presented.

Keywords: ergonomics, artificial intelligence, Zero-knowledge proof, problems.

Ergonomics studies the system "man-machine-environment", the interaction of man with the world, which is mediated by machinery and technology. In the 21st century this system is undergoing a major transformation. Technogenic environments include artificial intelligence and global communication information networks. A distinction is made between weak and strong artificial intelligence. A strong artificial intelligence is a machine capable of thinking, being aware of itself, learning something new. Weak artificial intelligence (narrow) are programs that perform routine human functions (translation, image recognition, calculations). Will strong intelligence ever be created and when will it surpass humans?

While there seems to be time before the development of strong intelligence, weak intelligence is already firmly established in our lives and helps to automate the actions traditionally performed by humans [1]. As the digital environment is created, so is the human being. He is actively creating a digital environment. The picture of cognitive processes in the "man-machine" system is being reconsidered, in which the brain as an instrument of cognition and the machine performing the routine cognitive functions of man are seen in a reciprocal relationship. The line between the subject and the object is erased. The line between "internal" and "external" intelligence is erased. The cognitive subject is embedded in an environment of artificial intelligence, which optimizes brain activity. Ongoing processes of continuous updating, operational control and correction of parameters of the technical part of the system change human mental functions and simultaneously exist independently of him. Intelligence loses its specificity of a purely human property.

The object of study of classical ergonomics is also changing. It becomes interdisciplinary, includes all forms of human interaction with the world, which are mediated by technology and technology, to create effective ergonomic systems [4].

Neoclassical ergonomics included engineering psychology and studied complex man-made environments endowed with artificial intelligence and global communication information networks as self-developing systems. Holistic approach in such a system began to consider a person as a subject that is actively embedded in the environment, forming a unified cognitive system. The line between subject and object, internal and external intelligence is blurred.

Mental functions are seen as embodied in the human body and, at the same time, as existing independent entities. Intellect becomes an emergent property of the whole complex system. It is likely that in the near future it will be impossible to imagine the ergonomics of work without the participation of artificial intelligence, which will control the process from beginning to end.

Today, the development of artificial intelligence is associated with the development and adaptation of AI products and services for a large range of applications [5].

If the center of natural intelligence is consciousness transforming the world, then artificial intelligence is a program, an algorithm, situational control of the world, and hybrid intelligence is a mutual adaptation of natural and artificial intelligences, their symbiosis.

Hybrid intelligence reflects the results of selection and application by the self-organizing system of effective ways to achieve the goal in an organized environment. The purpose of the whole system is to ensure the comfort, safety and efficiency of automated workplaces of labor subjects [2,3].

It is believed that modern ergonomics, uniting with many related sciences, is transformed in three directions:

physical, based on a detailed analysis of anthropometric, physiological, psychophysical, hygienic properties of the human body and their involvement in creating optimal working conditions;

cognitive, based on the models of human work with artificial intelligence through mental processes: memory, thinking, attention, speech, perception;

organizational, guaranteeing the quality and reliability of the results of hybrid intelligence, goods and services.

Of course, modern ergonomics fundamentally changes the attitude to labor, the ways of its organization and improvement. The traditional tasks of ergo-

nomics are also changing. As digital transformation intensifies, new formats of communication emerge to solve a whole range of problems, new ethical problems - and there are options for solving them.

For example, the problem associated with depersonalization and data storage mechanisms. Today artificial intelligence has acquired a powerful assistant in the form of Zero Knowledge Proof, the tasks of storing anonymous information in a secure state data system are set [3].

AI can quickly find grammatical, punctuation and semantic errors in the text. This saves up to 20% of the teacher's time. In general, AI is effective wherever you can standardize. But what about ethical problems? Gaggle analyzes students' email correspondence and social media activity and informs school administrators of potential safety hazards. Surveillance? Distrust? And psychological discomfort is one of the indicators of failed ergonomics.

Excessive "digitization" of educational activity can lead to certain threats and challenges. Multisubject relations will be destroyed. There will be collisions of individuality, uniqueness, on the one hand, and the conveyor belt, on the other. Threats of discrimination against citizens and organizations will arise due to the possible presence of biases in the algorithms, intentionally or unconsciously introduced by the developers. At the same time, it is extremely difficult to detect AI errors and even more so to appeal against them, because access to such systems by outside experts is closed. The problem of incorrect interpretation of data by artificial intelligence and "raw" its algorithms remains [6,7].

Ergonomics offers an evaluation of AI systems by independent experts, the presence of warnings about the use of AI, the availability of a backup plan in case of failures and other unforeseen situations. At the same time, the regulation of technical processes in the field of AI at the level of laws and regulations may negatively affect the development of the market, while protecting citizens and organizations from the negative consequences of its use will not increase.

Strong intelligence raises even more questions. These are mostly ethical questions. Will AI be able to resolve moral issues in a situation of choice? Can autonomous weapons be created? Will the AI be offended? feel hurt? lonely? And who will control it? What could go wrong? [8]

Conclusions. Artificial intelligence issues are poorly developed in terms of ergonomics. We will rely on machine learning more and more, we will have good

intentions. AI improves human performance and efficiency. AI is necessary in critical situations to reduce casualties. But there remain issues of psychological comfort, trust, safety, and ethics, which are difficult to formalize and differ from country to country. We cannot always fully rely on AI's judgment. After all, it can be "poisoned," used for inhumane purposes. There is a lot of work ahead and new challenges.

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AUTONOMOUS MICROCO - GENERATOR POWERED BY BIOGAS

Efimova O.N.,

PhD, docent

NPJSC Almaty University of power engineering and telecommunication named after Gumarbek Daukeev

Maratova A.K.

Master degree

NPJSC Almaty University of power engineering and telecommunication named after Gumarbek Daukeev

АВТОНОМНЫЙ МИКРОКОГЕНЕРАТОР РАБОТАЮЩИЙ НА БИОГАЗЕ

Ефимова О. Н.

к.т.н., доцент

НАО Алматинский университет энергетики и связи им. Гумарбека Даукеева

Маратова А.К.

Магистр

HAO Алматинский университет энергетики и связи им. Гумарбека Даукеева https://doi.org/10.5281/zenodo.7878473

Abstract

This paper examines the development of a micro-cogenerator prototype that is capable of producing 2.0 kW of electric power and 5.0 kW of thermal power. It is designed for isolated locations and is powered by gas generated from biomass anaerobic digestion. This unit is based on a prototype created at the Istituto Motori CNR of Italy and is intended to be used with small biomass reactors that require some of the heat produced by the internal combustion engine to operate efficiently.

The internal combustion engine has been modified to use natural gas with partial methane content or LPG when necessary. The generator is a permanent magnet generator powered by a low cost inverter that is both efficient and lightweight, allowing for the inclusion of an electric energy storage system to compensate for service interruptions.

The main objectives of this cogeneration unit are decreasing of cost, longevity, low noise, vibration, and good electrical effectiveness. It has a lot of options when it comes to providing gas and electric needs, making it a smart and cost-effective way to convert energy in many situations where electricity is not easily available, as well as reducing CO2 emissions.

Аннотация

В данной статье рассматривается разработка прототипа микрокогенератора, способного производить 2,0 кВт электроэнергии и 5,0 кВт тепловой мощности. Он предназначен для одиночных автономных приложений и питается от газа, полученного в результате анаэробного сбраживания биомассы. Эта установка основана на прототипе, созданном в Istituto Motori CNR в Италии, и предназначена для использования с небольшими реакторами на биомассе, для эффективной работы которых требуется часть тепла, производимого двигателем внутреннего сгорания.

Двигатель внутреннего сгорания был модифицирован для работы на природном газе с частичным содержанием метана или сжиженном нефтяном газе, когда это необходимо. Генератор представляет собой генератор с постоянными магнитами, питаемый от недорогого инвертора, который одновременно эффективен и легок, что позволяет использовать систему накопления электроэнергии для компенсации перерывов в обслуживании.

Основными целями этой когенерационной установки являются снижение затрат, долговечность, низкий уровень шума/вибрации и хороший электрический КПД. У него есть множество вариантов, когда речь идет об обеспечении потребностей в газе и электричестве, что делает его разумным и экономичным способом преобразования энергии во многих ситуациях, когда электричество не всегда доступно, а также снижает выбросы CO2.

Keywords: biogas, microco - generation, microgrids, distributed generation, natural gas.

Ключевые слова: биогаз, микрокогенерация, микросети, распределенная генерация, природный газ.

1. Введение

Микрокогенерация считается разумным способом преобразования энергии для домов и дешевым способом достижения полного использования энергии топлива вместе со значительным сокращением выбросов СО2. Что касается очень малых энергосистем (т.е. менее 2,5 кВт электроэнергии) имеющиеся на рынке системы, приводимые в движение двигателем внутреннего сгорания, могут производить электрическую мощность от 1 до 2,5 кВт, например, Ecowill- Honda [1], AT-Motoren Vulcan [2], Proenvis Prio 5.2 [3] — эти модели предлагают довольно интересные общие характеристики с точки зрения электрического КПД (около

25%) и коэффициента мощности Р.Е. R. (Коэффициент первичной энергии, который представляет собой коэффициент использования энергии топлива) составлял от 85% до 93%.

Агрегат Honda (разработанный совместно с Vaillant) имеет электрическую мощность 1,0 кВт, тепловую мощность 2,8 кВт с чистым электрическим КПД ηЕ.Е=26%, этот результат был достигнут благодаря использованию нетрадиционного термодинамического цикла метода Аткинсона (с тактом расширения, более длинным, чем такт сжатия).

AT-Motoren Vulkan — еще один агрегат, доступный только для немецкого рынка, который имеет больший рабочий объем и электрическую мощность от 1,5 до 2,5 кВт, а тепловую мощность — от 3,0 до 5,0 кВт. Система может обеспечить интересный чистый электрический КПД ηЕ.Е=24% и хорошее Р.Е. R. = 90% благодаря дополнительному теплу, полученному от асинхронного генератора с жидкостным охлаждением. Третий блок был недавно представлен на рынке и характеризуется одним цилиндром и диапазоном электрической мощности от 1,3 кВт до 2,0 кВт и тепловой мощностью от 3,5 до 5,2 кВт с максимальным электрическим КПД 25%. Другие термодинамические циклы, такие как цикл Стирлинга, далеки от приведенных выше значений электрического КПД (установленного между 10% и 15%) и по этой причине не могут конкурировать с двигателями внутреннего сгорания даже с точки зрения оптимального соотношения электрической/тепловой мощности, требуемого современными двигателями. высокоэффективные дома с уменьшенной потребностью в энергии. Наоборот, агрегаты на основе двигателей внутреннего сгорания больше подходят для такого рода коммунальных услуг, но все же имеют некоторые недостатки, такие как громоздкость, низкий электрический КПД, но в основном общая стоимость, что делает необходимой некоторую государственную финансовую поддержку быть действительно привлекательным.

В то же время были рассмотрены три различных прототипа, спроектированных, построенных и

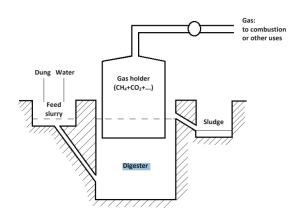


Рис. 1: Внутренняя схема метантенка биогаза.

Чтобы еще больше повысить производительность газа, метантенки для биогаза последнего поколения могут быть объединены с когенерацион-

разработанных авторами в [5-8], характеризующихся одинаковой электрической мощностью, всегда работающих на газовых смесях, таких как природный газ или газы на основе метана.

Целью сравнение упомянутых микрокогенераторов было достижение более высокой средней нагрузки (по сравнению с другими конкурентами), тем самым повышая глобальную эффективность. В каждом случае для этих систем был зарегистрирован лучший электрический КПД (до ηЕ.Е=26%), даже если более высокие нагрузки и удельная мощность требовали более точного контроля соотношения воздуха и топлива и специального трехкомпонентного катализатора, особенно уменьшить очевидный тенденция к более высокому образованию NOX (из-за более высокой температуры, достигаемой при сгорании).

2 Эксперимент: новый двигатель на биогазе

На основе современного уровня техники и опыта, накопленного при работе с вышеупомянутыми различными прототипами, был разработан новый двигатель для использования биогаза в качестве основного топлива или, в качестве альтернативы, сжиженного нефтяного газа. Биогаз является очень привлекательным способом преобразования биологических отходов животных, человека и биомассы в газ на основе метана, пригодный для преобразования энергии. В последние годы на рынке было предложено много небольших реакторов, поскольку они могут быть приняты во многих ситуациях (например, в небольших фермах, сельских общинах, особенно в странах третьего мира и странах с развивающейся экономикой), где существует насущная потребность в энергии (электроэнергии). , горячая вода или газ для приготовления пищи). Эти системы достаточно просты в управлении и абсолютно рентабельны с точки зрения собственной эффективности, а также решают очень важную проблему с точки зрения удаления биологических отходов, потенциально очень опасных при неправильном обращении. На рис. 1 и 2 представлены схема малого биогазового реактора и внешний вид серийно выпускаемой установки



Рис. 2: Внешний вид малой биогазовой установки.

ными установками, поскольку часть тепла, производимого двигателем внутреннего сгорания, может нагревать реактор, обеспечивая стабильное и эф-

фективное поведение в отношении химических реакций. В частности, фиксирование температуры между 35°С и 40°С может ускорить процесс преобразования и сделать систему нечувствительной к внешней температуре. Таким образом, комбинация когенерационной системы и такого типа преобразователя биомассы может быть действительно привлекательной для надежной и экономичной системы, решающей наиболее важные вопросы, такие как габаритные размеры и полный рабочий контроль.

Для достижения этого результата должна быть принята надежная когенерационная установка малой мощности, специально разработанная для работы на топливе на основе метана, простая и абсолютно надежная в отношении срока службы. То же самое было непосредственно основано на одном из трех блоков [7], сохранив ту же архитектуру и большинство технических решений, то есть одноцилиндровую вертикальную компоновку коленчатого вала, движение толкателя и коромысла клапана с гидравлическим подъемником и полным масляным охлаждением, что дает ему большую часть технического решения, обычно используемого для двигателей большой мощности.

Что касается архитектуры цилиндра и головки, то для этого конкретного прототипа было решено отказаться от предыдущего решения, которое заключалось в единой компоновке (цилиндр и головка), потому что это приводило к удорожанию с точки зрения производственных затрат и меньшей

управляемости с точки зрения стандарта качества.; также заявленные преимущества, связанные с отсутствием какой-либо прокладки головки блока цилиндров, оказались незначительными для этой удельной мощности. Были спроектированы и изготовлены новый цилиндр и головка, а конструкция впускного канала была существенно изменена, чтобы улучшить турбулентность и скорость сгорания при работе на такой низкой скорости 1800 об / мин.

Водоизмещение должно было учитывать переход на газообразное топливо с более низким содержанием энергии, такое как биогаз. Таким образом, был принят больший рабочий объем по сравнению с предыдущим прототипом [7], в котором использовался другой поршень с большим отверстием, только что выбранный из стандартного серийного производства. Камера сгорания расположена внутри днища поршня и имеет вогнутую форму с ограниченной площадью сжатия (относится к общей площади сечения цилиндра). Степень сжатия, выбранная для этого прототипа, составляла 12,6, что является достаточным для достижения высокой эффективности и все еще далеко от проблем с детонацией. Этот последний результат является результатом сочетания высокой турбулентности, создаваемой впускным каналом, вместе с компактной камерой сгорания и использованием биогаза в качестве топлива, характеризующегося высоким октановым числом (О.№ 115). В таблице 1 обобщены основные характеристики двигателя.

Таблица 1

Характеристики двигателя.

Цилиндр	1 (вертикальная ось)
Объем	190 cm^3
Коэффициент сжатия	12,6
Скважина	63,5 мм
Длина хода	60 мм
Длина стержня	98 мм
Диаметр впускного клапана	26 мм
Диаметр выпускного клапана	22 мм
Клапан рабочий	Толкатель и коромысло
Система охдлаждения	Масло (головка и цилиндр)
Система смазки	масло под полным давлением

Агрегат был разработан для работы только в условиях полной нагрузки, поэтому дроссельный клапан на впускном канале не рассматривался. Чтобы обеспечить прямолинейное стехиометрическое управление и заставить трехкомпонентный катализатор на выпуске работать в наилучшем состоянии и с максимальной эффективностью, был установлен еще один регулирующий клапан, настроенный для управления подачей топлива в двигатель и учитывающий различный состав природного газа в зависимости от поведение биогазового реактора.

Управление расходом топлива контролируется электронным блоком управления, специально разработанным для этого прототипа. Эта же система также управляет высокоэффективной системой зажигания, способной производить искры высокого напряжения (> 28 000 В), что подходит для газовых смесей на основе метана, особенно при высоком давлении в конце сжатия.

На рис. 3 и 4 представлены соответственно прототип в разрезе и его внешний вид.



Рис. 3: Прототип в разрезе.



Рис. 4: Внешний вид прототипа.

Двигатель был снабжен новой конструкцией единого корпуса системы выпуска отработавших газов, в котором седло лямбда-зонда, катализатор, теплообменник и глушитель расположены в одном цилиндрическом корпусе из нержавеющей стали.

Выходящий газ сначала проходит через трехходовой катализатор, а затем выходит наружу по коаксиальному двойному спиральному водяному каналу, который действует как теплообменник и глушитель. Спасательный контейнер можно увидеть на рис. 5.



Рис. 5: Ресивер с катализатором, теплообменником отработавших газов и глушителем.

Лабораторные инструменты, используемые для определения характеристик выбросов: первичный выхлопной газ был проанализирован с помощью измерительной системы API-COM (мод. S-5000), состоящей из анализаторов NDIR (недисперсионный инфракрасный детектор), CLD (хемилюминесцентный детектор) и FID (пламенно-ионизационный детектор) от Emerson.

Биогаз, использованный во время полевых испытаний, был получен вне реактора, т.е. путем смешивания метана и СО2 и других нереакционноспособных газов (таких как N2). В Таблице 2 представлены глобальные характеристики принятого биогаза. В таблице 3 указана общая мощность двигателя внутреннего сгорания при эталонной скорости 1800 об/мин после стандартного катализатора.

Таблица 2

Глобальные характеристики биогаза.

CH ₄	CO ₂	Другие	L.H.C. МДж/нм ³	Октановое число
62.0	35.0	3.0	23.0	115

Таблица 3

Общие характеристики тормоза

общие характеристики тормоза:							
Мощность	Скорость	MHC	CO	NOx	CO ₂	O_2	Глобальная
[кВт]	[об/мин]	[ч/млн]	[%]	[ч/млн]	[%]	[%]	эффективность
2.1	1,800	450	0.05	265	12.9	0.06	0.32

Полученные результаты весьма интересны, если отнести их к экспериментальной установке не только с точки зрения глобальной эффективности, но и в отношении выбросов, благодаря стехиомет-

рической настройке, исключающей метановые углеводороды. Этот аспект можно было бы еще улучшить, если бы был доступен оптимизированный трехкомпонентный катализатор небольшого раз-

мера, поскольку стандартный катализатор не предназначен для окисления такого стабильного компонента, как молекула метана.

3 Электрическая система

Оптимизация двигателя привела к максимальному крутящему моменту при фиксированной скорости вращения около 1600 об/мин, за которым последовало медленное уменьшение наклона кривой крутящего момента для более высоких скоростей. Таким образом, двигатель был готов создать условия для стабильной работы в паре с электрогенератором. Конечной целью этой микрокогенерационной установки было производство вне сети 230 В переменного тока, что вполне эквивалентно сети по качеству электроэнергии.

Та же платформа может быть также подключена к сети (если таковая имеется) с выпрямителем,

который может питать звено постоянного тока инвертора и, в конечном итоге, систему хранения. Этот последний элемент может быть действительно фундаментальным для удовлетворения реальных потребностей автономных коммунальных предприятий с их колебаниями мощности, обеспечивая то же самое через систему сглаживания пиковых нагрузок. Общая схема микрокогенерационной установки с интерфейсным преобразователем и накопителем энергии показана на рис. 5 [8], с системой генерации, активным выпрямителем (VSR), управлением накопителем (пакет DC/DC, подключенный к сети).) и интерфейсный преобразователь (VSI), подключенный к нагрузкам 230 В переменного тока.

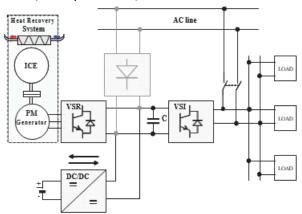


Рис. 5: Схематическое изображение когенерационной установки с интерфейсным преобразователем.

Выбор электрического генератора был сделан среди множества различных трехфазных блоков с постоянными магнитами из-за их внутренней высокой удельной мощности и эффективности, возможно, с водяным охлаждением для большей компактности и снижения шума. Это решение может также обеспечить существенное уменьшение габаритных размеров, поскольку не нужно использовать охлаждающий вентилятор и систему впуска воздуха с большим глушителем. Поскольку генераторы с жидкостным охлаждением не были доступны, было решено использовать обычный генератор с маховиком массового производства с воздушным охлаждением и оснастить его корпусом новой конструкции с внешней циркуляцией воды (предназначенной для охлаждения некоторых конкретных деталей, таких как ламинаты магнитного железа) и внутренняя циркуляция воздуха, нагнетаемая вентилятором и предназначенная для контроля температуры змеевиков, что приводит к полной герметизации для снижения уровня шума.

Генератор прошел стендовые испытания с резистивной цепью для изменения внешней нагрузки, температура водяного охлаждения была зафиксирована на уровне 50°C, что можно считать нормативным значением расхода воды на выходе в системе отопления дома. Был получен набор экспериментальных данных, которые затем представлены в Таблице 4, где мощность, КПД и коэффициент мощности представлены в зависимости от скорости вращения. Был измерен КПД генерации электрической машины ηдеп=89,8%, тогда как для интерфейсного преобразователя измеренный КПД составил ηсопv=96%, что дает КПД генерации электроэнергии (генератор и инвертор) пе.д.=86% при 230°С. VAC, последний результат очень интересен. Электроэнергия, которую может производить система, может немного отличаться в зависимости от эффективной точки согласования с двигатель внутреннего сгорания, то есть рабочее состояние, при котором кривая крутящего момента, обеспечиваемая двигателем внутреннего сгорания, совпадает с кривой пассивного крутящего момента генератора.

Таблица 4

Характеристика напряжения/скорости генератора.

Скорость [об/мин]	1800	1600	1400	1200
Эл. мощность [кВт]	2.30	2.0	1.65	1.30
Фактор силы	0.93	0.93	0.92	0.92
Эл. эффективность [%]	89.8	88.5	86.3	85.9
Механическая мощность [кВт]	2.50	2.25	1.90	1.50
Потери [кВт]	0.30	0.25	0.25	0.20

4 Результаты и выводы

Две системы, проанализированные отдельно, рабыли окончательно соединены и испытаны, чтобы получить глобальную производительность в каче-Таблица 5: Общая электрическая и тепловая мощность.

стве генератора электроэнергии и тепла. Характеристики микрокогенератора по вырабатываемой электрической мощности в комплекте с инвертором приведены в таблице 5.

Мощность	Скорость	Суммарная	Суммарная	Электрический	Тепловой
[кВт]	[об/мин]	теплота [кВт]	энергия [кВт]	КПД [%]	КПД [%]
1.95	1,770	4.57	7.60	25.6	60.0

Результаты довольно интересны, если говорить об экспериментальной установке, но они не совсем показали ожидаемое поведение в отношении выходной электрической мощности с производительностью 1,95 кВт при 1770 об/мин вместо ожидаемых 2,25 кВт (на основе электрических характеристик генератор и инвертор). Это можно объяснить меньшей стабильностью крутящего момента, типичной для одноцилиндрового четырехтактного двигателя [5]. Как видно, точка согласования между двигателем и генератором была достигнута при более низкой скорости, когда двигатель создает более высокий крутящий момент, а генератору требуется более низкое его значение.

Что касается тепловой энергии, то тепло от электрогенератора, охлаждения двигателя (головка и рубашка цилиндра) и выхлопных газов регенерировалось с помощью показанного выше охлаждаемого электрогенератора, многопластинчатого теплообменника (для смазочного/охлаждающего масла двигателя). и, наконец, с помощью упомянутого выше теплообменника-катализатора с одним корпусом. При номинальной электрической мощности 1,95 кВт установка вырабатывает 4,57 кВт тепловой мощности при тепловом КПД 60 %, соответствующем П.Э.Р. 85,6% и тепловое/электрическое отношение ηТ/Е около 2,35, это значение хорошо подходит для большинства бытовых применений или может быть частично принято для нагрева биогазового реактора. Что касается термической эффективности, то прототип не был снабжен какой-либо ступенью конденсации, поскольку обычно биогаз может содержать некоторое количество сернистого компонента, который при контакте с водой может образовывать некоторые агрессивные компоненты (кислоты).

Предлагаемая микрокогенерационная установка показала интересные общие характеристики, очень похожие на другие коммерческие конкуренты, и в будущем ее можно улучшить во многих аспектах. Конечная цель 2,0 кВт электроэнергии была вполне достигнута, и дальнейшие разработки двигателя внутреннего сгорания могут улучшить как электрический, так и тепловой КПД. Что касается газообразных выбросов, система должна быть снабжена эффективным малым катализатором, созданным специально для оксидных метановых углеводородов.

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