Electronic Research Conference

INTERNATIONAL SCIENTIFIC SOLUTIONS

2022

February, 9

New York 2022

Electronic Research Conference

INTERNATIONAL SCIENTIFIC SOLUTIONS 2022

New York 2022

Proceedings of the Electronic Research Conference **"International Scientific Solutions 2022",** February 9. - New York : Infinity publishing, 2022.

ISBN 978-5-905695-82-7

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ISBN 978-5-905695-82-7

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DOI 10.34660/INF.2022.24.35.001

CLUSTERING AS A WAY TO INCREASE THE EFFICIENCY OF THE FUNCTIONING OF THE REGIONAL ECONOMY

Zhukov Boris Mikhailovich
Doctor of Economic Sciences, Full Professor
Reshetova Natalia Yurievna
Applicant for a science degree
Gorlachev Pavel Viktorovich
Candidate of Economic Sciences, Associate Professor
Cooperative Institute (branch of the Russian University of Cooperation), Krasnodar, RF

Abstract. *The experience of many European countries irrefutably proves that clustering is an important way to achieve a high level of efficiency in the functioning of regions. The cluster concept has received worldwide recognition, since the evolutionary development of cluster formations of various types has led to the efficient functioning of enterprises in the regions, the creation of new jobs, an increase in income and an increase in the living standards of the population. The article summarizes the positive aspects of the creation and functioning of clusters in the regional economy, analyzes various points of view and scientific approaches to determining the essence and content characteristics of economic trends in the development of cluster formations, rationalizing the forms of their organization and improving the efficiency of investment processes.*

Keywords: *cluster, cluster approaches, clustering efficiency, regional economy, investment processes*

One of the main tasks at the present stage of development of the domestic economy is to increase the efficiency of the functioning of the regions. The solution to this problem involves the rational use of the production and human potential of the regions, the use of modern marketing tools and progressive forms of management of the territorial economy.

The experience of many European countries irrefutably proves that clustering is an important way to achieve this. The cluster concept has gradually gained worldwide recognition, since the evolutionary development of cluster formations of various types has led to the efficient functioning of enterprises in the regions,

the creation of new jobs, an increase in income and an increase in the living standards of the population.

The positive aspects of the creation and existence of clusters are manifested in the following:

• firstly, for the cluster members, an increase in labor productivity is ensured, and for the region - strengthening its own competitive status, strengthening competition both among enterprises at the intra-cluster, and intra-regional and inter-regional levels. At the same time, in the conditions of the formation and functioning of clusters, difficulties in creating the necessary infrastructure are more easily overcome, since both the clustered enterprise, local governments, cluster management, and public organizations are interested in this;

• secondly, for the participants of cluster formations, a positive aspect is the reduction of transaction costs, and for the region - the intensification of entrepreneurial activity. At the same time, the difficulties in creating clusters in the context of this problem are stipulated by the lack of capital and skilled labor. The essence of transaction costs is that in order to carry out a market transaction, it is necessary to determine with whom it is desirable to conclude a deal, inform the participants about the terms of the transaction, conduct preliminary negotiations with them, prepare a contract, collect data to make sure that the terms of the contract will be fulfilled by all participants of a cluster formation. We believe that when forming clusters, comprehensive financial assistance should be provided by state and regional authorities, the leader of the cluster formation, enterprises and organizations - participants in the formation. Note that the concept of transaction costs, like the cluster concept, arose almost simultaneously. Higher education institutions of the regions can provide a qualified workforce for clustered enterprises and organizations with the involvement of foreign scientists and specialists with experience in cooperation with cluster formations.

A possible option for preparing a qualified workforce for the needs of clustering objects may be sending a workforce abroad from the region to gain experience and master the necessary specialties.

• thirdly, for the participants of cluster formations, prerequisites are created to increase the ability to perceive innovations, and for the region - to increase investment attractiveness. At the same time, difficulties arise in the hierarchy of clusters for lower-level suppliers, and therefore, in our opinion, it is necessary to introduce marketing management at all levels of clustering;

• fourthly, the positive aspects of the functioning of clusters are also manifested in the fact that enterprises and organizations are provided with better access to sales markets, specialized suppliers and the adoption of technological solutions, and for the region - promotion of the most rational use of resources. At the same time, the difficulties for creating clusters are manifested in the blocking effect on the part of individual companies, which may be more competitive compared to clusters;

• fifthly, the advantages in the creation and functioning of clusters for participants are manifested in their greater flexibility, economies of scale and synergy effects, and for regions - in improving the innovation environment. However, in addition to the positive aspects, there are difficulties in creating clusters as a result of the threat of hyper-specialization and excessive "branding";

• sixth, under the conditions of clustering, there is a high probability of the formation of new enterprises in certain local territories, which will ensure the growth of export potential and create prerequisites for the sustainable development of social processes in the region. However, according to some scientists in their studies, there is often a disinterest of state authorities, a misunderstanding of the benefits of the cluster approach. We believe that this point of view does not have sufficient justification, since in the regions of the Russian Federation the problem of clusters is rapidly updated, becoming the topic of many conferences and publications.

Based on the generalization of a significant amount of scientific sources, the following definitions of this category have been identified [1-5]:

- innovation cluster - an integral system of enterprises and organizations for the production of a finished innovative product, which includes the entire innovation chain from the development of a fundamental scientific idea to the production and distribution of finished products [6];

- an innovation cluster is an association of various subjects of public life (industrial companies, research centers, government bodies, public organizations), which allows you to use the advantages of two ways of coordinating the economic system - an intra-company hierarchy and a market mechanism, and also makes it possible to more quickly and efficiently use new knowledge, scientific discoveries and inventions [6,10].

The authors of this study give their own definition of the category "investment cluster", namely:

- an investment cluster is an association of various organizations (industrial companies, research centers, scientific institutions, government bodies, trade unions, public organizations, etc.), which allows you to use the advantages of intra-company coordination and the market mechanism for faster and more efficient mastering of new knowledge.

Successful innovation clusters take advantage of their strengths and their ability to carve out niche markets by improving quality, using new multi-functional manufacturing technologies, and quickly making changes to the organization of production.

At the same time, innovations spread through the network of interconnections in the common economic space, facilitating the combination of production factors [7,11,12].

However, innovation clusters cannot be identified with what is seen as a high-tech (high-tech) sector. Indeed, even firms in traditional sectors such as textiles

and clothing, leather and footwear, food, wine, etc. must absorb new technologies into their design, production and marketing processes if they are not to remain obsolete and decline over time.

Based on the clustering of the economic system, there is an improvement in the mechanism of action of economic laws, which is as follows [8,9]:

• the development of economic laws occurs as a result of the economic activity of people, the functioning and growth of their needs and interests;

• There are three main phases in the development of law: identity and difference, contradiction itself, conflict and resolution of the contradiction, which are simultaneously accompanied by the transition of cause into effect, mutual transitions of opposite sides of the law, etc.

In the phases of identity and difference, economic laws are part of the laws of the formation of certain phenomena, processes; in the phase of contradiction - the laws of their development and functioning; in the conflict phase, the laws of transition to a new, more developed phenomenon, a more perfect form of one's evolution, etc.;

• the complication of the mechanism of operation of the law of the adequacy of production relations to the level and nature of the development of productive forces without taking into account the subjective factor is due, first of all, to the appearance of new elements within the productive forces (forms and methods of organizing production, science, etc.). Quantitative and qualitative changes in the traditional elements of the system, and consequently, the presence of a much more complex structure of productive forces, new laws and contradictions within this system; largely similar changes in economic property relations, etc. So, the development of clusters today is one of the most important ways to improve the mechanism of operation of economic laws and the development of the world economic system, and the main competitive advantages in the global economy are growing, paradoxically, from a geographical location (territory, region) where the cluster is located. Therefore, in order to organize more in-depth studies on the benefits of the cluster approach, the OECD Secretariat (National Innovation System, OECD, Paris) created a Task Force on Cluster Policy and Cluster Analysis in 1997, the most important starting points of which are:

- firms rarely innovate in isolation. This happens much more intensively in networked production systems; - the synergy effect, is born in the combination of knowledge of different firms and organizations that complement each other, and the need for firms to deal with the growing dependence on environmental conditions, which is a factor that encourages the formation of clusters and the conclusion of joint innovation agreements by firms. This is the initial theoretical position of the interaction-based theory of innovation systems, where innovation is defined as an interactive learning process based on the exchange of knowledge and joint activities of various participants in production networks.

At the same time, effective innovations are born from "new" combinations of complementarity, diverse knowledge and competence. This also coincides with the trend of transition from a policy of direct state intervention in the economy to the creation of mechanisms and incentives that allow indirectly (indirectly) influencing the processes of creating and functioning of network structures, in particular cluster formations. The role of the government as an assistant in the formation of clusters should be manifested in the function of a catalyst, broker, and also the creator of the necessary assistance institutions.

The formation and functioning of clusters reduces and even levels out the effect of the mechanism for reducing the main economic risks. Such risks in the sphere of direct production and exchange are material and technical, profile and technological, supply and marketing, production, credit. To reduce these risks for non-clustered enterprises, the following measures are taken:

- joint ventures are created with foreign firms, association with powerful and advanced domestic companies seeking state support (in case of stable demand for a certain type of product), etc., in order to reduce material and technical risks;

- reduction and then elimination of profile-technological risks is possible under the condition of: diversification of production due to the expansion of new technologies and types of products; diversification of supplies; collection of economic information about possible suppliers, in particular, about the development of new types of equipment and technologies; establishing non-commercial relations with real and potential suppliers, expanding and maintaining personal contacts with them; purchases of shares of supplying enterprises; creation of insurance reserves of the main components.

However, in our opinion, in order to level the negative impact of the mechanism for reducing and then eliminating the main economic risks for independently functioning firms (enterprises) and organizations, primarily small and medium-sized businesses, it is necessary to integrate them into cluster networks, the role of which is growing in the conditions of regional and local economy.

Cluster researchers have noticed that it is possible to trace the root causes of the origin and development of clusters that have arisen in regions due to certain historical conditions. Most often, the determining factor here is the presence of one or more specialized factors, the availability of the necessary infrastructure, special skills among the population, a favorable geographical position, etc. The presence of natural resources is also one of the significant factors due to which most of such powerful Finnish clusters have arisen, such as timber, non-ferrous metals, paper and cardboard, environmental protection equipment and a number of others.

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DOI 10.34660/INF.2022.67.61.002

CORONAVIRUS PANDEMIC: SOCIO–ECONOMIC CONSEQUENCES AND ANTI-CRISIS POLICY IN MODERN COUNTRIES

Narimanov Nariman Fariman oglu
Candidate of Economic Sciences, Associate Professor,
Academy of the FPS of Russia
Narimanova Olga Vladimirovna
Candidate of Economic Sciences, Associate Professor, Head of the Department
Ryazan State Medical University

Abstract. *The article contains an analysis of the socio-economic consequences of the coronavirus pandemic in modern countries. Trends generated by the pandemic, long-term challenges, as well as models of anti-crisis policy are investigated. Special attention is paid to the contradictions in the field of fiscal and monetary incentives that arise as a result of attempts to mitigate crisis shocks. It is emphasized that a significant part of these difficulties is associated with the persistence of unresolved structural problems posed by the global crisis of 2008-2009. The conclusion about the increasing role of the state in regulating the economy in modern conditions is substantiated. The impact of the pandemic on the processes in the sphere of globalization is being investigated.*

Keywords: *coronavirus pandemic, crisis, anti-crisis policy, government regulation, technological uncertainty, investment, globalization*

Introduction

After the global financial crisis of 2008-2009, the world economy and politics were in a state of uncertainty, which culminated in a new shock – the COVID - 19 pandemic. Although the pandemic provoked an economic crisis, it is neither cyclical, nor financial, nor structural in nature. The nature of this crisis as a whole is not economic, since it was the result of a natural (biological) cataclysm, i.e. caused by factors exogenous to the economy. The external shock triggered complex crisis and transformational processes affecting all aspects of society. Profound structural shifts are taking place, with long-term consequences. Remote forms of interaction between people and organizations have become widespread, problems of spatial organization of production have been perceived in a new way, the role of healthcare in society has been reassessed.

The purpose of the study is to analyze the socio-economic consequences of

the coronavirus pandemic, the long-term challenges and trends generated by it, as well as the problems of anti-crisis policy in modern countries.

Materials and methods

The study is based on scientific publications of foreign and domestic experts devoted to the socio-economic problems of the coronavirus pandemic. General scientific research methods were used: analysis and synthesis, induction and deduction, a systematic approach, comparative analysis, economic and statistical analysis.

Results and discussion

The modern crisis generated by the pandemic has a number of features that give it a unique character. The crisis combines three types of contradictions:

1. The contradiction between the need to actively use fiscal and monetary stimulus measures and their extremely limited effectiveness. Financial injections can only mitigate the painfulness of shocks, but they are not able to eliminate the causes that give rise to them. In addition, these measures may cause serious destabilization and stagflation in the future [1].

2. The contradiction between the exogenous shock and the structural problems of the economy. In modern conditions, there is no financial crisis, which is an attribute of structural crises. Firms are experiencing liquidity problems, not solvency problems, so governments can and should provide them with economic support. At the same time, the unresolved problems of the global structural crisis of 2008-2009 persist. The Governments have not carried out structural reforms, fearing increased socio-political instability. This led to a further increase in government debt and central bank balance sheets, extremely low or negative interest rates, and the preservation of low economic growth rates. Therefore, structural modernization remains relevant at the stage of recovery growth for all countries, including Russia.

3. The contradiction between simultaneously manifesting demand shocks and supply shocks [2]. Countering them requires the opposite measures. In the conditions of a demand shock, monetary stimulation ("helicopter money") is possible. In a situation of supply shock, cash injections become dangerous because they lead to stagflation. This is evidenced by the experience of the structural crisis of the 1970s. The pandemic crisis began as a supply crisis: businesses were shutting down because of border closures and lockdowns, not because of their inefficiency or the collapse of the banking and financial system. However, the supply shock was followed by a demand shock. This factor, combined with persistently low inflation and cheap debt, allowed the use of monetary stimulus tools. In such a contradictory situation, monetary policy should be cautious, taking into account possible inflationary risks.

The Governments of all developed and leading developing countries are spending significant funds to overcome the socio-economic consequences of the crisis.

These funds are used in three directions: to support the population (including in the form of direct payments to households and in the form of a moratorium on debt servicing), to save jobs and to help businesses.

There are several models (variants) of anti-crisis policy that are being implemented in modern countries. These models were formed taking into account the structure of the country's economy (including the share of the private sector and small businesses), the financial capabilities of the state, the effectiveness of monetary policy institutions, and the specifics of the country's economic and political development.

1. The market-regulated model of anti-crisis policy is practiced in most European countries with a stable socio-economic tradition, as well as in South Korea. Here, the anti-crisis policy is aimed at protecting jobs and current economic activity. The very possibility of implementing such a policy is based on strict control over budget expenditures and a high-quality institutional environment. In such countries, small and medium-sized businesses occupy a leading place, so financial support for people, employment and business largely coincide. The risk of such a model of anti-crisis policy is that excessive aid in the medium term may lead to stagnation of companies and inhibition of structural transformations.

2. The market-liberal model of anti-crisis policy is typical for countries such as the United States and the United Kingdom, where large companies dominate, usually do not need direct government support. The state's social spending, which reaches 15% of GDP here, is primarily aimed at helping people (households). Such countries face more serious short-term risks compared to countries using a market-regulated model, but they have more flexibility in ensuring economic dynamics in the long term [3].

3. The model of anti-crisis policy in developing countries. The financial resources that the state can painlessly attract from the market for social support of the population are very limited in these countries. As a rule, there is a fairly large informal (shadow) sector that plays an active role in ensuring socio-economic dynamics and political stability.

As for Russia, its anti-crisis policy cannot be attributed to any of these models. Due to the very low public debt, Russia has ample opportunities to use significant financial resources of the state for social assistance to the population. Since small and medium-sized businesses here account for a relatively small share in the economy, small amounts are required to support them, and the main social assistance is provided to families [4].

In the current situation, the question of the role and priorities of central banks is becoming increasingly important. There are several new approaches to its solution.

1. Many politicians support the thesis that the principle of independence of central banks should be abandoned. It should be noted that the functions and role

of monetary regulators throughout the history of their existence have been periodically reviewed taking into account changes in the sphere of monetary circulation.

2. In developed countries, the proposal to revise the principles of central banks' activities that developed after the crisis of the 1970s is gaining popularity. In particular, it is proposed to expand their functions: in addition to the current functions of ensuring monetary stability, economic growth and employment, central banks should take into account their impact on the state of the climate, as well as problems of social, racial and gender equality when making decisions. The fact is that the recent soft monetary policy pursued by regulators has, among the negative consequences, an increase in populism, political and social destabilization.

3. Central banks have started discussing the prospects of issuing their own electronic money. The latter are now associated not with private money (cryptocurrencies), which are an alternative to public money, but with fiat money. Transactions with fiat money do not require mediation by commercial banks, which undermines their business. Thus, a new type of competition has appeared in the money market – between central and commercial banks, which will largely determine the contours of the post-crisis system of developed countries [5].

The pandemic crisis has made it much more difficult to maintain a balance between anti-crisis measures and achieving medium- and long-term development goals of the country. Long-term goals essentially mean structural reforms. The problems and challenges that emerged in modern countries during the global crisis of 2008-2009, but are still waiting for their solution with the help of structural transformations, include: Secular stagnation (persistently low growth rates); inefficiency of monetary regulation; unprecedented high public debt and budget deficits in a number of leading countries; the crisis of global trade and growing inequality with a deepening gap between property and labor. Climate challenges are added to this.

The crown crisis has made its own adjustments to the agenda of structural reforms. The issues of healthcare modernization are currently in the focus of attention in all countries. The economic, political and social role of healthcare has increased so much that in the long term, this industry will actively influence the socio-economic policy of any country and its budget priorities. Another important structural consequence of the pandemic is a powerful impetus to the development of digitalization, which is becoming a key factor in structural modernization.

The global crisis of 2008-2009 and the new stage of technological development required a significant increase in the role of the state in regulating the economy. The pandemic has further intensified this trend [6, 7, 8].

The strengthening of state regulation currently observed in all countries is associated with a sharp increase in the uncertainty of technological and, consequently, socio-economic dynamics, primarily in the short term. This leads to increased risks when making investments (especially long ones) and introducing innova-

tions. In such conditions, it is no longer industries that have to be divided into advanced and backward, but technologies, and both advanced and outdated technologies can exist within each industry at the same time. In addition, unlike the XIX – XX centuries, radical changes in technologies and general living conditions do not occur from generation to generation, but within one generation. This greatly increases socio-economic instability, increases the risks of destabilization. It is the state that should compensate for this instability and minimize the risks that arise.

In this regard, the modern state should address two groups of tasks:

1. Maintaining investment activity.

2. Mitigation of socio-economic inequality, which increases as a result of the gap between income from property and from labor. The second task is more traditional for the state, and it has already joined in its solution. The first task is quite unusual for this institution and requires more detailed consideration. Its relevance is due to the fact that in developed countries the last decade has been characterized by a decrease in interest in private investment due to high technological uncertainty, which increases investment risks. As a result, in many countries there is a decrease in the share of investments in WFP compared to the share of savings, which objectively makes it difficult to maintain macroeconomic equilibrium. This problem can no longer be solved by improving the investment climate, because the origins of low propensity to invest are associated with increasing technological uncertainty.

The only way out is that the state should assume the function of "investor of last resort" [9,10,11]. Unlike the statistic models of the past, such a function of the state does not mean the redistribution of funds from private projects in favor of bureaucratic ones. There is a return of a model that is close to Keynesian. But at present, the state should not increase aggregate demand, but gross investment. Private business should follow the government. The choice is not between public and private investments, but between the presence of investments and their absence. Among the priority areas of state investments should be those sectors of the economy that increase factor productivity. This is primarily an investment in human capital and infrastructure (digital and transport). No less important is the quality of public administration. Investment tasks should be solved with the help of targeted borrowing mechanisms, and not by increasing taxes.

Over the past decade, there has been a slowdown in the process of globalization, which has manifested itself in a decline in the dynamics of world trade and foreign direct investment. The situation on the world market has also worsened as a result of the political and economic confrontation between the United States and China.

The coronavirus pandemic has created tough new barriers to globalization. The shutdown of production and the closure of the borders of the leading countries led to the rupture of established economic ties, the destruction of value chains,

complicated relations between traditional partners. In general, the pandemic has had a restraining effect on the development of globalization in several ways:

1. Direct restriction of the movement of goods, services and people between countries.

2. Strengthening measures for self-sufficiency of national economies, increasing their independence from foreign markets, especially in a number of critical positions. This does not mean a transition to autarky, but the level of openness of the economies has significantly decreased.

3. Increasing the role of narrow (non-global) economic partnerships – common markets, free trade zones. Traditional regional economic unions are going through a crisis, which can lead them both to renewal and destruction. For example, the fight against the pandemic has not become a pan-European matter within the EU, has not strengthened solidarity, but has prompted the participating countries to create certain reserves of security within their national borders.

4. Strengthening of the trend towards the development of regional integration, i.e. the formation of alliances of individual countries to solve various economic problems.

These centrifugal trends are not unambiguous and rigid. The strength of their manifestation will largely depend on the duration of the pandemic. The future contours of globalization are not yet clear, but the expert community is increasingly divided into critics of globalization and its defenders.

Conclusion

The crisis caused by the pandemic has caused complex and contradictory socio-economic processes, deep structural shifts in the economy and in all other spheres of society, which have serious long-term consequences.

Models of anti-crisis policy in modern countries differ significantly depending on many factors: the specifics of the economic and political development of the country, the ratio of large, medium and small businesses, the financial capabilities of the state, the effectiveness of monetary policy institutions.

The pandemic crisis has exacerbated and complicated the problem of maintaining a balance between anti-crisis measures and achieving medium- and long-term development goals of the countries of the world, has made significant adjustments to the understanding of the role and tasks of central banks.

Due to the sharp increase in technological and socio-economic uncertainty, the role of state regulation is now significantly increasing in all countries. The most important tasks of the state in a crisis are to maintain investment activity and mitigate socio-economic inequality.

The pandemic has created tough new barriers to globalization, strengthened trends in the global economy towards decentralization, regional integration, and a decrease in the openness of national economies.

Although the current crisis is neither cyclical nor structural in nature, it has exacerbated many problems that have not been resolved after the global structural crisis of 2008-2009. Therefore, to overcome the consequences of the coronacrisis, deep structural reforms postponed in the previous period will be required.

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DOI 10.34660/INF.2022.34.41.003

WIND-DOWN PLAN FOR UK FINANCIAL COMPANIES

Emelianova Ellina Sergeevna
Candidate of Economic Sciences, Senior Researcher, Scientific Laboratory "Research of the Monetary System and Analysis of Financial Markets" Plekhanov Russian University of Economics

Abstract. *The article discusses practical examples that can be used when preparing a winding-up plan by financial companies. The article will also be of interest to practicing risk managers modeling various crisis situations when conducting financial activities. Additionally, the theses described in the article may also be of interest to financial regulators for conducting supervisory activities.*

Keywords*: wind-down plan, the FCA, financial company.*

The FCA expects firms to have credible wind-down plans in place should the business need to be wound down [1]. This document sets out an example plan for winding down its business and cancelling its Part 4A permission, in the event the firm is required to cease its activities because the business is no longer viable.

The FCA provides guidance to assist firms with their wind-down planning. The FCA's Wind-Down Planning Guide ("WDPG") notes: "An effective wind-down plan aims to enable a firm to cease its regulated activities and achieve cancellation of its permission with minimal adverse impact on its clients, counterparties or the wider markets. This includes scenarios where the firm undertakes a strategic exit as well as unexpected crisis or insolvency that makes the firm unviable." [1]. "A wind-down plan can also help a firm to assess if it would have adequate resources (e.g., capital, liquidity, knowledge and manpower) to wind-down in an orderly manner, especially under challenging circumstances." [1].

The plan considers the type of events that could give rise to the firm winding down its regulated activities and the steps the firm would take during the wind-down process, including the resources (financial and non-financial) that would be needed, and estimates the costs of an orderly wind-down.

The wind-down plan is owned and approved by the governing body. It is periodically reviewed (at least annually or following a material change to the business or operating model) to ensure it remains current and relevant to company's operations.

At the beginning of the plan, the company's business model is described (figure 1).

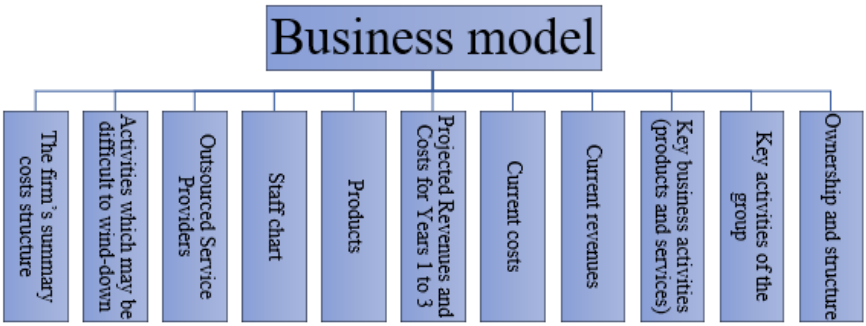

Figure 1. *Example of the content of the paragraph about the business plan*

The company would enter wind-down if the business were no longer viable, and no recovery options were available. The Company would be considered unviable if it no longer had adequate financial or non-financial resources to carry on its regulated activities and meet its regulatory requirements (e.g., the FCA's threshold conditions) or its contractual obligations.

The company should consider scenarios which would cause the business plan to become unviable. For example, these are:

(i) Significant market event: The scenario might arise in case of any extensive crisis in the major financial markets. Probability of the event happening is low.

(ii) Strategic decision to exit UK market: The scenario might arise in case of the Group's financial distress causing the strategic decision to limit its operations.

(iii) Collapse of the Trading System: The scenario might arise in case when our own platform collapses due to an external event leading to loss of significant amount of essential data. Probability of the event happening is low.

In the event the company were to become unviable, it would take the necessary steps to wind-down the business in an orderly manner. For the purposes of wind-down plan, the company can simulate a scenario where a market crash caused an average of 50% drop in stock prices leading to margin clients' default.

In the event of a severe stress, the governing body would decide whether the circumstances required a further injection of capital or liquidity, or other action to be taken, or whether to implement an orderly wind-down. By monitoring key management information, risk metrics and early warning indicators, the governing body would seek to implement a timely wind-down should it be necessary to do so.

Prior to reaching a wind-down decision, the company has potential options for recovery. Recovery actions include the list shown in Figure 2. It is not exhaustive.

Figure 2. *Example of Recovery actions before a wind-down decision*

The formal decision to wind-down is usually take by the governing body. The decision is taken after consultation with the Board of Directors. Prior to taking the decision to invoke the wind-down plan, the governing body considers the event or circumstances giving rise to the decision to wind-down, the recovery options implemented and whether there is any possibility of recovery. The governing body also considers what activities will cease upon wind-down, e.g., taking on new clients, and the financial and non-financial resources needed for an orderly wind-down.

Once the governing body has invoked the wind-down plan, the governing body will appoint a person(s) responsible for coordinating and implementing the wind-down process and inform the regulator of its decision to wind-down the company's regulated activities. The governing body will invoke its communications plan and appointment external specialists to assist with the wind-down, such as legal, regulatory and audit advisors.

Principle 11 FCA FG20/1 [1] requires companies to deal with regulators in an open and cooperative way and to disclose to the FCA anything relating to a firm of which the regulator would reasonably expect notice. Therefore, companies must

notify the ACE of any issues that threaten the ongoing viability of the company and any decision(s) to cease operations.

Companies are also assessing the impact of the winding down on its clients, its service providers and other counterparties, as well as on the broader market. The wind-down period describes the period from the time the governing body makes a formal decision to wind-down the company until the cancellation of the company's Part 4A [1] permission. During the wind-down period the company will most likely not take on any new clients and/or hire new staff, and/or undertake any marketing activities. An example of possible monthly actions during the wind-down period is shown in Figure 3.

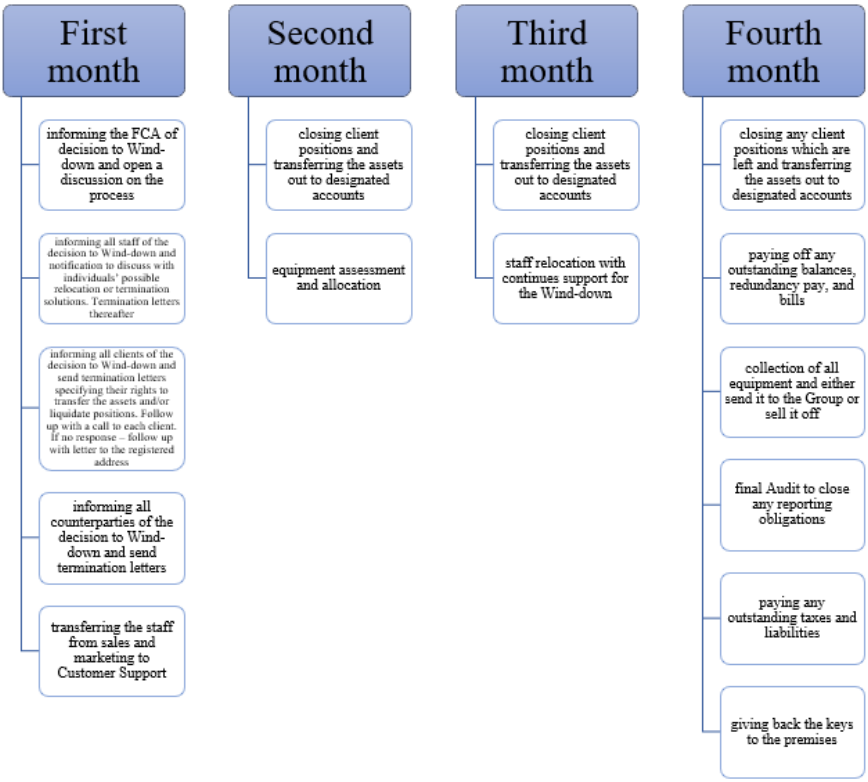

Figure 3. *An example of possible monthly actions during the wind-down period*

The governing body may appoint a Risk Manager and Executive Director to the role of coordinating and implementing the wind-down process, and who will be responsible for regular reporting to the governing body. The Risk Manager and

Executive Director can convene a Working Group. It is expected that the Head of Compliance, Head of Legal, CCO, and COO will form part of the Working Group.

The governing body and committees will continue to receive regular internal reports on the performance and risk management monitoring during the wind-down period. This includes monthly reports to the FCA the date of which will be agreed with the Regulator. Should any part of the management team leave abruptly, it will be substituted for equivalent from the Group. The departing management will deprive the Group's management and the coming management will continue with the reporting obligations as required. In addition, the governing body should receive regular updates from the Risk Manager and Executive Director and Working Group on progress with the wind-down process, including in relation to costs and any issues arising.

The company must continue to meet its external reporting obligations, such as client, regulatory, statutory and tax reporting. Before applying to cancel the Permission, the company must have:

- Stopped carrying out regulated activities or planned to stop carrying out regulated activities within 6 months of application
- Told clients and approved persons that the company is going to cancel the Permission
- Paid all outstanding regulatory fees
- Filed any regulatory returns that are due
- Resolved any complaints against the company
- Have suitable arrangements to deal with any complaints and liabilities that might arise.

The application to cancel the Permission should be made through Connect. The company should assign an individual who will be available as the point of contact for the application. Once the FCA has deemed the application complete, a case officer has six months in which to make a decision.

The FCA's WDPG is clear that firms have an obligation to continue to comply with threshold conditions and regulatory requirements during the wind-down period. Firms are expected to continue to comply with the principles, reporting requirements, financial resource requirements and other relevant requirements. Therefore, it is important that a decision by the governing body to wind-down the firm is made in a timely manner and that the firm has adequate financial and non-financial resources to wind-down in an orderly manner.

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DOI 10.34660/INF.2022.40.89.004

DIGITAL MODELS OF CONSULTING-ORGANIZATION OF MANAGEMENT IN A COMPANY

Tretyakov Oleg Vladimirovich
Candidate of Economic Sciences, Head of Department
Perm National Research Polytechnic University

Abstract. *The article analyzes the main segmental activities of a consultant invited by the head of the company to fundamentally correct the organization of management in the context of the transition to a digital format. The previous experience of management consulting has been rethought in modern, digital conditions for improving organizational management. Four interconnected digital models are presented that help to better understand the problems of a company's transition from one state to another. These models "visualize" the negotiation process with the customer, helping to quickly establish business contacts, as well as significantly reducing the time of the negotiation process.*

Keywords: *management relations, digital model, digital format, event scenario, problem fields, sociocentrism, psychocentrism, consulting developments, overorganized chaos.*

In the context of a crisis transition to a digital economy and digital management, the quality of management, which is created by the head of the company and his top managers, is of particular importance [1]. The crisis is overcome by those who, in the process of rethinking the situation, suddenly make an unexpected move, like a chess player who finds himself in a difficult situation [2,3,4]. This move gives him an advantage in the competitive environment. It is these situations that management consultants help to create if they turn out to be creative individuals and take responsibility for the implementation of the external and internal reorientation of the company [5].

It seems that the quality of management can be ensured if we keep in mind the development of its four main organizational and psychological components [6]:

- procedural management (everyday, constant regulation of the behavior of employees using special technologies);
- team management (organization of the work of managers in teams and through the development of teams);
- consulting management (development of scenario management options in a

company based on the use of various social technologies: business and role-playing games, trainings, seminars, experiments, methodological tools);

- management of persons (personal organization of management of the head of the company on the basis of his managerial credo and the developed managerial "I-position") [7].

Let us consider as an example the case when the quality of management in the company has changed especially after the crisis. By the same principle, consulting tracking of events in other companies is also possible. The following shows four digital segments A, B, C, D, in which the main events take place [8]. The event scenario in this case can be as follows (fig. 1).

In the *digital-segment "A"*, it is very important to direct the work of managerial "teams", firstly, to solving "butt" problems of departments, and secondly, to procedural monitoring of managerial situations, where three dangers always lurk: bureaucratization, arbitrariness and overorganized chaos.

This is what is very typical for the management of organizations in the transitional period in general, and for the management of Russian companies in particular. Management in this segment implies an increase in the coordination of the work of teams in an ascending line: from individual problem solving to their systemic understanding and resolution throughout the company. And here certain procedural technologies should be developed.

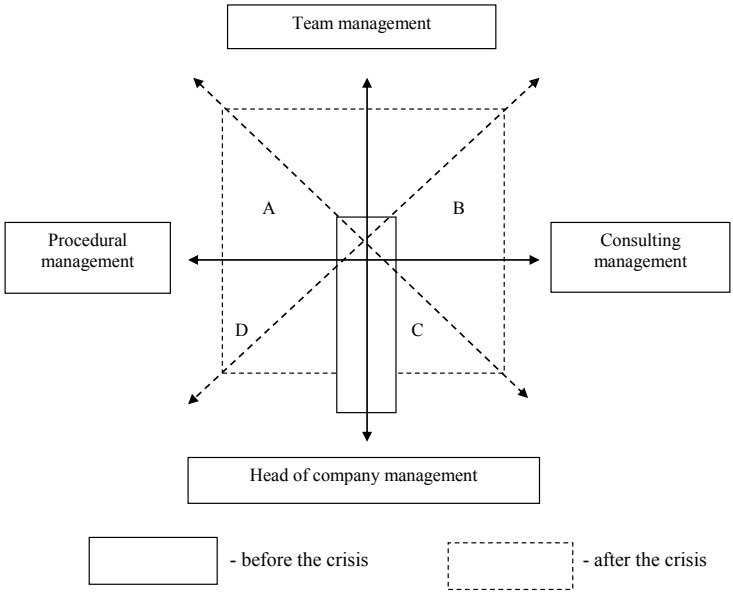

Figure 1. *Digital segments of management development in the company*

In the *digital-segment "B"* it is even more important to organize the work of such teams together with consultants. They have relevant learning scenarios that will help management teams work more efficiently. The inclusion of consultants in such teams or the analysis of certain management decisions, when the consultant plays the role of the Leader in games, makes it possible to obtain quick organizational and economic effects. On this basis, certain socio-psychological trainings are selected that consolidate and develop the primary results obtained. Consulting scenarios here may be different. One of them is: *"Lecture → Instruction → Game → Training → Effect"*.

In the *digital-segment "C",* such a community of consultants and the head of the company is even more important. After all, it is in this "local field" that new ideas are born, management plans are spoken out, trusting relationships are formed, conditions for joint work are determined and contracts are concluded. The main thing that is happening in this segment is the birth of a new management culture, as well as its modification. It is here that the head of the company tests all his ideas and developments, testing them for strength. It analyzes the management risks that arise both in making decisions and in their implementation, since consultants are taken, first of all, to help the head of the company assess the consequences of management decisions: immediate and distant.

This is the main value of consulting, because organizational development consultants make feedback transparent to the head of the company. Although this relationship does not always meet his expectations. The gap between the expectations of the head of the company and the results obtained can be both with a "plus" sign (did not expect the result to be positive) or with a "minus" sign (did not expect the result to be so negative). These fluctuations in expectations are the consulting minefield, which can explode if the result falls too short of expectations.

In the *digital-segment "D"* there is a very strong intra-role contradiction in the mind and behavior of the head of the company, where three basic roles (manager - owner - entrepreneur) and two acquired ones (leader - specialist) can collide. The head of the company must work out the organization of management, where it is very important to introduce the necessary procedures that organize the behavior of employees. But it turns out to be difficult for him to engage in operational management: the role of an entrepreneur drives him into an analysis of the company's market environment; the role of a specialist may not correspond to the business for which he undertook; the role of the leader may turn out to be illusory, since in fact he is perceived as a despot; the role of the manager can be interpreted by him as a direct command; and the role of the owner pushes him to use the profits at his own discretion, and to voluntaristic actions. Of course, all these roles depend both on the manifestation of individual personality traits and on the pressure of external factors, but it is very important for a consultant to know how intra-role contradictions of the head of the company can manifest themselves in order to understand

one or another of his actions.

All of these segments provide insights into consulting opportunities in four main business areas. They also help the consultant to recognize those typical "problem areas" that he has to face in the firm. It is desirable to combine such a "segmental" approach with a system-situational one, when it is important to solve all situations that arise in these segments based on a systemic vision of the state of affairs in the company. Only then, using the appropriate diagnostic techniques, the consultant can "build" his scenario micro-concept, that is, his intellectual product, for which he receives money from the Customer - the head of the company.

But there is one more aspect of the vision of "problem areas", which was "suggested" by management practice itself - the need to analyze the features of management in the pre-crisis period. This scenario approach is deployed in a time range and has two points of "difference" of events: on the border "what was - what changed" and on the other border "what changed - what has arisen again". The past, present and future in their comparison turns out to be the methodological key of the analysis. This was the basis for express surveys in study groups during periods of crisis in companies, that is, when these boundaries were already clear, and boundary problems were more clearly identified. By this time, many models of anti-crisis management appeared, which were based on various consulting scenarios. However, it was temporary models that were needed in order to understand how to more prominently designate a new problem field in organizational consulting: "From what they left and what they came to" (fig. 2).

The construction of such problematic fields can be represented graphically. This graphic image is a universal way of reflecting temporary contradictions in the company: between the growth of new problems and the unresolved problems of old ones, which are pulling the company towards bankruptcy.

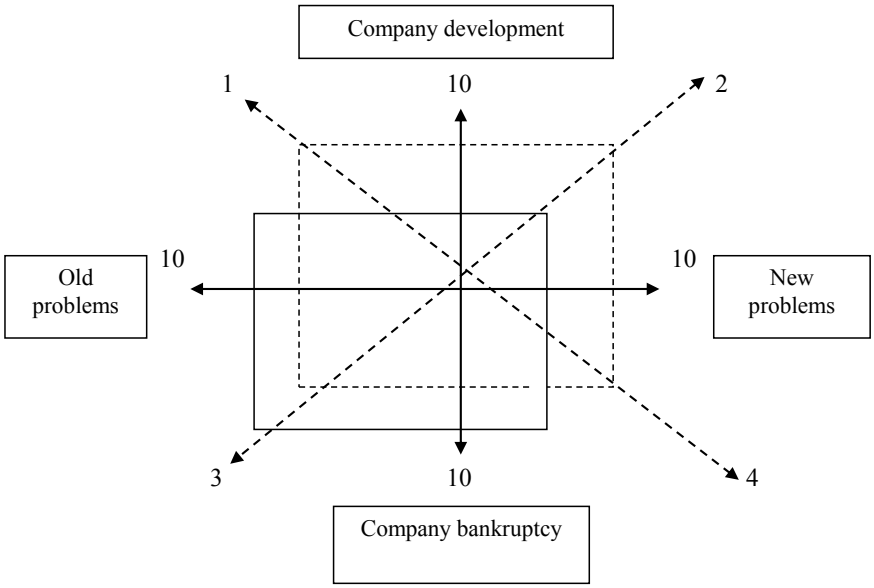

Figure 2. *Digital options for understanding problem fields in consulting*

The digital development of the company involves, first of all, overcoming old problems and solving new ones, which was recorded in segment 3 and segment 2. At the same time, the chance of a problematic rethinking is fraught with two threats: the risk that new problems that have arisen can pull the company to bankruptcy if they are not addressed; the risk that accumulated old problems, if not released, could bankrupt the company.

In consulting practice, one has to deal with four typical management approaches in solving all these problems. If we continue digital graphic modeling of emerging problems in firms, then these four approaches to their resolution can be represented on the coordinate axes as follows: innovation-economic; production and engineering; organizational and technological; socio-psychological (fig. 3).

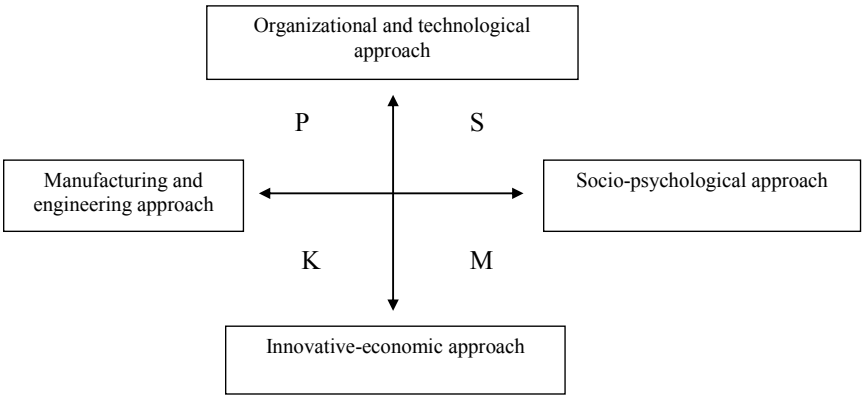

Figure 3. *Segmental digital model of management consulting*

The most significant management approach in resolving emerging problems is the M segment. It is provided by the marketing department. In this department, the positions of economists responsible for market research and the positions of psychologists studying the motives of consumer demand should be strong. But it often happens that economists are concentrated in the marketing department, who can professionally perform their functions, but unprofessionally take on the marketing functions of psychologists. When economists replace psychologists, the marketing department eats itself.

Consulting experience shows that marketing departments can be the weakest departments in companies. Therefore, it is important for a consultant to start working in a company from there: the company will develop only when the head and his top managers learn:

- to form marketing management concepts in all market segments;
- correlate marketing concepts with the intra-company management concept. This can be especially difficult to implement in large holdings that combine many heterogeneous companies.

The second most important segment for a consultant is the one that provides the company with new technologies (segment K). This is, as a rule, a design bureau where qualitatively new consumer products are developed. But it can work productively only when it has constant feedback from consumers through the marketing department. That is why the socio-psychological channels for collecting and "pumping" such information to the developers of the design bureau become a priority in the marketing department. It is in this segment that a particular level of understanding of consumer demand is formed, which also depends on the degree of competition in the market. It is this segment that ensures the company's competitiveness in the market and the life cycles of marketable products. Therefore,

management consultants must weigh the competitive opportunities of this segment in terms of time: "how it was, how it became, how it can be and how it should be." In this segment, it is important to combine multi-aspect consult diagnostics with multi-aspect forecasting: what the company can become in the near future and in the future.

The third most important segment for the consultant is the one where the direct production of products is carried out (segment P). It is in this segment that the struggle for quality unfolds. The director of production in this regard is responsible for ensuring the quality output of products, being responsible for the technology of its manufacture. He also expects from the design bureau positive solutions to emerging engineering problems in his division, and from the sales department - the successful sale of finished products. In this segment, the core of the company's corporate responsibility in the field of organizing the latest technologies for the marketing of marketable products is being laid.

The fourth most important segment for a consultant is the one where sales managers carry out sales by building dealer networks in the sales department (segment S). Tracking networks, they thereby regulate all trade, ultimately ensuring the turnover and profitability of the company, depending on the conditions on which they negotiate with wholesalers. But if dealer networks have several links ("large wholesaler - medium wholesaler - small wholesaler - buyer"), then they become poorly controlled. And then this gap should be filled by the marketing department.

The circular scenario for managing the process "Money - Commodity - Money" begins at the border of "S" and "M" segments. This is where the main critical point for the consultant arises. After all, the "S" segment turns out to be both the completion of this cycle and the beginning of it with the "start" of the "M" segment. It is important for a consultant to monitor this process, because it is on the border of these segments that there are very large reserves and reductions in the "M-C-M" cycle in time, and the organization of "point", that is, targeted sales.

It is important for consultants to track all four scenarios in a closed loop in order to understand where this loop can be broken and why. It is from these boundary "failures" that it is important to start consulting diagnostics. Not from the "human factor" of the company as a whole, but from the identification of those psychological and socio-psychological barriers that interfere with this particular cycle. First, it is important to understand what organizational and economic effects socio-psychological correction of managerial personnel can lead to.

However, it also happens when it is more important for consultants to determine the manageable and unmanaged zones in each segment (fig. 4). This can be done on the basis of organizational diagnostics of managerial problems based on specialized methods for each division of the company, for their "docking" with each other and isolating three types of problems:

- "root" (or deep-causal);

- the main ones, on the solution of which the solutions of all other problems also depend (Professor A.I. Prigozhin's method) [5];

- urgent, which must be addressed as soon as possible. It is important for consultants to orientate themselves in the typology of these problems, although it is often important for the customer to solve actual problems.

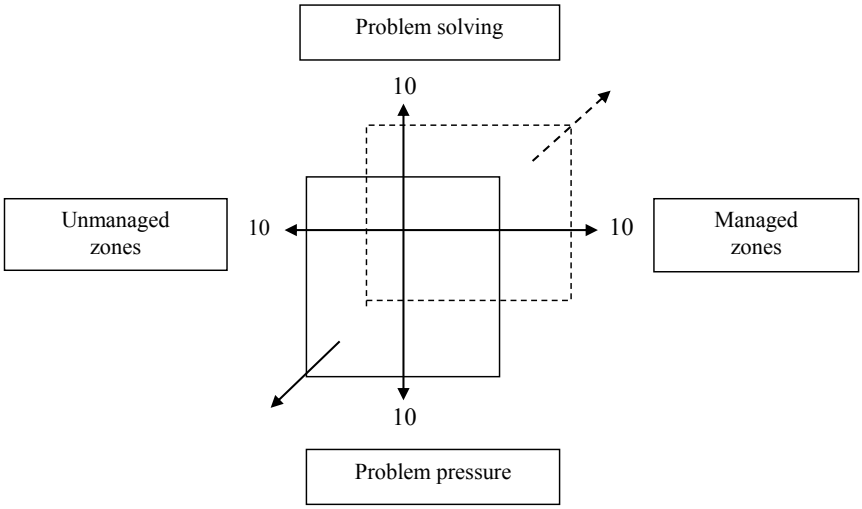

Figure 4. *Problem orientation of management is the main contradiction in a company*

The image of the "problem field" of the company in such an indicative digital model, where the lower quadrant is filled with problems, and the upper one suggests their solution, gives the consultants the opportunity to meet with the head of the company to discuss the likelihood of developing one or another organizational scenario in training consulting. It is training consulting in the form of seminars and short business games that, as a rule, helps to develop solutions to many problems of the transition to digital management and reduce their pressure on the head of the company and top managers. Such an approach may be of particular interest in the transitional period of digital governance. In such a consulting development, a new position is modeled - the director of digital development of the company, who must organize cooperation between a) departments and b) employees. It can be called CORS (course) (Crew – Operation - Risks - Stimuli).

A digital model of such a consulting development is shown in fig. 5. Its essence is to work out on computers the interaction of departments and personal workers

in solving new problems of the digital economy, i.e. provide a fundamentally new direction for the development of the company. Such consulting developments take into account Russian and regional features of the transition to digital transformation of companies, based on the American, European and Asian experience.

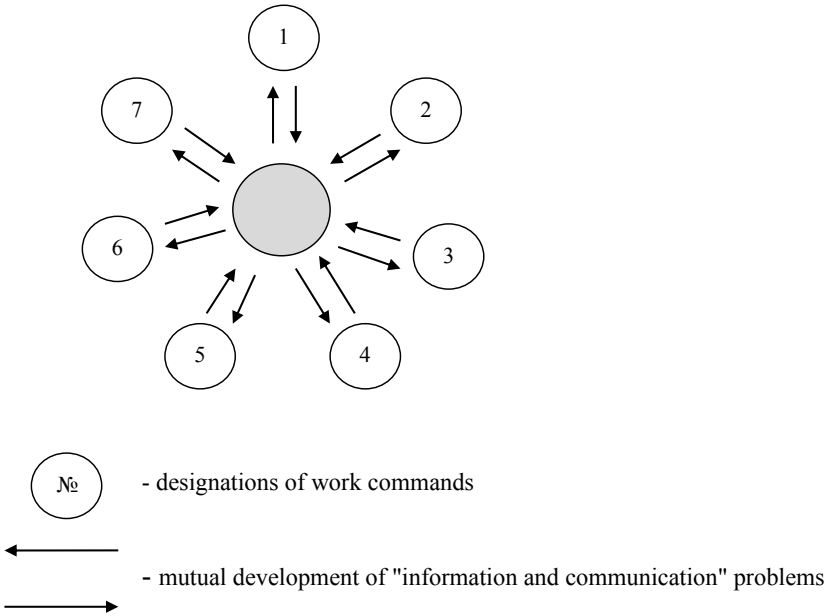

Figure 5. *Gaming digital-model "CORS"*

This initial consulting training "lays" the foundations for further development in such educational computer games that will help you choose an acceptable option for the initial entry into the complex system of the digital economy, digital technologies and digital management [9].

The analysis carried out allows us to draw the following conclusions.

Firstly, organizational consult diagnostics in a digital format makes it possible to visually assess the managerial capabilities of the head of the company, the director of digital development and top managers in cyclical time dynamics, starting from the production of commercial products and its sale on the market. The main thing in this methodology of management consulting is to identify the degree of competitiveness of the company "here and now", as well as in the future.

Secondly, visual-graphic digital-diagnostics of consultants in a visual form gives them the opportunity to assess the company's management fields in terms

of manageability and unmanageability. The main thing in this methodology is to isolate the root, main (key) and actual problems for their resolution in training consulting options.

Thirdly, the training organization of digital consulting training, aimed at identifying and eliminating unmanaged zones during crisis periods of a company's transition to digital format, is the main direction in management consulting. It becomes its further constructive continuation and turns out to be an interactive "learning by doing" consulting.

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DOI 10.34660/INF.2022.62.72.005

IMPORT AS AN OBJECT OF REGULATION OF THE VIETNAMESE PUBLIC ADMINISTRATION SECTOR

Pham Ngoc Van
Postgraduate
Plekhanov Russian University of Economics

Abstract. *The study presents the results of a comprehensive analysis of the volumes, dynamics and structure of Vietnam's import operations, which made it possible to form an information and analytical basis for the formation of an effective toolkit for state regulation. Such an approach is the key to successful implementation of the concept of sustainable development of foreign economic activity in the face of increased competition in the world markets for agricultural products.*

Keywords: *import, agricultural products, Vietnam.*

Introduction

The economies of all countries without exception are subject to permanent institutional transformations. Among the factors that have a significant impact on the ongoing processes, one can confidently name foreign trade. The effectiveness of export-import operations determines the vector of development of the economic, political and social life of the state. As a result, the volume and structure of imports is a priority object of regulation by the public administration sector.

Among the most effective tools to achieve the set goals in a minimum period of time, there are specific and ad valorem duties, quotas, "voluntary" export restrictions, the establishment of minimum import prices, technical barriers, etc. As a rule, states introduce import restrictions solely to create the most favorable conditions for domestic producers, who, for one reason or another, have less competitive advantages for the population than foreign ones. Separate elements of fiscal policy are actively used, for example, import taxes are introduced to increase budget revenues [1].

Countries make independent decisions on import volumes and its structure based on the type of trade policy being implemented, which, of course, must fully correlate with foreign and domestic policy directions, which is a platform for sustainable economic development.

Purpose of the study

The purpose of this study is a comprehensive analysis of the volume, dynamics, structure of imports of the state of Vietnam over the past few years in order to identify an effective tool for regulating foreign trade between countries.

Materials and methods

When forming the empirical basis of this study, official statistical data characterizing the dynamics and structure of Vietnamese agricultural imports, posted on the websites of the Asian Development Bank, Vietnamese customs, and the Ministry of Agriculture and Rural Development of Vietnam, were used.

The author applied synthesis, statistical, logical methods, as well as methods of comparison, generalization.

Results and discussion

Vietnam is historically an agrarian country, most of whose population is engaged in agricultural production. Export volumes are increasing annually, the range of exported goods and geographical directions is expanding. Thus, the export turnover of the entire agriculture, forestry and fisheries amounted to 48.6 billion US dollars in 2021, exceeding the value of the target by 4.6 billion US dollars [3,6].

At the same time, the import turnover of agricultural products also grew unprecedentedly. It is worth noting that data on imports of rice, cashews, peppers, etc. are recorded for the first time in the history of imports and exports of agricultural products in Vietnam:

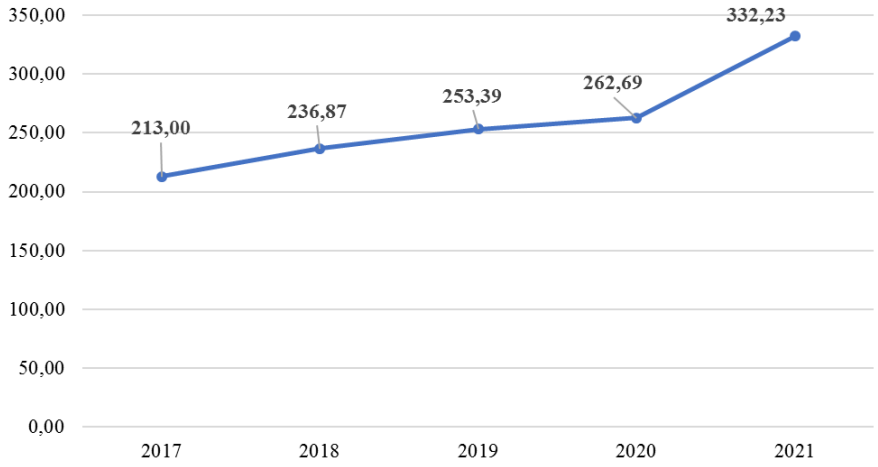

Figure 1. *Illustration of the dynamics of the total import turnover of Vietnam for the period 2017 – 2021, billion US dollars [5]*

The total import turnover of Vietnam for the period 2017-2021 increased by 119.23 billion US dollars from 213 to 332.23 billion US dollars, the growth rate is 155.98%. When comparing data by years within the indicated time period, the following growth rates can be noted: 111.21% (2018/2017), 106.97% (2019/2018), 103.67% (2020/2019), 126.47 % (2021/2020).

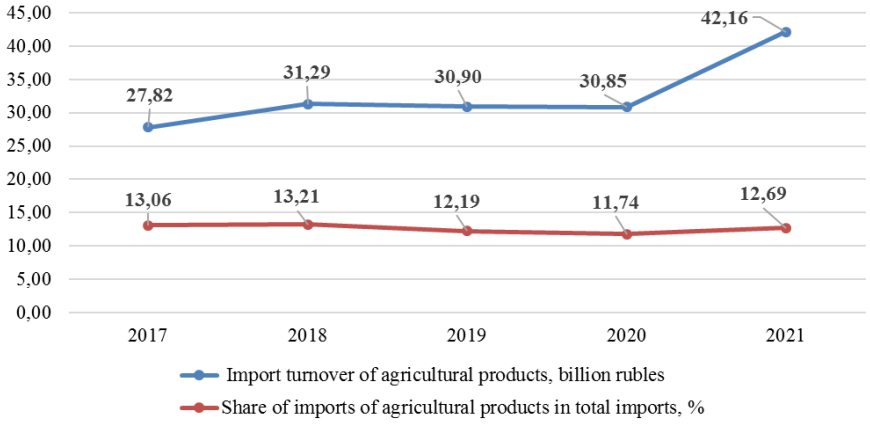

Figure 2. *Illustration of the dynamics of the import turnover of agricultural products in Vietnam for the period 2017-2021. [5,6]*

At the same time, the growth rates were:

Table 1.

Growth rate of import turnover of agricultural products of Vietnam in the period 2017-2021, %

Indicators/growth rates, %	2018/2017	2019/2018	2020/2019	2021/2020
The volume of imports of agricultural products	112.47	98.75	99.84	136.66
Share of imports of agricultural products in total imports of the country	101.14	92.32	96.30	108.06

Generally, Vietnam imports agricultural products such as aquatic products, milk and dairy products, vegetables and fruits, cashews, wheat, corn, soybeans, fertilizers, rubber, wood and wood products, etc.:

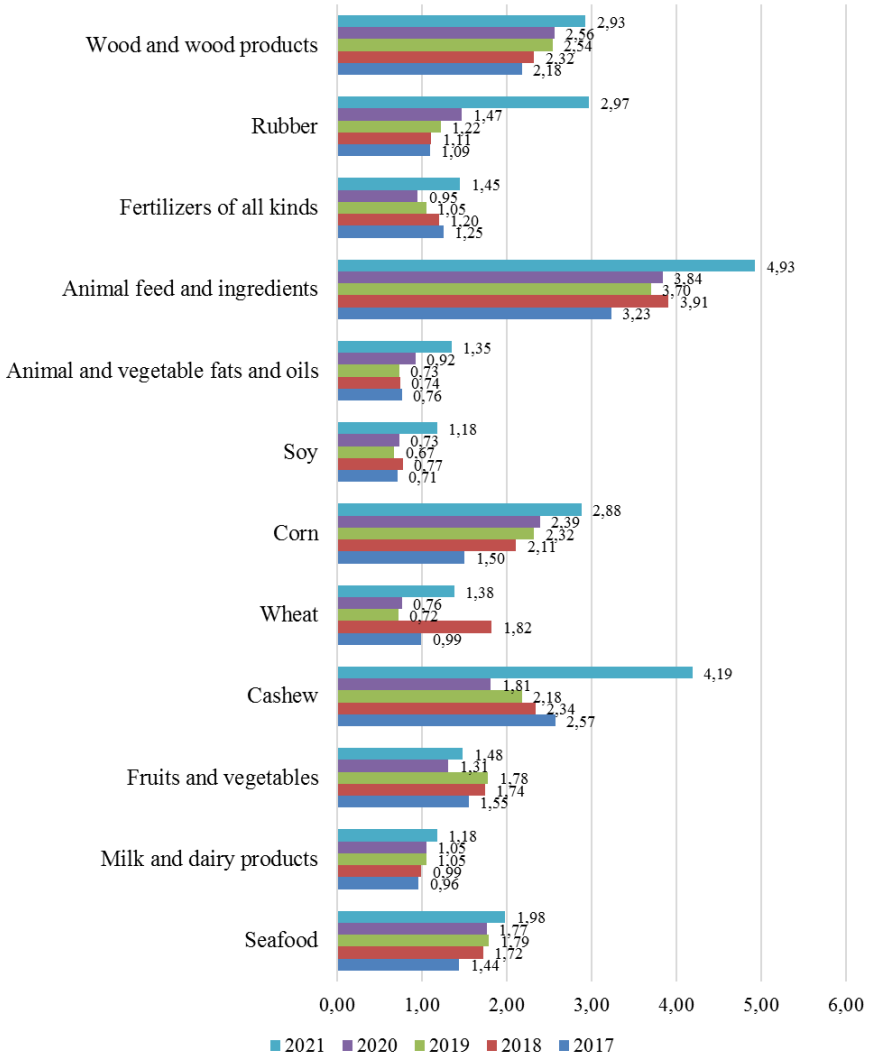

Figure 3. *The structure of imports of the main types of agricultural products of Vietnam for the period 2017 - 2021, billion US dollars [2,4]*

According to the report of the Ministry of Agriculture and Rural Development of Vietnam, the import turnover of agricultural, forestry and fish products in 2021 reached 42.16 billion US dollars, which is 36.6% more than in 2020. The average turnover from 2017 to 2021 Vietnam's agricultural imports reached 32.6 billion

US dollars. Summarizing the current trends, we can confidently say that the import turnover of agricultural, forestry and fisheries products increased to record levels, partly due to a sharp increase in world prices for raw materials for these products.

The growth rates of imports of the main types of agricultural products of Vietnam for the period 2017 - 2021 are presented in table 2:

Table 2.

The growth rate of import turnover of the main types of agricultural products in 2017-2021, %

Indicators/rates of growth, %	2018 /2017	2019 /2018	2020 /2019	2021 /2020
Seafood	119.44	104.07	98.88	111.86
Milk and dairy products	103.13	106.06	100.00	112.38
Fruits and vegetables	112.26	102.30	73.60	112.98
Cashew	91.05	93.16	83.03	231.49
Wheat	183.84	39.56	105.56	181.58
Corn	140.67	109.95	103.02	120.50
Soy	108.45	87.01	108.96	161.64
Animal and vegetable fats and oils	97.37	98.65	126.03	146.74
Animal feed and ingredients	121.05	94.63	103.78	128.39
Fertilizers of all kinds	96.00	87.50	90.48	152.63
Rubber	101.83	109.91	120.49	202.04
Wood and wood products	106.42	109.48	100.79	114.45

As for the product items imported by Vietnam, the leading positions are occupied by "animal feed and ingredients" (turnover increased from 3.23 in 2017 to 4.93 billion US dollars in 2021, growth rate of 152.63%), "cashew" (turnover increased from 2.57 in 2017 to 4.19 billion USD in 2021, growth rate 163.03%), "corn" (turnover increased from 1.50 in 2017 to 2.88 billion USD in 2021, growth rate 192%), "seafood" (turnover increased from 1.44 in 2017 to 1.98 billion US dollars in 2021, growth rate 137.5%).

Conclusion

As noted earlier, export-import operations are subject to the regulation of the government sector of countries, Vietnam is no exception. Export, attracting finance to the country, increases GDP. In turn, when purchasing imported goods, there is an outflow of funds from the economy, GDP decreases.

Countries tend to have more exports than imports in order to have a positive trade balance. For this, means of protection of domestic producers are used, and barriers to imports are set. Best practices show that the most effective are high tariffs (taxes or surcharges on imported goods) and strict rules about what goods can be imported.

A comprehensive analysis of Vietnam's import operations allows us to draw an unambiguous conclusion that the state prioritizes the implementation of a sustainable development strategy on a free trade platform not burdened with barriers. By preserving the right of domestic consumers to choose products, the basis for fruitful cooperation between countries is being formed, which strengthens the country's competitive advantages on the world stage.

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5. https://www1.customs.gov.vn (appeal date: 03.02.2022)

6. https://www.mard.gov.vn/Pages/default.aspx (appeal date: 24.01.2022)

DOI 10.34660/INF.2022.79.61.006

TO DISCUSS THE CONCEPT OF THE NATION STATE AND LAW IN THE PERIOD OF THEIR ADAPTATION TO THE PROCESSES OF WORLD GLOBALIZATION, SCIENTIFIC AND TECHNOLOGICAL PROGRESS, THE DEVELOPMENT OF ELECTRONIC TECHNOLOGIES, INFORMATION REVOLUTIONS AND DIGITALIZATION

Ovsepyan Zhanna Iosifovna
Doctor of Juridical Sciences, Full Professor, Head of the Department
Southern Federal University

Abstract. *The article analyzes scientific publications on the development of the concept of the essence and form of the nation state and its functions in the period of growing processes of globalization. The author's vision of the system of new state functions is formulated. An analysis was also carried out (in the context of identifying trends in the development of scientific thought) on issues devoted to the development of the concept of essence, form, legal force and territorial basis for the operation of the law of a nation state in the period of international globalization. Estimates are given of the trends in the development of the scientific doctrine of the modern state and law from the standpoint of a systematic method of their understanding, as well as taking into account the problematic issues of the relationship of the nation state with new international, transnational actors of interaction. In connection with the analysis of scientific works on the risks of fragmentation of domestic and international law and the possibilities of constitutional law in the systems of domestic and international law, the author's position is stated that the most effective way to counter the threats and risks of globalization is the constitutional law of the nation state, updated in the direction of expansion in the Constitution of a sovereign state features. It reflects the uniqueness and identity of this state, its history, original features of the people (peoples) of this state.*

Keywords: *globalization; on the concept of the future state and law in the era of globalization; functions of the state in the period of international globalization; relations between the state, transnational economic structures and IT companies; fragmentation of the law of the nation state in the period of international globalization; fragmentation of international law in the period of international globalization, machine-readable law.*

Statement of problems

The topic of the future state and law in the period of growing processes of globalization, the development of scientific and technological progress, the creation of new, electronic technologies of information revolutions and digitalization is the subject of active discussions of scientists and politicians in many countries of the world. Specialists draw attention to the aggravation of global crises and discuss the problems associated with the search for new development strategies. Developing the ideas of Academician V.S. Stepina, T.Ya. Khabrieva and N.N. Chernogor write about the preference for the implementation of "the scenario of a multipolar world, where, along with the values of technogenic civilization, some fragments of traditionalist mentalities that have been preserved and adapted to them appear ... creates great opportunities for evolutionary processes, stimulating the dialogue of cultures and the emergence of value orientations"[1]. The implementation of a unipolar world "according to V.S. Stepin, is fraught with adverse consequences for humanity"[2]. In accordance with the polycentric version of the globalization strategy, "strengthening the systemic connection of countries implies the preservation of their state sovereignty and the development of agreements regarding certain necessary adjustments to international law. The second strategy is aimed at spreading the established legal norms of the leader of globalization to all regions of the planet"[3]. According to Academician of the Russian Academy of Sciences T. Ya Khabriyeva, Russian academic world believes that at present "the transition from a mono-civilizational to a multi-civilizational model of the world order" has "already taken place"[4].

The transition to a multipolar world, however, does not mean the end of the globalization processes of modernity for the reason that it is motivated by the expansion of international, foreign economic activity (primarily international trade). As A.Yu. Melville: "The formation of the transnational environment of world politics, which is largely under the influence of globalization, is now taking various shapes"[5]. Among them, the author names, in particular: "fixing de facto (partly already de jure) as legitimate participants in international relations non-state and supra-state actors with their own specific interests and positions - from transnational corporations (TNCs), non-governmental organizations (NGOs)) and international

[1]Stepin V.S. Modern civilizational crises and the problem of new development strategies. M. 2018. P. 21; Khabrieva T. Ya, Chernogor N.N. The future of law. The legacy of Academician V.S. Stepina and legal science. M. INFRA-M. 2020. P. 51.

[2]Stepin V.S. Indic. work. Ibid; Khabrieva T. Ya, Chernogor N.N. Indic. work. Ibid.

[3]Stepin V.S. Indic. work. Ibid; Khabrieva T. Ya, Chernogor N.N. Indic. work. P. 52.

[4]Stepin V.S. Indic. work. Ibid; Khabrieva T. Ya, Chernogor N.N. Indic. work. Ibid.

[5]Melville A.Yu. Formation of the transnational political environment and the "wave" of democratization / A. Yu. Melville / / Modern international relations and world politics: Textbook for universities / ed.-in-chief A.V. Torkunov; MGIMO(U) MFA of Russia. – M.: Prosveshcheniye, 2004. – P. 106-142.

non-governmental organizations (INGOs) to social and political and other movements, some interest groups, even individuals"[6]. Characterizing the features of the process of globalization in the period from the end of the XIX century. experts note: "On the one hand, in the course of integration processes, states transfer a number of their functions to supranational bodies. On the other hand, these processes are only a reflection of the growing power of transnational economic structures, the influence of which exceeds the influence of any single state department, "including for the reason that:" transnational corporations, creating their own security and intelligence services, are turning not just into centers of economic influence, but to a certain extent in the centers of power. The interests of the social groups associated with them no longer coincide with the interests of any state at all".[7]

In view of the foregoing, in our opinion, it is relevant to discuss the issue of a new concept of relations between the state and transnational business, the relationship of the state with the key actors of international relations - transnational economic corporations, IT companies and, accordingly, it is relevant to discuss the novelties of the concept of forms (sources) and the content of the legal regulation of the relevant relations.

On the development of the concept of the essence and form of the nation state and its functions in the period of international globalization. In the scientific publication, there are different opinions about methodological approaches to understanding the concept of the future state and law: some authors (few) talk about the danger of the collapse of states as a form of public organization, others about the reduction of the state presence in the system of regulators of public relations ("about a significant reduction in the role of the state in the life of man and society"), many authors raise the topic - the need for a new concept of the functions of the state, non-c. etc. Interesting judgments about the concept of the state in the system of other forms of human existence are expressed by A.L. Panishchev. Carrying out the correlation of the concepts of "state" - "scientific and technological development" - "civilization" - "culture", the author formulates the following understanding of the concept of the essence and form of the state of the period of international globalization. So, in his opinion, based on the systematization of scientific publications:

1) "The theme of statehood as a form and way of being of a person and society has an anthropological meaning"[8]; "social and legal antagonisms can call into question the very existence of the state, and against the background of the lack of a clear concept of non-state development of mankind"[9].

[6]Melville A.Yu. Indic. work. Ibid

[7]Kortunov S. Formation of a new world order and problems of international security.

[8]Panishchev A.L. The future of the state as a form and way of human existence: prospects and contradictions. State and Law, 2021, No. 12, p.62

[9]Panishchev A.L. The archetype of statehood in the nature of man and society// State and Law, 2021, No. 1, p. 143

2) “The term “civilization” refers to that stage of social life, which is characterized by the presence of the state”[10]; it is legitimate to associate the genesis of civilization with the emergence of statehood”[11]; “statehood is the essence of civilization ... not every society is able to build a state; for national, i.e. state formation requires a high level of development of public consciousness, understanding by the people of common values, norms and goals of their joint existence”[12]; “the construction of a state is impossible if the people’s consciousness is not able to reject the usual form of community life and, moreover, imagine a new, yet unseen…”[13].

3) There is revenge "the dependence of civilization on culture, separation from which is fraught with the emasculation of law and the collapse of the state"[14]; “In recent decades, there has been a trend towards a decrease in the role of the state in the life of society and its displacement by transnational and clan corporations”. However, “an alternative to the state of a full-fledged path of civilizational development for this period of time has not been identified”. “At this period of the historical development of mankind, there is no more effective form of human existence than the state, within which social forces can so quickly and effectively mobilize and achieve their goals. Undoubtedly, the functioning of any state is unthinkable outside of culture. However, the existence of culture and people in isolation from the state seems unlikely. It is the state that is called upon to ensure the protection of culture, which is at the same time an expression of the state’s concern for itself, since without culture it is doomed to degeneration and decay.” The threat of the collapse of the state as a form and way of being of human society leaves national cultures and human nature itself unprotected. Therefore, it is necessary to strengthen and develop that way of anthropological being that already exists, but at the same time experiencing crisis phenomena of a cultural and anthropological nature”[15].

4) In his study, A.L. Panishchev comes to the conclusion that it is necessary for the state to preserve its "spiritual content". The author writes: “The state's loss of spiritual content alienates it from the norms of human existence. This circumstance leads to a gap between human nature, which gave rise to the state, and the state itself, which has ceased to effectively protect anthropological properties. Due to such circumstances, multilateral studies of the possibilities of a person's social existence outside the state, as well as the possibilities of preserving statehood as a

[10]Panishchev A.L. The future of the state as a form and way of human existence: prospects and contradictions. Ibid

[11]Panishchev A.L. The future of the state..P..62

[12]Panishchev A.L. The archetype of statehood in the nature of man and society// State and Law, 2021, No. 1, p. 145

[13]Panishchev A.L. The future of the state..P..62

[14]Panishchev A.L. The future of the state... Ibid

[15]Panishchev A.L. The archetype of statehood in the nature of man and society// State and Law, 2021, No. 1, p. 144 (143–148)

form and method of anthropological existence, are necessary"[16].

5) A.L. Panishchev should be supported and that important characteristics of the state of the period of international globalization is also its effectiveness in terms of combating corruption.

6) The author notes, following other modern researchers, the importance of states "as the main functional units in the dynamics of international relations."

In order to discuss the problem of a new concept of the system of state functions in the period of world globalization, information revolutions, the development of electronic technologies and digitalization, I would like to state the following vision of their list.

1) First of all, taking into account the fact that scientific and technological progress, which is of tremendous importance for the successful social and economic development of the modern world, is becoming the locomotive of the history of mankind, the state function associated with management and control in the field of education and science. The cooperation between the state and business in this area, the constitutional and legal regulation (the constitution of the nation state) of social obligations and responsibilities of all actors in international economic relations who have citizenship of the nation state are relevant.

2) In connection with the constantly expanding flow of information, the state management of the so-called "big data" is of great importance. Hence, there is a high demand for a new state function of the same name, in the successful implementation of which the cooperation of the state with companies engaged in the field of IT technologies is of great importance. In this context, it is organizationally expedient to single out (isolation) such a sphere of managerial influence as the "digital economy".

3) In connection with the expansion of access for each person in the field of electronic information communications and freedoms in this area, the state function of ensuring state security, law and order and protecting fundamental rights and freedoms is acquiring new dimensions: not only in the offline sphere, but also in the electronic space, anti-terrorism function.

4) In connection with the expansion of people's livelihoods in the electronic network, a new direction in the law-making activities of the state is emerging, related to the regulation of legal relations arising on the basis of information and communication (electronic communication) technologies. The implementation of this state function involves the involvement of the state (its legislative and executive authorities) of the Internet community in the process of lawmaking; state control of the possibilities and limits of participation of Internet technology specialists in the process of lawmaking.

5) The core value in the system of functions of the national state in the period of globalization is acquired by such a direction of the state's activity as ensuring

[16]Panishchev A.L. Indic. article. P. 65

the supremacy, the highest legal force of the Constitution of the state as a political and legal act proclaiming the sovereignty of the state. In the period of international globalization, the role of domestic courts (primarily constitutional courts) in the sphere of constitutional normative control is increasing. There is a trend towards the development of "external" functions of the constitutional court of the nation state as a "conductor" of international law in the domestic legal space and executor of decisions of international courts in the legal space of the nation state.

On the development of the concept of essence, form, legal force and territorial basis of the operation of the law of the nation state in the period of international globalization. On the growing role of constitutional law in the systems of domestic and international law. In the period of growing processes of globalization, the development of scientific and technological progress, the creation of new, electronic technologies, information revolutions and digitalization, the subject of active discussion in many countries of the world is the topic of the future not only of the national state, but also of the law it creates. The processes of globalization and regionalization seriously affect the understanding of the essence of law, pose threats and risks to the operation of the principle of the unity of legal spaces in the practice of many states of the modern world, including Russia. So, the question of the nature of such a “brainchild” of technological progress as “machine-readable law” needs to be discussed (and, in our opinion, at the academic level): is it a law at all, or a “surrogate of law”? After all, it is even called "machine-readable"! Although, undoubtedly, this is a useful creation, this is a colossal progress, but, in our opinion, it can obviously be considered a right only after its approval by a competent (constitutionally or legislatively defined) subject of rule-making, as well as law-making, capable of bearing responsibility in the event of large-scale the negative consequences of the relevant law-making, that is, to be capable of delinquency. In addition, in matters of rule-making through machine-readable law, it is important to comply with the requirements of the law of a constitutional state. The so-called “machine-readable law” proposed for its establishment and the regulators created through such “machine-readable law” must first of all comply with the Constitution as the fundamental law of the state, other national laws, as well as decrees of the head of state elected in national elections (as having the status of a representative institution); decisions of the Government of the Russian Federation adopted on the basis of national laws and decrees of the head of state. In addition, machine-readable law should not contradict the decisions of the highest courts of the nation-state.

As for the operation of the principle of the unity of the legal space, as Russian scientists N.N. Chernogor and A.S. Emelyanov, bearing in mind the difficulty of ensuring the unity of the legal space of Russia in connection with the expansion of globalization processes: “Today they (these processes - italic type) are based on the concept of an “open society”, which is based on international trade, entailing the

erosion of national legal spaces[17], the revival of the seemingly long-forgotten idea of "Lex mercatoria" (from Latin "common commercial law")[18]. The absence of real transsubject ties may lead to the inclusion of border areas in the zones of influence of foreign states and transnational corporations. In fact, if such a process develops, then the "crumbling" of the legal space of the Russian Federation will begin. Separate municipalities, and perhaps even regions, without separating from Russia de jure, will de facto find themselves in a different legal space, on their territory the laws of other states or trade customs will prevail. We emphasize that this threat is not a specifically Russian phenomenon. In the context of globalization and regionalization, almost all countries of the world face it. The United States, Western Europe, and China are no exception. Some foreign researchers designate it as a fragmentation of law[19], noting that national legislation becomes a "castle of sand", washed away by supranational or transnational regulation[20]. The growing practice of international e-commerce is an intrusion into the fiscal sovereignty of the nation state.

In the Russian scientific literature, the opinion is expressed that the problem of “fragmentation of law could be solved on the basis of international legal and (or) state legal regulation of the information space. Thus, V. B. Naumov draws attention to the fact that the problem of the jurisdiction of the information space is unresolved; about using the possibilities of information law. He writes that both the international community and the Russian legislator: “This branch of law is underestimated at the present stage of development of legal science. Branches of law were not ready for technological globalization, which led to a conflict of jurisdictions. Russian legislation and international treaties on the use of the Internet are still not coordinated, and it is not worth expecting that this will happen in the current geopolitical conditions .... As a result, in Russia and in any developed state, law enforcement faced with questions about which state laws apply to information legal relations that "begin" on the territory of one, and "end" on the territory of another. The unresolved problem of the jurisdiction of the information space leads to a “race of laws”, when states begin to extend their own laws to any information legal relationship where there is a national element, for example, a resident of the

[17]Bazedov Yu. The Law of Open Societies - Private and State Regulation of International Relations: General Course of Private International Law. M., 2016; Chernogor N.N., Yemelyanov A.S. Spatial and legal matrix of modern Russia // "Journal of Russian Law", 2020, N 5. P. 16-17.

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[19]Smits J. The Complexity of Transnational Law: Coherence and Fragmentation of Private Law. URL: https://www.ejcl.org/143/art143-14.pdf/ (date of access: 09.12.2019); Chernogor N.N., Yemelyanov A.S. Spatial and legal matrix of modern Russia // "Journal of Russian Law", 2020, N 5. P 16-17.

[20]Boom W. van. Algemene en bijzondere regelingen in het vermogensrech // Rechtsgeleerd Magazijn Themis. 2003. Vol. 164. P. 299; Chernogor N.N., Yemelyanov A.S. Spatial and legal matrix of modern Russia // "Journal of Russian Law", 2020, N 5. P 16-17.

country to whom information can be targeted, or the placement of an information server within the borders of the state"[21].

It is interesting to note that the topic of fragmentation of not only the law of the nation-state, but also the fragmentation of international law is discussed in science. So, in the scientific publications of the authors: R.A. Kolodkin, K.L Chaika, devoted to the study of the international legal aspect of globalization, it is noted that "fragmentation is inherent in international law from the very beginning of its formation, due not least to factors such as the lack of a single legislative body, the presence of disparate legal regimes, the development and the rapid growth of the normative content of individual branches (such as, for example, economic and humanitarian law), the parallel and competing regulation of homogeneous relations"[22]. In this regard, the scientific literature suggests the constitutionalization of international law as a way to resist its fragmentation. At the same time, some authors talk about constitutionalization on a global scale, while others limit proposals for constitutionalization to the space of regional international associations (more often, based on an analysis of EU practice)[23]. The foregoing indicates that in the period of globalization, the competition of national, supranational and transnational legal orders is intensifying. Therefore, as T.Ya Khabrieva and N.N. Chernogor: more and more often, the judiciary of modern states strives to uphold fundamental principles (constitutional values), "national identities of member states", "which should be respected", "original concepts of proportionality of universal and national values appear", as evidenced by the extensive practice of updating national constitutions"[24]. In the Russian Federation, among the measures related to updating the Constitution of the Russian Federation was the adoption of the Law on Amendments to the Constitution of the Russian Federation (dated March 14, 2020). Along with the 2020 amendments the Constitution of the Russian Federation introduced norms and principles that reflect specific features of the national (state-legal) and national-cultural identity of the multinational people of the Russian Federation, the identity of the history of the peoples of Russia, [25] formulated as norms about its political, historical, legal and cultural unity, which is relevant for the constitution of national state, taking into account the challenges and risks of increasing international globalization.

[21]Naumov V. B. Law in the era of digital transformation: in search of solutions// Russian Law. Education practice science. Theme of the issue: law and information technologies. 2018. №6. P.5.

[22]Kolodkin R.A. Fragmentation of International Law// Moscow Journal of International Law. 2005.№2. P.44; Quoted from the article: Chaika K.L. Global Constitutionalism or Constitutionalization of the Law of Integration Associations?// State and Law, 2020, No. 3, p. 142–151.

[23]Chaika K.L. Global constitutionalism or constitutionalization of the right of integration associations? / P.142-151

[24]Khabrieva T. Ya, Chernogor N.N. The future of law. The legacy of Academician V.S. Stepina and legal science. P. 53-54.

[25]See about this: Karpenko K.V. Constitutional originality and the spirit of the constitution. State and Law. 2020. N3 p. 70-81

DOI 10.34660/INF.2022.33.84.007

PROVIDING EVIDENCE TO PROTECT THE RIGHTS AND LEGITIMATE INTERESTS OF THE SHIPOWNER

Litvin Tatyana Aleksadrovna
Associate Professor
Shtyrkhunova Natalya Aleksandrovna
Candidate of Philological Sciences, Associate Professor
Fishkova Larisa Borisovna
Candidate of Philological Sciences, Associate Professor
Admiral Ushakov State Maritime University (Novorossiysk)

Annotation. *The legal significance of a Sea Protest as one of the independent ways to provide evidence is analyzed in the paper. The grounds making it possible to commit it are considered. The appropriate examples from courts practice in the Russian Federation are given.*

Keywords: *Sea Protest, statement of Sea Protest, maritime law, drawing up an act of Sea Protest, master of a ship, notary.*

Introduction

The rapid development of merchant shipping industry has inevitably resulted in the establishment and further improvement of various methods for protecting both the interests of the shipowner and the interests of the owner of the goods transported be sea.

When concluding contracts for the carriage of goods, taking into account the hazards and risks which may be encountered by ship during the voyage, shipowners specify in advance the cases in which the carrier shall be relieved of liability for any loss or damage to the goods carried by him. However, the contract terms do not in themselves exempt from the obligation to indemnify the owner of the goods against all losses or damages. This exemption comes into force only after the master of the ship has provided facts ascertaining that the conditions and circumstances having been stipulated in the contract actually took place during the voyage. The information given by the witnesses and the entries from the ship's logbook having been produced by the master in the form of letters addressed to the owner of the goods is recognized as such evidence. The latter can either admit that the shipowner is not guilty of causing damage to the cargo and therefore not

to demand the recovery of the losses or refute the facts presented by the carrier and prove the fault of the carrier with the subsequent recovery of the losses incurred by the owner of the goods.

Over many years it has developed the practice in the merchant shipping according to which the master of a ship informs the interested parties about the events occurred during the voyage which having been beyond the carrier's control but entailed the loss or damage of cargo. This custom becomes to be reflected in legal norms. Due to the rapid development of the trade as well as the relevant maritime laws, the rule of Sea Protest has been introduced in the national codes and laws.

Results and discussion

The legal significance of a Sea Protest and its role in protecting the interests of the shipowner is defined in the provisions of Article 394 of the Merchant Shipping Code (MSC) of the Russian Federation: "if while sailing or laying at anchor/alongside the berth any occurrence takes place which may be a reason for submitting a claim against the carrier, the shipmaster is to draw up a Statement of Sea Protest in order to secure evidence. The Sea Protest aims to provide, as far as possible, complete information regarding the circumstances and conditions causing an incident, including information of the scope of damage and the measures taken to prevent the incident or mitigate the adverse consequences resulting from it."

A Sea Protest takes a special place among the forms and methods of protecting the rights and legal interests of a shipowner. According to the established practice the declaration and submission of Sea Protest in the Russian Federation is regulated by the norms of the both maritime and notarial legislation, the latter not only establishes the procedure for performing a notarial act but also determines the purpose and legal nature of the protest, the consequences and the legal significance of such a protest. The above said issues are complex and subject to not only notarial, but also to maritime law.

The Sea Protest is an independent way of perpetuating evidence and aims to confirm the facts of legal significance in the court or arbitration proceedings related to disputes arisen in the merchant shipping. The court has the right to provide evidence but only in the case accepted for its proceedings [1]. The arbitration which has accepted the case for its proceedings, can also provide evidence at the request of the party concerned [2]. The evidence necessary in the event of bringing proceeding before the court (but which is not yet in court proceedings) may also be perpetuated by a notary at the request of the interested party [3].

The Sea Protest is of great importance in the distribution of losses in case of a general average. For the adjuster, a Sea Protest is one of the main documents on the basis of which the distribution of losses attributable to general or partial average is made, and the general average is declared [4].

Most often, a Statement of Sea Protest is made up when transporting cargo. According to paragraph 1 of Article 166 of the MSC, the carrier is not responsible

for the cargo if he is able to prove that the loss, damage or delay in the delivery has occurred due to the circumstances specified in this paragraph. Such loss, damage or delay in delivery of the cargo may occur due to force majeure, hazards at sea, actions taken to save human life or property, fire, act of war, collision with another ship, grounding, etc. When in the port a ship may be detained or arrested, or entry into the port may be prohibited owing to quarantine, epidemic, restraint of authorities, etc. By declaring the Sea Protest the carrier thereby transfers to the plaintiff the burden of proving the carrier's fault in case of loss, damage or delay in delivery.

However, the Sea Protest does not transfer the burden of proving the carrier's fault for the loss of the cargo to the recipient, if the Sea Protest does not contain information indicating the likelihood of specific adverse consequences that turned out to be the subject of the dispute. In case No. A53-41126/2018, the Court of Appeal disagreed with the conclusion of the first instance court that there were force majeure circumstances in the case that would release the carrier from liability [5]. It is explained in the Clause 4 of the Information Letter of the Presidium of the Supreme Arbitration Court of the Russian Federation dated 13.08.2004 No. 81 "Review of the practice of the application of the Merchant Shipping Code of the Russian Federation by arbitration courts" that the fact of a storm in itself does not mean the existence of a causal relationship between the storm and the loss of cargo. The fact of unfavourable weather conditions specified as a "sudden change in wind strength" is not an unconditional and substantial proof for declaring the defendant innocent of causing harm, since storm conditions in themselves cannot be considered as force majeure and the defendant retains the right for taking the appropriate safety measures to safeguard the ship, property, cargo etc.

The court practice in maritime claims has shown that most judgements have been made by a court or arbitration based on data comprised in Sea Protests and ship logbooks. When drawing up a statement of a sea protest in a notarial, officially established order, those events, facts, circumstances that accompanied the occurrence are recorded as legal facts that trigger obligations arising out of causing harm. When performing notarial actions, the reliability of the data specified by the captain of the ship in the statement of Sea Protest is verified by comparing them with the entries in the logbook, as well as with the testimony of witnesses – members of the crew of the corresponding ship.

Analyzing the courts practice on maritime disputes, it should be noted the resolution of the Fifth Arbitration Court of Appeal dated November 28, 2008 No. 05AP-1196 in case A24-1984/2008 with regard of the compensation for damage resulting from the loss and damage to cargo which occurred during sea transportation as per the contract… During the transportation of the cargo a part of the cargo was lost. According to the inspection report it was found that there was a shifting of the metal cargo fixed with steel wires in the area of the stern. As a re-

sult of cutting off the steel wires a part of the metal fell overboard tearing off the railing. The court concluded that the plaintiff proved the damage incurred by him and the defendant was to recover in full the losses incurred by the plaintiff. The court did not take into account the documentary evidence of bad weather conditions as evidence of force majeure exempting the defendant for damage caused to the plaintiff's property during the carriage by sea, since in the case there was no properly drawn up Sea Protest indicating the fact of storm that should have been lodged by the master of the ship.

By the decision of the Federal Arbitration Court of the Far Eastern District dated February 19, 2013 FO3-177/2013, the claim submitted to Sakhalin Shipping Company was satisfied in full. Opposing the claim, the defendant referred to the fact that the cause of damage to the cargo during transportation was force majeure and it was recorded by the master of the ship in Sea Protest. According to the provisions of Article 71 of the Arbitration Code of Practice of the Russian Federation, having evaluated the available evidence in the case with regard of their totality and interrelation, including extracts from the ship's logbook, documentary evidence of stormy days in the Tatar Strait, the courts concluded that the defendant had not proved that, with the due diligence and care exercised by him, the said marine accident could not have been prevented. At the same time the courts took into account that when entering the port of Kholmsk the master of the ship was aware of unfavourable sea and weather conditions in the area and of the impending deterioration of the weather. As the courts established this is also confirmed by data indicated in the Act of Sea Protest 27 AA N 0296061 which states that having left the Sov Gavan Bay at 00.37 hours on January 6, 2012, the ship already encountered stormy weather, experiencing heavy rolling.

The legislation establishes two stages of making of a Sea Protest: a statement of Sea Protest lodged by the master of a ship and an act of Sea Protest drawn up by the representatives of official bodies. In Russian ports a statement of Sea Protest is to be made to a notary. When entering a port where there is no notary office, the master of the ship is obliged to obtain documentary evidence certifying that he has applied for a sea protest and to make a corresponding entry in the logbook. Thus, the Sea Protest to be filed at the next port of call upon presentation of such documentary evidence will have the relevant evidentiary value. In case of a foreign port the Sea Protest according to Article 395 of the MSC is to be lodged to an official of consular institution of the Russian Federation or to a competent official of foreign state in the manner prescribed by the legislation of the appropriate state.

According to Article 400 of the MSC a notary or an official of the consular institution of the Russian Federation, on the basis of a statement of Sea Protest made by the master of the ship, data of the ship's logbook, interview of the master of the ship and, if necessary, of other members of the crew, draws up an act of Sea protest and certifies it with his signature and stamp. It is the act of Sea Protest

that establishes the legal assumption (presumption) of the release of the shipowner for losses caused by a marine occurrence. This assumption serves as a means to transfer the obligation to prove from one party to another.

Conclusion

A Sea Protest plays an important role in protecting the rights and legitimate interests of the shipowner, since it transfers the burden of proving the circumstances of a marine occurrence to the other party, putting the shipowner in an advantageous procedural position. However, the mere fact of making a Sea Protest is not enough to release the Shipowner from liability. A Statement of Sea Protest does not relieve the shipowner from possible liability for the consequences, but the fact of its commission creates a more advantageous procedural position for the persons for whom it is made in order to protect their rights.

The judicial and arbitration bodies recognize the Sea Protest as one of the most significant written proofs, on the basis of which their decisions are made. That is why it is expedient to make it properly and timely and to avoid any errors by notaries and competent officials in its drawing up.

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DOI 10.34660/INF.2022.78.38.008

ON THE FORMATION OF THE MORAL CULTURE OF THE FUTURE TEACHER AS THE BASIS OF HIS PROFESSIONAL ACTIVITY IN THE MULTICULTURAL WORLD

Markova Nadezhda Grigoryevna
Doctor of Pedagogical Sciences, Associate Professor
Full member of the Academy of Pedagogical and Social Sciences
Naberezhnye Chelny State Pedagogical University

Abstract. *The article reveals the need for the formation of the moral culture of the future teacher, its role both in his formation and in future pedagogical activity. The moral position of students continues to be formed in the process of professional formation. The basis of the teacher's professional activity is based on the eternal ideals of humanistic morality. The teacher's morality is characterized as his moral quality, reflecting in activity, behavior, actions and deeds.*

Keywords: *moral culture, future teacher, special abilities, moral qualities, competence, moral norms, etc.*

... no occupation requires so much good
will and such unceasing soul restlessness
as the position of an educator and teacher.
N.I. Novikov

Changes in the social and economic and social and political systems entail updates in all areas of science, technology, culture. A value-professional concept is born and formed in the updated conditions, laying the updated content of pedagogical education (ideas, values, universal methods of cognition, thinking, innovative approaches, technologies, etc.), which will allow the future teacher to study, comprehend, understand and apply professional values in pedagogical activity in order to form the moral qualities of students in the educational process.

Studying and analyzing the pages of the history of pedagogy, we can state that since ancient times, children have been brought up only by experienced, wise and highly moral mentors. Of course, the fundamental beginning in the professional activity of a teacher is love for children. But success in his/her work is determined not only by this important quality. To ensure the success of the activity can be his/her special abilities, professional knowledge, competence. The readiness of the

future teacher for professional activity includes the totality of his/her competencies and all the values of the future profession.

In the work we reveal the function and role of the teacher's moral culture in the system of professional relations. A morally formed teacher is always guided by the norms of morality, which reflect his/her convictions, the moral norms of professional behavior. Of course, the foundations of moral culture in a person are laid in early childhood. And a student who has come to receive a diploma of the profession of a teacher already has a certain level of moral culture. While studying at a university, the future teacher continues to develop his/her personality, professional position, ability for self-development through the study of the disciplines of the pedagogical cycle, realizes the social significance of the teacher's activity and responsibility for the results obtained. So, there is an understanding of the choice of a professional path and his/her own interests. The content of all blocks of subjects studied by students provides their general professional training, focuses on the acquisition of professional knowledge, and lays the fundamental general professional foundation.

No matter how times change, but the requirements for the personality of the teacher, for his/her preparation remain important and significant for a multicultural society. Professional activity requires a future teacher of moral culture and readiness for constructive interaction with students. The teacher's morality includes his/her personal characteristics, which combine important personality traits. These are kindness, conscientiousness, diligence, decency, truthfulness, responsibility, honesty, etc. In his works, K. D. Ushinsky wrote that personality is formed by personality, character is formed by character. It is difficult to disagree with this in all respects... The personality of the teacher is very significant for the child and has a significant impact on the formative subject of activity, on his/her interests, views, beliefs, habits, etc. The study of the works of the great Czech teacher J. A. Comenius allows us to find an analogy between the profession of a teacher and other professions: between a teacher and a gardener, an architect, a sculptor, a commander. After all, the qualities and actions of the teacher, both positive and not always desirable, are projected onto all students. Therefore, the necessary qualities of the personality of the future teacher are his/her moral character, moral culture and purity. Every hour, the teacher teaches his/her students moral lessons, develops in them a desire to learn, leads children to success in a multicultural developing environment. "The requirements of morality apply to any moment of behavior and to any life situation; it requires that each act of an individual correspond to its requirements" [1, p. 21], "... morality is a set of behavioral standards, attitudes, beliefs, ideas about what is proper and permissible ..." [1, p. 133].

An important moral quality of the current and future teacher in professional activities is the manifestation of tolerance in relations with children, colleagues, parents and in any problematic and life situations. The formation of tolerance in

the teacher helps him/her constructively solve almost any issues. Such a teacher knows how to peacefully coexist with people around him/her of different levels of development, nationality, culture, etc. Sharing the opinion of A.A. Huseynov, I.S. Kon that “Tolerance is a moral quality that characterizes the attitude towards the interests, views, beliefs, habits and behavior of other people, expressed in the desire to achieve mutual understanding and agreement of diverse interests and points of view without the use of pressure, mainly by methods of explanation and persuasion” [2, p. 567]. Therefore, each teacher needs to form such an important moral quality as tolerance. The teacher carries out pedagogical activities in a multicultural children environment, where children have different interests, inclinations, nationalities, etc. In interaction with the children's team, he/she is obliged to show tact, respect, tolerance equally to all students. After all, the school is an important social institution where a developing personality is formed in a multicultural space.

Undoubtedly, in relationships at different levels, the teacher should show empathy. The concept of "empathy" from ancient Greek is understood as the ability of a person to feel another, to be in his/her state and feel similar feelings. This personality trait is also of great importance in the professional activities of a teacher. Developed empathy for the teacher allows using more than 40 different methods of influencing the child's personality in the educational process. With a high level of empathy, the teacher is more calm, balanced and is characterized by a low level of anxiety. K. Rogers describes empathy as a free and adequate expression of one's feelings and experiences in behavior. He tells how important it is to get closer to children's feelings, to understand them, to help in a timely manner and orient students to the manifestation of emotional responsiveness, to teach children not to be indifferent, to exclude rudeness, disobedience, but to be themselves, while maintaining dignity, honor, conscience, etc. for a teacher in relations with them.

The professional activity of a teacher can be full of anxieties and worries, joys and sorrows, innovative searches and the choice of the optimal solution in a problematic educational situation. The profession of a teacher, as it were, tests him/her for the manifestation of wisdom and patience, professional skill, and competence in all life situations. As accurately emphasized in his works by N.I. Pirogov that “In pedagogy, elevated to the level of art, as in any other art, it is impossible to measure the actions of all figures according to one standard, it is impossible to enslave them into one form. On the other hand, one cannot allow these actions to be completely arbitrary, wrong and diametrically opposed". It is important to introduce students to the values of the future profession, to form a system of value orientations in them, to improve in the system of professional relations.

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DOI 10.34660/INF.2022.26.75.009

MANIFESTATION OF SPECIAL ENDURANCE IN FEMALE RUNNERS IN THE PROCESS OF RUNNING 200M AND THE METHOD OF MANAGING ITS DEVELOPMENT

Galukhin Rudolf Mikhailovich
Candidate of Pedagogic Sciences, Associate Professor
Moscow City University

Abstract. *An analysis of the dynamics of the time of running a distance of 200m by female athletes of various levels of preparedness is presented. The main components for controlling the level of special endurance have been identified. Proposed methodological material for practical application in planning the training process.*

Keywords: *Running speed dynamics. Timing. Special Endurance. The use of training aids in the process of training female athletes in sprinting.*

The effectiveness of the training process management, the use of tools and methods aimed at solving training problems, to a certain extent depends on the knowledge of the patterns of speed change in the process of running at a distance of 200m. It should be noted that all issues related to the study of the dynamics of running speed have a theoretical and practical significance, because understanding the patterns of speed changes in the process of running among female athletes of various levels of preparedness will allow taking these phenomena into account in planning the length and intensity of the training segments, as well as controlling the level of preparedness of sprinters.

Naturally, by the end of the 100 m distance, and especially the 200 m distance, the speed begins to decrease, which indicates a decrease in efficiency, the inability of the central nervous system and the motor apparatus to withstand growing fatigue, all this leads to a drop in running speed. However, there is not enough data on the dynamics of the speed of running at a distance of 200 m in women in the scientific and methodological literature, especially on the changes that occur in the second half of the distance, on the distribution of forces in the run itself along the distance and the patterns of speed reduction.

To identify the dynamics of running speed at a distance of 200 m, timing was carried out in the conditions of competitions of 154 athletes of various ages and sports qualifications. In the course of running at a distance of 200 m, the running

time was recorded at segments of the distance - 50 m, 100 m, and then every 10 m, until the end of the distance. The data obtained were grouped according to the sports qualifications of female runners, from the 3rd youth category to masters of sports, according to the Unified All-Russian Classification (Table 1).

In this case, this allowed us to establish the relationship and interdependence of individual time parameters recorded in the course of running at a distance of 200 m, which allows, on the one hand, to identify factors that largely determine the manifestation of special endurance in running at the studied distance, on the other hand, to characterize the internal structure of the special running preparedness of female athletes.

The results of timekeeping for segments of a two-hundred-meter distance made it possible to identify characteristic features in the change in time and speed of running among athletes of various qualification groups. Table 1 shows that with the growth of sports qualification, the time spent on overcoming the first half of the 200 m distance decreases, the same happens with the time spent on overcoming the second half of the distance. The difference in results (D.R.) between the time shown in running in the first half of the distance and the time in the second half reflects the level of special endurance. We see a slight difference in the results of highly qualified athletes (-0.04 - 0.18 seconds) and an increase in the difference in results, from 0.26 seconds for athletes of the 2nd category and up to 0.93 seconds for the 3rd youth category.

Table 1.

Time spent on running the first and second half of the 200m distance by female athletes of different levels of fitness and changes in the indicator of special endurance (D.R.) with the growth of sports qualification

Sports qualification for 200m running	Sports result at 200 m	Time shown on 1st half and sport. qual.	Time shown on 2nd half	D.R. over a distance of 200m
M.S.	23.86	11.95 – CMS	11.91	-0.04
C.M.S.	24.59	12.22 – I cat.	12.37	0.15
I cat.	25.54	12.68 – II cat.	12.86	0.18
II cat.	27.24	13.49 – III cat.	13.75	0.26
III cat.	28.69	14.13 – I youth cat.	14.56	0.43
I youth cat.	30.23	14.87 – II youth cat.	15.36	0.49
II youth cat.	31.58	15.27 – III youth cat.	16.31	1.04
III youth cat.	32.97	16.02 – no cat.	16.95	0.93

A comparative analysis of the results of overcoming the first half of the distance in all category groups showed that the first half is overcome with results one category less than the main distance. In this case, the correlation analysis showed a significantly greater dependence of the final result in the 200m run on the time spent to overcome the second half of this distance (P<0.73) than on the time to overcome the first half (P<0.54).

An analysis of the dynamics of the speed of overcoming a distance of 200m in segments of 50 m (Table 2) made it possible to determine that the main changes in running speed occur in the second half of the distance. So, low running speed was recorded on the 4th segment. The degree of relationship between the result shown in the 200m run and the time to overcome each 50-meter segment of the distance is expressed in coefficients equal to: 0.47; 0.56; 0.69; 0.74. The growth of this relationship characterizes the high dependence of the sports result on the level of special endurance, i.e. the ability to maintain a high running speed until the end of the distance.

Table 2.

The speed of running 50-meter segments in the 200-meter run among female athletes of different levels of preparedness

Sports qualification	Speed on 50m segments			
	1 – 50m	2 – 50m	3 – 50m	4 – 50m
M.S.	7.74	9.01	8.66	8.18
CMS	7.67	8.60	8.47	7.72
I cat.	7.44	8.49	8.04	7.51
II cat.	6.89	7.98	7.56	7.05
III cat.	6.57	7.49	7.06	6.63
I youth cat.	6.35	7.04	6.74	6.35
II youth cat.	6.23	6.97	6.42	5.87
III youth cat.	6.11	6.37	6.06	5.74

Analyzing the changes in running speed in the second half of the distance of 200 m in segments of 20 m (from the beginning of the second half of the distance to the finish), we see that the speed of running in each 20-meter segment depends on the level of preparedness (Table 3). In all seven groups, from masters of sports to athletes of the 3rd youth category, there is a constant decrease in the speed of advancement in the segments under consideration. However, despite the ongoing decrease in speed during the run, we do not see that any of the athletes in one of the segments would show speed superior or lower in comparison with the qualifying groups sequentially located in the table. It can be noted that, regardless of the level

of preparedness, each group has its own layout in time and running speed on the analyzed segments of the 200 m distance.

Table 3.

Change in the speed of running 20-meter segments in the second half of the 200-meter distance for female athletes of different levels of fitness

Sports qualification	Second half of the 200m distance				
	120 m	140 m	160 m	180 m	200 m
M.S.	8.83	8.69	8.30	8.46	7.96
CMS	8.48	8.46	8.08	7.96	7.50
I cat.	8.10	8.00	7.90	7.63	7.27
II cat.	7.56	7.53	7.07	7.11	6.85
III cat.	6.97	6.85	6.90	6.76	6.43
I youth cat.	6.56	6.77	6.67	6.33	6.12
II youth cat.	6.38	6.46	6.22	6.10	5.65
III youth cat.	6.09	6.15	5.87	5.83	5.54

The decrease in speed on 20-meter segments of the second half of the run distance is characterized by an increase in the degree of interrelation. So, from the first to the fifth segment of 20 m, the relationship with the result for 200 m increases as follows: 0.57 - 0.61 - 0.76 - 0.70 - 0.78, and the overall result in the 200m run is mainly due to the time spent running the last 60 meters of the distance.

Therefore, one of the methods of control in the process of preparing runners for a 200-meter distance can be a comparison of the time indicators for overcoming the first half of the distance with the time of the second half, as well as control over the speed of running in the second half of the distance, on 50-meter and 20-meter segments.

The level of special endurance, as studies have shown, can be determined by the difference in results (D.R.). The smaller this difference, the higher the endurance (Table 1). As can be seen from the table, in the strongest runners this indicator is often negative.

The results of the timing made it possible to compile a table on the time of running the segments of the second half of the distance of 200 m (Table 4). Based on the data of this table, it is possible to control the level of preparedness of runners by the time of running segments of non-standard length. Suppose that an athlete is given the task to run 170 meters, and she ran them in 21.5 seconds, then this athlete has a willingness to run 200 meters in 25.5 seconds.

Table 4.

Dependence of the time of running segments of a distance of 200 meters on the level of preparedness of sprinters (during the run of 200 meters)

Sports qualification	Second half of the 200m distance										
	100	**110**	**120**	**130**	**140**	**150**	**160**	**170**	**180**	**190**	**200**
M.S.	11.95	13.11	14.25	15.43	16.55	17.75	18.96	20.14	21.31	22.58	23.86
CMS	12.22	13.41	14.54	15.75	17.01	18.12	19.41	20.65	21.93	23.22	24.59
I cat.	12.68	13.90	15.14	16.37	17.64	18.88	20.20	21.46	22.87	24.13	25.54
II cat.	13.49	14.78	16.11	17.44	18.77	20.14	21.51	22.89	24.32	25.75	27.24
III cat.	14.13	15.51	16.92	18.28	19.73	21.17	22.63	24.09	25.58	27.11	28.69
I youth cat.	14.87	16.31	17.92	19.34	20.80	22.28	23.79	25.39	26.95	28.57	30.23
II youth cat.	15.27	16.85	18.42	19.93	21.51	23.10	24.65	26.42	28.03	29.74	31.58
III youth cat.	16.02	17.68	19.30	20.90	22.49	24.26	25.96	27.67	29.36	31.46	32.97

The materials of this table make it possible to expand the range of use of training segments along their length, to establish and control the intensity of execution, and also to monitor the level of special endurance in athletes involved in sprinting.

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DOI 10.34660/INF.2022.64.22.010

RESEARCH OF INTEREST IN BOOKS IN CHILDREN AGED FIVE TO SEVEN YEARS OLD

Liayskina Anna Vladimirovna
Candidate of Philological Sciences, Associate Professor
Moscow Pedagogical State University
Ammacheva Ekaterina Nicolaevna
master's student
Moscow Pedagogical State University

Abstract. *The article presents a methodology for studying interest in a book in children of five to seven years old and presents the results of its testing.*

Keywords: *literary education of preschool children, interest, reader interest, research of children's reading interest*

Introduction

At the turn of the 20th and 21st centuries in Russia, the attention of researchers to the initial stages of literary education became much more active. The range of scientific knowledge associated with the development of psychological, psychophysiological, pedagogical aspects of children's reading has expanded. However, almost every modern study contains its own conceptual and categorical system, which gives rise to terminological ambiguity. Reading development, literary development, early stages of reader ontogenesis, reader competence, genre competence, reading activity of a preschool child; introducing children to reading, the methodology of children's reading, literary - the list of terms is extensive. Some proposed definitions reveal a narrow understanding of the problem, due to the one-sided approach of the researcher, while others, claiming a wide coverage of the phenomena under study, are superficial.

Currently, there is a persistent desire of scientists to understand the nature of the most complex psychological and pedagogical phenomenon, which is denoted by the phrases "interest in the book" or "reading interest". However, numerous scientific, educational and methodological publications, educational programs that broadcast different interpretations of the concept, not only do not bring proper clarity to the very essence of interest, but add even more uncertainty in the direction of further psychological and pedagogical research and methodological developments.

A generally accepted definition of the concept of “interest in a book in pre-

school children" does not exist today. The obscurity of the subject itself significantly complicates its study in ontogeny.

The relevance of the work is due to the existing contradictions:

- between the social need to raise a spiritually developed reading personality and the recognition of the importance of fiction in the development of a child, on the one hand, and the real state of reading interest in older preschool children, on the other hand;

- between the need to solve the problem of educating the reading interest, which is declared in the exemplary educational programs of pre-school education, and the variety of existing definitions of concepts;

- between the need to determine the characteristics of reading interest in children of older preschool age and the lack of diagnostic tools to identify the level of development of reading interest.

The resolution of these contradictions constituted the research problem: what are the effective methods for studying the reader's interest in children of older preschool age?

Purpose of the study is the development and testing of a methodology for studying reading interest in children of senior preschool age. To achieve the goal, it is necessary to solve the following tasks: to study the scientific foundations for the development of interest in a book in preschool children; develop and test a methodology for studying interest in a book in children of five to seven years old; analyze the results of testing the developed methodology.

We understand by the readıng interest the special attitude of the child to the book in the work: emotionally positive, cognitive, selective, conscious, valuable, active. It develops and is formed under the influence of works of art of the word in the process of various types of children's activities (listening, reading, artistic speech, play, productive, etc.).

Materials and methods

To conduct an empirical study, a methodology was developed for studying the readıng interest in children of older preschool age. The study was conducted by the method of online questionnaires using Google forms in the period October-December 2021. The study involved 93 children aged five to seven years old (of which 20 were five years old, 41 were six years old, and 32 were seven years old). In order to identify the attitude of parents to the problem of developing reading interest in children, a survey was conducted, in which 112 parents of children aged five to seven years old took part. A survey of teachers (50 participants) was also conducted in order to summarize the pedagogical experience in studying the readering interest in children. All survey materials were developed in accordance with modern scientific ideas about the essence of interest in literature, as well as taking into account the requirements of the Federal State Standard of Preschool Education.

Individual conversation "The experience of perception by children of five to

seven years old of artistic works of different genres"

The purpose of the conversation is to identify the preferred genre for listening (fairy tale, story or poem), the experience of perceiving works of different genres, children's knowledge of the distinctive features of various genres (fairy tale, story, poem, proverb, riddle) and the ability (skill) of children to compare literary works and small folklore forms in accordance with the genre affiliation, the breadth of the reading interest (the richness of literary experience).

The questions of the conversation are divided into thematic blocks:

1) Getting to know the child.

- What is your name?
- How old are you?
- What do you like to listen to the most? (fairy tales, stories, poems)
- What are your favorite books?

2) Folk tale.

- Do you like listening to folk tales? Why?
- What is a folk tale? (if the child finds it difficult to answer, ask the following question);
- Is a folk tale a fairy tale that was composed by the people or one author?

What folk tales do you know?

- What characters of folk tales do you know?

Do you remember what words a fairy tale usually begins with? What words do they usually end with?

3) Author's fairy tale.

- What is a fairy tale? (if the child finds it difficult to answer, ask the following question);
- Is an author's fairy tale a fairy tale created by the people or written by one author?
- "Little Red Riding Hood", "Puss in Boots", "Thumbelina", "The Tale of Tsar Saltan", "The Tale of the Dead Princess and the Seven Bogatyrs" - are these folk tales or author's?

4) Story.

- Do you like listening to stories? Why?
- What is a story? (if the child finds it difficult to answer, ask the following question);
- Is the story a story that can happen in life or is it a story about magical, fictional events?
- What stories were read to you, what do you remember?

5) Poem.

- Do you like to listen to poems?
- Is a poem a small work, where there is a rhyme or is it non-rhythmic speech?

Who is a poet? Does the poet write poetry or stories?

- Do you have a favorite poem? Remember the first lines (write down 2 lines if the child remembered)

6) Riddle.

- Guess the riddle: “A girl is sitting in a dungeon, and a scythe is on the street”;

- What is a riddle? (if the child finds it difficult to answer, ask the following question)

- I describe the object, name its signs, and you guess - is it a riddle or a story?

Now ask me a riddle.

7) Proverb.

- Listen to the text: “You can’t even pull a fish out of the pond without difficulty”: do you think this is a riddle or a proverb?

- What are the names of the wise words that people came up with many years ago - a proverb or a riddle?

- What proverb do you remember?

The blocks contain questions of open and closed type, basic and auxiliary.

Open-ended questions (for example, Do you like to listen to folk tales? Why?) are aimed at identifying the most important components of reader interest: awareness, depth. When processing the results, we took into account the extent to which the answer was motivated by the child.

Close-end questions with suggested answers (for example, “Remember what words a fairy tale usually begins with?”) enable the child to choose an answer from the proposed options (as a hint), thereby setting him up for a positive conversation. We assumed that questions aimed at defining the genre would be difficult for children (What is a folk tale? What is an author's tale?), so instead of one question, we offered two: one is the main one, the other is auxiliary (for example, a folk tale is a fairy tale written by the people or one author? Is an author's fairy tale a fairy tale created by the people or written by one author?). Auxiliary questions were not obligatory; they were supposed to be asked in case of difficulties for the child in answering the main question. Thus, we gave each child the opportunity to correctly answer the question, and thus kept the child's positive attitude for participation in further conversation. We thought that all children would be able to answer auxiliary questions, but, as the approbation showed, even in this case, some children did not cope with the task.

The procedure for conducting a conversation: In a calm, relaxed atmosphere, the experimenter asks questions to the child. The question can be read again (if required). The conversation contains basic questions (for example, “What is a folk tale?”), followed by an auxiliary question with alternative answers (for example: “A folk tale is a fairy tale written by a people or one author?”), If the child answers the main question, then you do not need to set an auxiliary one. The parent carefully, without interrupting the child, listens to the answers and writes them down in the proposed form to fill out.

Criteria for evaluating the responses of children are presented in the table.

Table 1.

Evaluation criteria

Level	Evaluation criteria
Optimal	The child names preferences among the proposed genres; names a few favorite books; explains why he/she liked/disliked certain genres, motivating the answer with knowledge of some genre features (fairy tale, short story, poem, riddle, proverb); names works in accordance with a given genre (folk and author's fairy tale, story, poem); names "software" works for his/her age group; lists the characters of folk tales; familiar with the concept of "poet"; responds to requests to guess a riddle, remember a proverb; gives the correct answer; correctly answers the main questions (does not need an alternative question), motivates answers to open questions.
Admissible	the child names preferences among the proposed genres; names 1-2 favorite books; seeks to explain why he/she liked/disliked certain genres (fairy tale, story), interests are weakly motivated (for example: “because it is interesting”, etc.); distinguishes genre features (fairy tale, story, poem, riddle, proverb) on an intuitive level (“stories are told, fairy tales are composed”, etc.); distinguishes genre features with the help of auxiliary questions; lists literary works that do not correspond to the "program"; distinguishes genre features of a fairy tale (beginning, ending); when asked to guess a riddle, he/she explains the subject in his/her own words or names an excerpt from a poem; When asked to remember a proverb, he/she gives the correct answer.
Critical	the child does not name preferences among the proposed genres; does not name his/her favorite book or remembers with difficulty (for example, “I don’t remember what it’s called”), instead of books he/she names cartoons; finds it difficult to explain why they like/dislike certain genres (fairy tale, short story); does not distinguish between the features of literary and small folklore genres (folk and author's fairy tale, story, poem, riddle, proverb); finds it difficult to name literary works in accordance with their genres, recalls fairy tales and poems for younger children (“Teremok”, “Turnip”, “Kolobok”) lists the characters of folk tales from the repertoire for primary preschool age; does not name the genre features of the fairy tale (beginning, ending); not familiar with the concept of "poet"; does not respond to a request to guess a riddle and remember a proverb; unable to correctly answer a multiple choice question.

Results and discussion

The study showed that a critical level in the development of reading experience is observed in approximately 22% of children. An acceptable level was noted in approximately 65% of the children who participated in the survey. The optimal level is found in 14% of preschoolers.

The results of the survey of parents showed that all survey participants understand the importance of introducing children to fiction, they want to see their children reading in the future. However, only half of the participants contribute to the formation of the child's ability to communicate with the book.

Questioning of teachers revealed that all participants agree with the statement of the need to study the reading interest in preschoolers. But only 50% of the respondents conduct pedagogical monitoring to identify the level of literary development of children. The author's methods indicated by the teachers for studying the reader's interest among preschoolers give us reason to assume that teachers find a narrow approach in understanding the essence of reading interest, they evaluate only the products of children's artistic and speech activity based on the texts of literary works (retellings, creative stories, children's compositions).

Conclusion

Thus, the developed methodology for studying the reading interest in children of senior preschool age made it possible, firstly, to identify the current state of interest in the book in modern children aged 5-7 years, and secondly, to determine possible directions and ways of further studying reader's interest.

In the process of analyzing the approbation of the developed diagnostic tools, we identified the positive aspects of the technique and its shortcomings. We were able to obtain primary data on the development of the most important characteristics of reading interest - an emotionally positive attitude, selectivity, depth, breadth, and awareness. However, in order to obtain better and more complete information, it is necessary to conduct further research in the following areas: identifying the level of development of interest in a book among children; the formation of the teacher's professional competence in the field of educating the reader's interest in children; study of the requests and educational needs of parents. In our opinion, to study such a multi-component education as interest, a set of methods is needed. Along with surveys, one should use the observation technique, game diagnostic situations for conducting in an offline format.

The developed methodology for studying interest in a book in children can be used by practitioners when conducting pedagogical diagnostics in order to study reading interest in older preschoolers (in online and offline formats).

DOI 10.34660/INF.2022.14.60.011

FORMATION OF PROFESSIONAL FOREIGN LANGUAGE COMPETENCE OF A FUTURE COMPUTER SCIENCE TEACHER BY MEANS OF INFORMATION TECHNOLOGY TRAINING

Koloskova Galina Alexandrovna
graduate student
Institute of Education Development Strategy
of the Russian Academy of Education
Lyamina Irina Mazhitovna
Senior Lecturer
Yashina Yulia Vladimirovna
Senior Lecturer
Kapustin Ivan Vladimirovich
Senior Lecturer
Russian University of Transport

Abstract. *The article is devoted to the formation of the competence of a computer science teacher in the field of using knowledge of a foreign language in professional activity. Also, the influence of digital technologies on the formation of this competence is considered. The authors carried out a theoretical analysis, made conclusions and proposed solutions.*

Keywords: *digital educational environment, teacher competencies, professional development, teacher training, foreign language competence.*

One of the promising trends in the reform of modern education is the promotion of a competence-based approach as a priority in the training of specialists in various fields. Over the past 5-10 years, federal targeted programs "Computerization of rural schools", "Electronic Russia", "Computer to every school" have been implemented in Russia, aimed at informatization of education, in particular at creating an information educational environment in which students and teachers could intensively use information and communication technologies in the educational process [1].

Informatization of education, including language education, is directly dependent on the competence of teachers to use modern information and communication technologies (ICT) in the educational process. In recent years, many pedagogical

studies have appeared in which scientists give priority to the use of ICT and multimedia technologies in education Robert I.V., Kozlov O.A., Kastornova V.A. [4;6].

However, the incompetence of teachers to use the full didactic potential of modern information and communication technologies hinders the process of informatization of education in general and the intensification of teaching of a particular discipline in particular. It should be noted that at the moment the pedagogical literature describes the didactic properties and methodological functions of many common Internet technologies (blog technologies, wiki technologies, podcasts, linguistic corpus, educational Internet resources, information and reference resources of the Internet). Depending on the specific academic discipline, taking into account its specifics, the set of ICTs and the degree of their use in the educational process will vary. At the same time, it is necessary to consider the methods of using specific ICTs exclusively within specific disciplines, since the same tool can be used to develop different skills and form different competencies, depending on the purpose of training, within a specific discipline [2].

A foreign language is one of the disciplines of the humanities cycle taught in 1-2 courses of all areas of training. One of the main goals of teaching a foreign language at the university is the formation of students' foreign language communicative competence in all the diversity of its components (language, speech, socio-cultural, compensatory, educational and cognitive), necessary for students to communicate in social and professional spheres. That is why the use of ICT in teaching a foreign language will be aimed at the development of speech skills (reading, speaking, writing, listening), language skills (lexical, phonetic, grammatical) and the formation of socio-cultural and intercultural competencies, and the ICT competence of a foreign language teacher will consist in the ability to use the entire arsenal of ICT in the process of teaching aspects of a foreign language and types of speech activity [3].

In this regard, the place and role of a foreign language in the system of professional training in the field of programming and computer science in general is changing significantly. Of paramount importance are not only practical foreign language skills, involving knowledge of the business language in oral and written speech, the ability to use the language in their professional activities, but also a combination of these skills with professional work on the computer. The analysis of both the labor market in the field of the use of applied information technologies and the results of training specialists in the field of applied informatics and computer engineering shows that many graduates of secondary specialized educational institutions can really read literature in their specialty with a dictionary or work with text using electronic translators, but find it difficult to express their thoughts in a foreign language both in everyday and in the business sphere. Most have never learned to work with foreign language literature "from scratch", to read computer information transmitted in a foreign language through communication channels,

comprehending what is stated there. Unfortunately, they are unable to participate in the communication process, they find it difficult to perceive foreign speech by ear and visually, they are not capable of rapid transformation of the translated message; its actualization and adaptation for feedback. All this is a consequence of insufficient elaboration of the problem of teaching a foreign language in professional educational institutions in close connection with the profession.

In modern conditions, the formation of knowledge is not the main goal of education. Knowledge and skills as a unit of educational result are necessary, but insufficient to be successful in the modern information society. For a person, it is extremely important not so much encyclopedic literacy as the ability to apply generalized knowledge and skills in specific situations to solve problems that arise in real life. Thus, knowledge is the basis of human competence, which is considered in the competence approach [4].

The competence-based approach focuses on the result of education, and the result is not the sum of the acquired information, but the ability of a person to act in various problematic situations, i.e. the results of education are recognized as significant outside the educational system. On the basis of a competence-based approach, the teaching staff, using the full range of pedagogical tools and techniques, should develop a model of professionally important qualities of a professional graduate of an educational institution in the specialty of a teacher of "Informatics".

The competence-based approach to building a model of training future teachers of "Informatics" reveals the importance of a foreign language not only as a means of communication in the professional field of a teacher as a programmer, but also its role in the construction of formal language constructions (based on the identity of morphological, syntactic, semantic constructions of the English language and programming languages), which is an integral attribute of the professional competence of future specialists. Foreign language competence is a set of knowledge, skills and abilities formed in the process of learning a foreign language, as well as the ability to perform certain activities based on the acquired knowledge, skills and abilities [5].

The foreign language competence of a teacher of "Informatics" is an integral component of his professional competence, as it allows a modern specialist in his professional activity to update himself intellectually as adequately as possible both at the receptive and productive level and thanks to which he will be able to get acquainted with the latest achievements in the professional field. All programming languages, which are the means of work of a specialist in the field of applied computer science and computer technology, are based on linguogrammatic constructions of the English language, the level of proficiency of which determines the speed of memorization and interpretation of programming language constructions. In addition, a specialist who speaks English improves the reaction of communication with the operating system during an interactive dialogue, solves the problem

of debugging and editing the program much faster, and many other professional aspects of a specialist in the field of applied computer science and computer technology. Various programs are usually created in English, as firms often conclude contracts with foreign investors. And to work with the program, you need to know a foreign (English) language. Learning English is already the first step for a more in-depth study of the programming language and for greater professionalism in the field of applied computer science and computer engineering. When translating, knowledge of English helps to avoid the slightest mistakes and inaccuracies, and this can interfere with further work or lead to a system failure. Also today, a lot of technical information literature is offered, in which it is not so easy to understand without knowledge of the language, or it is almost impossible at all [6].

The process of informatization, which has now covered all aspects of the life of modern society, has several priority areas, which, of course, should include the informatization of education. It is the primary basis of the global rationalization of human intellectual activity through the use of information technology. The wide spread of information and communication technologies in all spheres of human activity, the growing role of information are making significant changes in the life of modern society. Due to the rapid digital progress, continuous professional development of personnel is necessary. This is primarily necessary for educational organizations.

The modern school and the educational process are constantly undergoing various transformations, including those related to the introduction of new educational technologies. In this regard, the question of the need for continuous development of professional competencies of teachers and their professional qualities is acute. This is necessary so that they can quickly and effectively master new educational technologies introduced into the educational process, and then successfully use them in the course of their professional activities. In the context of updating the content of education, the need for a teacher who is able to modernize the content of his activities through critical, creative development and the application of scientific achievements and advanced pedagogical experience has increased. In this regard, the functions of methodological support that ensures the activity of the teacher are also changing [7].

With the development of the trend of continuing education, there is a need to improve training within the framework of additional professional education. Continuing education is characterized by flexibility in time, place, content, learning technologies and many other features that contribute to the best preparation of students in modern conditions. Modern advanced training courses should take into account these features. Therefore, today professional educational institutions are in search of the most suitable technologies, methods and tools that meet the specifics of adult education. Project activity is currently one of the most effective ways to train employees of educational organizations.

Thus, knowledge of a foreign language is an integral part of the professional training of future teachers of "Informatics" and a prerequisite for their successful professional activity. Foreign language competence can be considered as the ability of future specialists to solve various tasks in the field of professional activity, to work with scientific and technical literature and documentation in a foreign language, to search and analyze information necessary for studying foreign experience in the field of the chosen specialization, and thereby creating prerequisites for professional and personal growth, thereby increasing the effectiveness of professional activity.

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DOI 10.34660/INF.2022.72.71.012

LISTENING SKILLS IN THE PROCESS OF TEACHING RUSSIAN AS A FOREIGN LANGUAGE AT THE INITIAL STAGE OF TRAINING

Chireikin Mihail Kimovich
Candidate of Philological Sciences, Associate Professor, Head of Department
Novosibirsk Higher Military Command School of the Ministry of Defense of the RF
Chireikina Olga Yuryevna
Candidate of Philological Sciences, Associate Professor, Head of Department
Siberian University of Consumer Cooperation

Abstract. *The article discusses the role of listening in the process of teaching the Russian language to foreign students, notes the features of this type of speech activity, analyzes the difficulties in perceiving the sounding material that students have. The article also offers methodological recommendations on the formation of listening skills and abilities at the initial stage of teaching foreign students.*

Keywords: *listening, Russian as a foreign language, speech activity, foreign students, primary level of education, A1, TRFL-I*

Introduction

Listening is a complex type of speech activity, which consists of many components. In the methodology of teaching foreign languages, the term "listening" is understood as "the process of perception and understanding of sounding speech, where perception is characterized by the analysis and synthesis of language means (phonemes, morphemes, rhythmic groups, types of IC, logical stress centers, sentences, text, etc.)", and "understanding is the result of the analysis and synthesis of the semantic meanings of these linguistic means" [5: 228].

According to linguists, the speech activity of a modern person is organized as follows: we devote 45% of the time to listening, 30% to speaking, 16% of the time to reading, 9% to writing [3: 14]. That is, listening is an integral and significant link in speech communication, an independent type of speech activity, as well as an integral part of the speaking process in situations of dialogic and polylogical communication. Mastering listening skills, therefore, is an important stage in the process of learning any foreign language already at the initial stage of learning.

Despite the presence of nuances in the existing definitions of the term listening given by various linguistic schools and researchers, it is common for all to inter-

pret it as an active verbal-thinking process, including recognition, understanding and interpretation of sound information.

A foreign citizen who came to Russia to get an education, from the first minutes of his stay in the language environment, is faced with the need to participate in the listening process. Education at the university is the area where the role and share of listening are predominant. Students should listen to teachers' explanations and comments for several hours a day.

All these points necessitate training in listening skills already from the first classes of students at the initial stage of teaching any foreign language, including Russian as a foreign language (hereinafter - RFL).

Purpose of the study

In this paper, we will consider the main methodological aspects of the process of teaching foreign students to listen at the stage from the elementary level (A1) to the 1st certification level (TRFL-I).

Coming to study at Russian universities, foreign students, as a rule, do not speak Russian. Before becoming a 1st year student, they must study the Russian language in depth within the framework of the preparatory department. This training lasts an average of 10 months. During this period, a foreign student must master the requirements of elementary (REL), basic (RBL) and 1 certification level (TRFL-I) of Russian language proficiency. In other words, as applied to the European Testing System, students must start their studies at the preparatory department, their knowledge of the Russian language at the A1 level, and after 10 months reach the B1 level. The presence of a certificate of achievement of the TRFL-I level is mandatory for foreign applicants of Russian universities.

Thus, the purpose of this study is an attempt to analyze the process of formation of the auditory skills of foreign students, based on the continuity of the stages of learning from the A1 level to the TRFL-I level.

Materials and methods

In this article, we use the following research methods: general scientific (observations, comparative), communicative method and design method. The methodological basis of this article is the fundamental provisions of the general methodology for teaching Russian as a foreign language.

Results and discussion

When selecting material for listening, the RFL teacher must first of all focus on the requirements of the State Standard for Russian as a Foreign Language to the appropriate level of language proficiency. Russian language proficiency levels are determined in accordance with the Order of the Russian Ministry of Education and Science dated 04.01.2014 № 255 "On approval of the levels of proficiency in Russian as a foreign language and the requirements for them."

The state standard for RFL elementary level establishes the following requirements for the student's speech skills in terms of listening:

"Listening of monologue speech"

A foreigner should be able to: understand by ear the information contained in a monologue statement.

Subject of the text: relevant for everyday, socio-cultural and educational spheres of communication.

Type of text: specially composed or adapted plot texts (based on lexical and grammatical material corresponding to the elementary level).

Text volume: 120-150 words.

Number of unfamiliar words: up to 1%. Speech rate: 120-140 syllables per minute.

Number of presentations: 2.

Listening to dialogic speech

A foreigner should be able to: understand by ear the content of the dialogue, the communicative intentions of its participants.

Subject of the text: relevant for the everyday sphere of communication.

The volume of the mini-dialogue: from 4 to 6 replicas, the volume of the dialogue: up to 12 replicas.

Number of unfamiliar words: up to 1%.

Speech rate: 120-150 syllables per minute.

Number of presentations: 2" [1:8].

Which material can meet these requirements of the standard?

At the initial stage of training, the listening skill can begin to be formed on the material of individual words and phrases, as well as unrelated sounding sentences. However, with the development of auditory skills, i.e. when teaching listening as a type of speech activity, the text becomes the main unit of learning. Listening training should be based on a set of audio texts and accompanying tasks.

In the first 2-3 months of training, the sounding material, in our opinion, should almost entirely consist of lexical material familiar to students. These can be texts based on the topics studied (City, Shop, Transport, etc.).

You need to understand that listening is one of the most difficult aspects of learning a language. Difficulties encountered by students in the process of listening are multifaceted. These difficulties may be "related to:

- with the conditions for presenting information;
- with the language form of the message;
- with the meaning of the message;
- and also proceed directly from the source of the message" [4: 52].

To help students overcome these difficulties, it is necessary to understand the mechanism of their occurrence. It is also important to take into account the fact that at the initial stage of education, foreign students still have insufficiently formed socio-cultural competence and lack knowledge about listening strategies.

The first type of difficulties is due to the irreversibility of the sounding mes-

sage, as well as the pace of the speaker's speech.

In the pedagogical environment, there are disputes about the need and expediency of re-presenting the text for listening. Of course, the goal of teaching listening is to develop the skill of perceiving sound information in students in conditions of natural communication. With such a requirement, repeated sounding of the text is impossible. However, at the initial stage of learning, one cannot do without re-listening to the text. It is the repeated listening to the message that allows students of the prethreshold and threshold levels of language proficiency to assimilate the sounding information.

The rate of speech of the speaker voicing the text, of course, plays a big role in the process of perception of the material. In real situations of communication, the rate of speech of the same person will change depending on his mood. You can offer students to listen to texts recorded by the same speaker, but with different emotional coloring and speech speed, with different pauses. More important information can be spoken more slowly, minor information more quickly. But, ultimately, the sounding text should be as close as possible to the real life situation.

In everyday communication, as a rule, there is no clear sound of the text, devoid of any noise interference. For this reason, many modern educational complexes for Russian as a foreign language include audio texts accompanied by various extraneous sounds (wind noise, passing vehicles, sounding announcements in vehicles, muffled speech of other people, etc.). Such audio material trains listeners to highlight the necessary information in the process of sounding.

Difficulties associated with the linguistic form of the message are divided into phonetic and lexical. Among the phonetic difficulties that slow down perception are the reduction of sounds and the assimilation of consonants. Students of the initial level of education do not immediately get used to the fact that in Russian the spelling and sounding of words do not always coincide. Lexical difficulties are manifested in the frequent presence of colloquial forms in the sounding text, the presence of idioms, unnecessary vocabulary, which complicate the perception of the material. Therefore, especially at the initial stage of training, it is necessary to monitor the correct selection of the introduced lexical material in the tasks for listening.

The difficulties associated with the meaning of the message lie in the fact that often the text proposed for listening is not interesting to listeners in terms of content. In addition, it is very difficult to hear information overloaded with numbers, geographical names, proper names. The perception of such words requires additional time and effort, and, accordingly, the following material escapes the attention of the listener. These words, as a rule, do not carry meaningful information, so they are quickly forgotten.

The difficulties associated with the source of the message are due to the fact that the sounding voice is always individual. Each person has a unique timbre,

accent, features of articulation and even speech defects. Students get used to the voice of the teacher, with his help they begin to learn the perception of speech by ear. But today, in the methodology of teaching RFL, the rule has become a postulate that the speakers of texts teaching listening should be a variety of people - men, women, children, people of different ages. Foreign students should learn to perceive the age-related features of the articulation of native speakers.

Practice has proven that students perceive the sounding speech of a person who is next to them much easier than the speech of an announcer from a TV or computer screen. Therefore, it is more expedient to start learning to listen at the initial stage "live", gradually moving to traditional ways of presenting information - the use of audio or video materials. In the methodological literature, it has been repeatedly noted that it is video materials, due to “the situational nature and dynamism of the video story, that make it a particularly effective tool for teaching listening” [6: 52]. The video series develops the associative memory of students, contributes to a better assimilation of lexical and grammatical material.

By the end of the training, students of the preparatory department should reach the level of the requirements set by the State Standard for the first level of general knowledge of the RFL. They are the following:

Listening to monologue speech

A foreigner should be able to: understand by ear the information contained in a monologue statement: the topic, the main idea, the main and additional information of each semantic part of the message with sufficient completeness, depth and accuracy.

The subject of the text is relevant for the social and social and cultural spheres of communication.

Type of text: message, narrative, description, as well as texts of a mixed type with elements of reasoning. The texts are authentic (a minimum degree of adaptation is acceptable).

Text volume: 500—600 words. Number of unfamiliar words: up to 3%.

Speech rate: 210—230 syllables per minute.

Number of presentations: 1—2.

Listening to dialogic speech

A foreigner should be able to: understand by ear the main content of the dialogue, the communicative intentions of its participants.

The topic of the dialogue is relevant for everyday and socio-cultural spheres of communication.

The volume of the dialogue: at least 10—12 extended replicas.

Number of unfamiliar words: up to 2%.

Speech rate: 210—230 syllables per minute.

Number of presentations: 1—2” [2: 8–9].

As you can see, the requirements for the level of a graduate of the preparatory

department in terms of listening increase, relatively speaking, twice as compared to the initial one.

If at the elementary level of language proficiency, the student is essentially required to perceive, then at the TRFL-I level, it is expected to have the skill of critical understanding of the text, taking into account communicative goals and listening strategies.

Conclusion

Thus, listening should be a regular task in the RFL classes, starting from the initial stage of training, and also be a mandatory part of the exam. The principle of progressive learning to listen at all levels of language proficiency remains relevant in the RFL teaching methodology. The fact that foreign students are in the language environment and actually take part in listening every day in the classroom cannot be an excuse for the refusal of listening by some RFL teachers.

In order for the process of teaching listening to be successful, the RFL teacher must be very careful in the selection of material. This material should fit into an integral system of lexical and grammatical exercises and tasks at each specific stage of learning. The advantage should be given to authentic audio texts, no matter how difficult it may seem to work with them.

In the modern RFL teaching methodology, listening is not just an educational activity, one of the aspects of language learning, but also a way of forming sociocultural and linguistic and regional competences.

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DOI 10.34660/INF.2022.46.30.013

NOMINATION PECULIARITIES OF RUSSIAN AND ENGLISH PHRASEOLOGICAL EUPHEMISMS

Arsentyeva Yulia Svyatoslavovna
Candidate of Philological Sciences, Associate Professor
Kazan Federal Universty

Abstract. *The article is devoted to the study of Russian and English phraseological euphemisms, namely, to the investigation of the peculiarities of euphemistic nomination of extralinguistic objects of reality characterized by pejorative evaluation. The results vividly show that two types of evaluation are engaged in the process of euphemistic transference of meaning: logical and emotive. On the whole, the euphemistic function of softening or camouflaging of pejoratively evaluated real extralinguistic objects is due to the peculiarities of the image underlying phraseological and euphemistic transference of meaning of such linguistic units.*

Keywords: *phraseological euphemisms, transference of meaning, pejorative evaluation, prototype, image*

Introduction

If lexical euphemisms have been and are the object of study of a number of native and foreign researchers, phraseological euphemisms still remain on the periphery of linguistic research. They were studied either together with other euphemisms – lexical units, as well as set expressions of a non-phraseological nature, or analyzed from a conceptual point of view, or as components of phraseo-semantic groups.

Purpose of the study is to establish the most typical features of phraseological euphemisms as linguistic units the purpose of which is to nominate extralinguistic objects of reality which are characterized by pejorative evaluation. The role of the prototype of phraseological euphemisms as well as the image underlying phraseological and euphemistic transference of meaning is under study.

Materials and methods

Phraseological euphemisms are characterized by the following typical features: transference of meaning, separability, stability (lexical and grammatical) with the possibility of contextual transformations, imagery and high significance of connotation in the structure of their phraseological meaning. Russian and Eng-

lish phraseological euphemisms were selected from different unilingual and bilingual euphemistic and phraseological dictionaries with the help of the method of continuous sampling.

Besides, our research requires comparative analysis as well as semantic (seme) analysis, the method of definitional analysis and systematic-semantic approach to the study of Russian and English phraseological units. The investigation is accompanied by the methods of observation and description.

Results and discussion

A literature survey on the issue and our study show that phraseological nomination can be considered as a replacement of more rude, taboo words and expressions that are unacceptable from the point of view of native speakers, which in turn denote such extralinguistic realities, with transferred euphemistic units of a more veiled or softer nomination. Phraseological euphemisms are the result of such a nomination, they have gone through a process of double transference of meaning - phraseological and euphemistic. The ability of phraseological euphemisms to designate taboo, socially unacceptable real denotations is largely due to their innner form. The image underlying the phraseological and euphemistic transference of meaning plays a dominant role in this process. L.P. Krysin pointed out that "... objects that are not named or named with difficulty for ethical, cultural, psychological or any other reasons, need a euphemistic designation; the renewal of nominations is dictated by the need to veil or soften again and again the essence of real objects the naming of which is considered inconvenient, indecent, etc. in polite society" [1, p. 388].

The results of the analysis confirm the words of the scientist and indicate that the rethinking of pejoratively assessed extralinguistic denotations is based on melioratively or neutrally assessed images by the linguistic community. For example, intervention or invasion is euphemistically referred to in Russian as «интернациональная помощь», instead of a direct expression of indignation or indignation at something unpleasant or inappropriate, the euphemistic expression «милое дело» is used, old age is poetically called «осень жизни (лет)», and early death – «безвременная кончина». In English, life after death is expressed with the help of amelioratively evaluated images "better country (place)" or "better (next) world", a special form of torture is designated as "water cure", a place of communication with prostitutes is expressed with the help of the neutral nomination "night club".

While considering the features of the prototype of Russian and English phraseological euphemisms in details, we come to the conclusion that their main task is to soften, present a more acceptable and tactful unsightly essence of concepts that express undesirable, indecent, taboo or tactless extralinguistic denotations from the point of view of moral or social norms of the language community. "The motivating image is the main reason for softening and veiling the significational-

denotational meaning of phraseological euphemisms in both compared languages" [2, p. 51]. Therefore, it is quite natural that the images on which the euphemistic nomination is based cannot cause unpleasant associations, be rude or undesirable for the normal perception of native speakers. Such a statement is true both in relation to bookish or neutral phraseological euphemisms, and to rethought euphemistic units belonging to stylistic layers which are below the literary norm.

The opinions of scientists regarding the assignment of informal language units to euphemistic units are ambiguous. A.M.Katsev, pointing to the existing tendency to exclude all colloquial elements from the euphemistic dictionary due to the fact that rude words and expressions do not serve as a softening function, cites as a justification for the possibility of their inclusion in euphemistic units the words of E. Partridge, who is a well-known scientist in the field of English slang. E. Partridge, as one of the reasons for using slang, points to its ability to "soften the tragic, alleviate or embellish the inevitability of death or insanity, or disguise the disgusting and deeply hurting human meanness / betrayal, ingratitude / ..." [cit. by: 3, p. 55]. The study of Russian and English phraseological euphemisms proves that a number of informal units can indeed serve the purpose of softening, camouflaging some pejoratively assessed extralinguistic phenomena of the surrounding world.

Thus, neutral images lie at the heart of the majority of informal phraseological euphemisms, a number of which are characterized by playful or ironic emosemes. In Russian, such euphemisms are represented by colloquial and vernacular units. As examples, one can cite such Russian colloquial rethought expressions as the homonymous phraseological euphemisms «подкрепляться спиртным (водкой, шкаликом). подкрепиться спиртным (водкой, шкаликом)» with the meaning "become drunk", a colloquial expression with the emoseme of irony «поправь галстук (бабочку на рубашке)», meaning advice in the imperative mood "zip up your fly", or a colloquial unit «такие дела», which is used instead of the direct name of menstruation. The label «разг.-простор.» was introduced by E.P. Senichkina to indicate the boundary position of these units between colloquial and vernacular [4]. The appearance of such units indicates the mobility and blurring of stylistic boundaries, the possibility of a gradual transition of stable expressions from one stylistic layer to another.

Colloquial and jargon rethought expressions belong to informal phraseological euphemisms in the English language. For example, military jargon is represented by such phraseological euphemisms as "circular error probability" with the meaning "the extent to which ordnance will miss the target", "civilian impacting" meaning "the killing or wounding of civilians in error". Both phraseological units owe their appearance to the Gulf War [5].

The question regarding the evaluativeness of phraseological euphemisms also arises. A.M.Katsev believes that the evaluation of euphemisms is negative, regard-

less of whether they refer to ancient taboo units, or later formations that are not indirectly connected with the supernatural [3]. We believe that such a statement is not always justified, especially when it comes to euphemistic nominations of God or some animals hunted by primitive people. Critically evaluating the "pejorative concept" of A.M. Katsev and Z. Lukhtenberg, N.M. Berdova points out that ignoring changes in the assessment by scientists in the process of euphemistic nomination leads them to an erroneous statement. In her dissertation, the scientist claims that: "Indeed, the logical assessment of the signified in the areas of taboo is negative, but in certain situations it enters into a contrast relationship with our emotional evaluative position in relation to one or another denotation or its features based on our perceptions and ideas. In this case, the objective qualitative assessment of the denotations comes into conflict with the optional emotional-evaluative one, as a result of which a "conflict" arises between the signified and the signifier, which forms an additional evaluative meaning, which receives a positive manifestation in the euphemistic meaning" [6, p. 21].

It is clear that the author uses the term "logical" assessment to denote an assessment based on logical, rational judgments about unacceptable, condemned extralinguistic denotations, i.e. about the signified in opposition signified - signifier. At the same time, it is from the point of view of the signifier that euphemistic phraseological units are characterized by the so-called "emotional" assessment, since the euphemistic nomination brings the appearance of more favorable associations that veil unpleasant, rude, unacceptable ideas about pejoratively evaluated extralinguistic denotations.

Thus, a rational, logical assessment is focused on the object of assessment, which is of an extralinguistic nature, and an emotional assessment is determined by the subjective perception of this extralinguistic object and with a subjective scale of values. As for phraseological euphemisms, the logical assessment of the vast majority of them is pejorative due to the negative nature of the object of the euphemistic nomination, while their emotional assessment, based on subjective perception, in some cases can receive additional evaluative meaning and even shift along the scale of evaluativeness to the side of neutrality or meliorative evaluation.

Such a shift on the scale of evaluation, which contributes to the fulfillment of the euphemistic function of softening or camouflaging the repeatedly evaluated real denotations, is caused by the features of the signifier, i.e. figurative content of phraseological euphemisms. "The emotive component of meaning is associated with feelings that arise in a representative of a cultural community in connection with associations caused by an internal image that underlies the inner form of a phraseological unit. … It is the image of the inner form of phraseological units that determines this or that emotiveness, which, in turn, contains an assessment on the part of the speaker" [Kononova 2010:58]. Such a statement can be rightfully attributed to phraseological euphemisms.

Conclusion

Phraseological euphemisms are not just an interesting, but also difficult object for research, since their formation is based on complex mechanisms of double transference of meaning – both phraseological and euphemistic. Phraseological nomination, on the other hand, is a complex process of replacing rude, taboo words and expressions that are socially and morally unacceptable to native speakers with phraseological euphemisms of a more veiled, soft and camouflaging nomination. The main thing in this process is the ability of the language, with the help of acceptable linguistic means, to designate pejoratively assessed extralinguistic real denotations. The ability of phraseological euphemisms to designate taboo, socially unacceptable real denotations in a veiled way is largely due to their internal form, namely, the prototype of these units, the image underlying phraseological and euphemistic transference of meaning.

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DOI 10.34660/INF.2022.11.71.014

INITIAL ABBREVIATION: LEVELS OF ASSIMILATION

Plotnikova Dina Valentinovna
Master of Humanities, Lead Expert
Republican State Treasury Enterprise "National Testing Center"

Abstract. *This paper discusses the features of the assimilation of the initial abbreviation. The survey was conducted among high school students of general education words. Analysis of the results showed that abbreviations can be both learned, partially learned, and not learned.*

Keywords: *initial abbreviation, learning levels, questioning.*

Introduction

Abbreviation, being one of the most popular ways of word formation, allows you to create units that can be used not only in writing, but also in speech. So, Alekseev D. I. notes that "it is erroneously believed that cuts are generated primarily by saving time, paper, etc., hence the prohibitions and restrictions. The abbreviation achieved success and became stronger mainly because it made it possible to create a whole-formed word, where before there was only a description of the concept" [1; 8].

The process of assimilation of abbreviations is similar to the process of assimilation of foreign words.

In the article by G.V. Pavlenko "The process of mastering foreign words and its characteristics", the author highlights the parameters that describe the process of introducing words [2], including long-term, gradual, uneven, communicative relevance.

Features of borrowing English abbreviations are studied in the work of B.D. Khodzhageldyev and O.S. Shurupova. [3]. Features of the development of abbreviations are considered in the work of Tibilova M.I. [4], where the researcher examines the features of the functioning of English abbreviations in Russian.

Purpose of the study – determine the features of the assimilation of initial abbreviations.

Materials and methods

The object of research is the initial abbreviation.

The list of abbreviations was compiled using the method of observation and random sampling, on the material of Kazakhstani and Russian newspapers "Ka-

zakhstanskaya Pravda", "Vremya", "Izvestia", "Vechernyaya Moskva".

In the questionnaire, opposite each stimulus word, four response options were given: KU (know and use); KD (know, but do not use); DD (do not know and do not use); DU (don't know, but I use it). The task of deciphering the abbreviation was not set before the respondents.

The experiment was conducted on the territory of Kazakhstan in 2018 in two stages.

Sample size for the first stage: 50 people, students of secondary schools. Age of respondents: 17–18 years old. Of these, 21 people are Kazakhs, 15 are Russians, 14 are representatives of other nationalities (Uzbeks, Germans, Ukrainians, Tatars).

Analyzed material: ***UN*** *- United Nations,* ***USA*** *- United States of America,* ***SMS*** *- Short Messaging Service,* ***ООН*** *- Организация объединенных наций, United Nations,* ***СМИ*** *- Средство массовой информации, Mass media,* ***ИИН*** *- Индивидуальный идентификационный номер, Individual identification number,* ***ЮКО*** *– Южно-Казахстанская область, South Kazakhstan Province,* ***МГУ*** *– Московский государственный университет, Moscow State University,* ***ЕГЭ*** *– Единый государственный экзамен, Unified State Exam,* ***РУДН*** *– Российский университет дружбы народов, RUDN University,* ***НТВ*** *– Независимое телевидение, Independent television.*

Results and discussion

The results of the survey are presented in Table 1:

- the first column contains a list of analyzed abbreviations;

- the second is the approximate life of the abbreviations. The term of functioning of the abbreviation is determined by the term of functioning of the reality itself. For example, the formation of the UN - 1945, therefore, the period of use of the abbreviation is ~ 77 years, the abbreviation СМИ entered the Russian language along with the term "Mass media" ~ 70s, therefore, its "age" at the moment is 52 years. Abbreviations that can be considered as ambiguous within the framework of the work are not used, since it is not possible to determine the period of operation of such an abbreviation;

- third, fourth, fifth, sixth - quantitative results of the survey.

Table 1.

Survey results

Abbreviation	Functioning period (years)	KU	KD	DD	DU
UN	~ 77	3	7	31	9
USA	~ 246	32	11	3	4
SMS	~ 30	45	5	-	-
ООН	~ 77	39	7	1	3

СМИ	~52	21	21	8	-
ИИН	~ 9	29	17	2	2
ЮКО	~29	32	15	3	-
МГУ	~267	23	17	7	3
ЕГЭ	~13	42	6	2	-
РУДН	~ 61	32	8	6	4
НТВ	~29	21	18	8	3
ОБСЕ	~28	22	23	3	2

Assimilated abbreviations are considered units that are marked in the KU column by at least 70% of respondents, as partially assimilated units that were noted by 50% of respondents. Thus, the abbreviations SMS (45), ООН (39), ЕГЭ (42), are accepted for learned, and USA (32), ИИН (29), ЮКО (32), РУДН (32) are accepted for partially learned.

It was assumed that the longer the abbreviation functions in the language, the better the participants in the experiment will know it. However, our assumption was not confirmed. Thus, the abbreviation ЕГЭ, which has been used in the language for 13 years, and the abbreviation ООН, which has been functioning for 77 years, according to the results of the experiment, are learned.

In order to verify the data obtained, a repeated experiment was conducted, where the subjects were tasked with deciphering the abbreviations, which we regard as learned in the first stage.

The sample size for the second stage of the survey is 100 people. Of these, 42 respondents are Kazakhs, 37 are Russians, and 21 are representatives of other nationalities.

At the second stage, the subjects were offered a questionnaire with supposedly learned abbreviations with the condition that if the subjects know and use the abbreviation in speech, then it must be deciphered or the meaning of the abbreviation indicated. So, the abbreviation USA is decoded 39 times, SMS – 45, ООН – 39, ИИН – 29, ЮКО – 32, ЕГЭ – 42, РУДН – 32.

It was assumed that the abbreviations that we consider as learned will be deciphered correctly, and when deciphering a partially learned abbreviation, various ways of semantization can be observed.

So, when deciphering the abbreviation SMS, none of the subjects indicated the correct and complete meaning - *Short Messaging Service*, however, the majority singled out the basic component "*message*" (37), which carries the main semantic load. From the point of view of a quantitative analysis of the results of the survey, we can consider the abbreviation as learned, and from the point of view of the analysis of the components of the abbreviation as partially learned.

Despite the fact that the subjects cannot correctly decipher the components of the SMS abbreviation, they actively use it in speech. So, in the thesis of Sukhanova I.Yu. "Derivational nests with a top-foreign word" notes that this abbreviation has all the signs of grammatical development [5]. Safonova N.N. notes the same phenomenon: "Some abbreviations of the Russian language are now perceived as words, and not as abbreviations (загс, смс (SMS), пиар (PR), вип (VIP), бомж, жэк, спа, ЕГЭ), actively forming a set of derivatives" [6, p.109].

As an example of a partially learned, consider the abbreviation ИИН (*Индивидуальный идентификационный номер, Individual Identification Number)*. Answers provided by survey participants: *индивидуальный идентификационных номер, individual identification number* (5), *индивидуальный номер, individual number (9), номер, number (7), идентификационный номер, identification number (3), инфекционный номер, infection number (1), индивидуальный инфекционный номер, individual infection number (1), индивидуальный налог, individual tax (1), именной номер, nominal number (1), мой номер, my number (1)*. So, only 5 people indicated the full decoding of the abbreviation, in other cases one or more components were deciphered (*номер, индивидуальный номер, number, individual number*), there is an attempt to decipher the abbreviation completely (*индивидуальный инфекционный номер, individual infection number*), as well as an attempt to describe the meaning based on personal association (*мой номер, my number*).

So, when deciphering the partially learned ИИН abbreviation, the subjects try to decipher the components of the abbreviation, and in the case of the learned SMS abbreviation, the subjects indicate the decoding of only one component instead of the value, without trying to write to decipher all the components.

Conclusion

Thus, an abbreviation can be considered *learned* when its full lexical equivalent can be reproduced and when it is associated only with its basic component. But in both the first and second cases, it is actively used in speech, and can even be perceived by speakers as an integrally formed word.

An abbreviation can be considered *partially learned* when one or two components of the abbreviation can be deciphered or a meaning can be described close to the meaning of the original phrase, including the scope of functioning or personal associations.

An abbreviation can be considered *not learned* if its meaning or the meaning of one of its components cannot be deciphered.

A detailed study of the levels of assimilation of abbreviations is possible using the methods of psycholinguistic research, including an associative experiment and a directed associative experiment.

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DOI 10.34660/INF.2022.92.45.015

ANTHROPOLOGY OF TECHNOLOGY - A THEORETICAL BASIS FOR EVALUATING TECHNOGENIC HUMAN TRANSFORMATIONS

Popkova Natalia Vladimirovna
Doctor of Philosophical Sciences, Full Professor
Bryansk State Technical University

Abstract. *Both the changes existing in the technogenic society in the consciousness and the biological human body, and the planned "improvements" of human nature with the help of the latest technologies are considered. It is shown that in the modern era, philosophical thought does not yet have a methodology for the worldview assessment of these projects, but the development of the anthropology of technology and the application of its principles to the analysis of man-made transformations of a person will allow them to give reasonable estimates and predict the future of mankind.*

Keywords: *technology, man, technogenic society, philosophy of technology, anthropology of technology, transhumanism, identification crisis.*

Introduction

In modern society, recognized by most researchers as technogenic (that is, its main characteristics are determined by the level of technology development and change in the course of technological progress), negative anthropological trends are accumulating. Despite the favorable consequences of technological progress for people (as evidenced by the growth of the Earth's population and the increase in average life expectancy), phenomena that threaten human well-being are already noted not only by philosophy, but also by social consciousness. The most well-known are negative changes in a person's personal self-awareness (united by the concept of "identification crisis") and the destruction of people's biological health [2], to neutralize which technological intervention in the body (and even the gene pool) of a person is proposed (which is called for by the so-called transhumanism).

The advent of NBICS-technologies actually led to the blurring of the boundaries between the world of man and the world of technology. If earlier "humanity challenged the surrounding nature", then the latest technologies "penetrate into the inner nature, transforming the very essence of man" [9, p. 149]. They talk about the possibility of "a global anthropological transition by overcoming the cognitive

and informational boundaries of human nature and building new neurocomputer interfaces in the mode of improving human functionality" [8, p.144]. Escape from material reality into virtual worlds, dissolution in cyberclones and avatars, the introduction of nanorobots into the human body - many promises of technological improvement of a person are voiced by supporters of transhumanism, predicting the creation of a "posthuman" [9, p.149]. We read about the onset of the "epoch of a new body", about overcoming "biospheric and sociospheric limitations" [4, p.50], about the fact that the "posthuman", which has arisen as a result of anthropotechnological transformations, will acquire "qualitatively new properties of corporality and in this way a new type of needs, new creative abilities of the mind ... new goals and methods of activity" [5, p.13].

Transhumanists believe that human evolution can be accelerated by turning an individual into a process of controlled self-improvement (self-upgrade), up to the implantation of machine elements into the brain for the sake of the illusion of being in virtual spaces and the creation of "ordered children" with an optimal set of qualities. This new perfect species has already received the name "posthuman". There are already calls for the transformation of human consciousness into an incorporeal "software" that can be reloaded into a computer network and get rid of the body. But the consciousness, which they seek to make immortal, is not in the best condition: more and more people in a technogenic society experience psychological problems even during a normal life span and strive to "escape from reality" in some way. A modern sociocultural phenomenon is noted - the "crisis of identification", which consists in the destruction of a person's holistic perception of himself as a person and a bearer of moral choice, and his life as a whole. The reason for this crisis is considered to be the transition to the information society: the streams of communication into which a modern person is drawn are numerous, heterogeneous, incommensurable, so the individual consciousness has lost the opportunity to integrate them into a single inner world. The disappearance of the "I" is understood as a result of the fact that in a technogenic society all traditions and hierarchies of values have lost their authority, and the concept of personality (an individual responsible for their actions) based on them has lost its meaning: it is argued that a modern person automatically reacts in accordance with those communication systems into which they are currently involved. If in a traditional society the normative practices directed by the individual to himself disciplined him and individualized him, then modern practices lead to the impossibility of perceiving one's life as a single explicable whole. A person is not able to realize his position in relation to incompatible values: the identity of consciousness is lost.

We have to remember that "all significant technologies in the history of civilization manifest themselves ambivalently and carry both social benefits and risks of social, environmental and personal destruction" [1, p.47]. Creation of mechanisms for "social assessment and examination of new projects (especially those

aimed at a radical transformation of human nature)", disclosure of "social acceptability ... of innovations and taking into account their hidden risk potential" [8, p.139] are becoming urgent tasks of the modern era. But this is hindered by the peculiarities of the mentality of the technogenic society: for example, the habit of taking into account "exclusively instrumental goals and objectives determined by the logic of scientific rationality" [3, p.138]. We will have to "pass between the Scylla of reckless progress and the Charybdis of alarmist, anti-scientist prohibitions" [1, p.50]. Therefore, the analysis of technogenic transformations of a person should be accompanied by a philosophy that allows an objective assessment of both spontaneously formed changes in people's lives that are of technogenic origin, and interventions in our body and mind planned with the help of the latest technologies. To identify and describe the so-called "anthropological traps" of the latest technologies [4, p.52] is one of the main problems of philosophy.

Purpose of the study – philosophical assessment of technogenic transformations of a person

Should we strive for a further technological transformation of man, or would it be more reasonable to be skeptical of the broadcast promises of transhumanism? The philosophy of technology arose in order to provide answers to such problematic questions of the interaction between man and technology: first of all, it seeks to find out why technology created to improve people's lives begins to complicate our lives, requiring its creator to adapt to itself in the field of cultural norms and social relations.

Left behind is the instrumental view of technology as an obedient continuation of the human body; philosophy today is looking for reasons for the relative autonomy of the technical world, expanding this concept and understanding the technical transformation of nature as a manifestation of the essential quality of man - his creative activity. To understand the reason for the discrepancy between the intention of technical creativity and its result, one has to recognize as the subject of technical activity not an individual person (who is able to control his technical actions), but transpersonal systems devoid of a control center.

What can the philosophy of technology answer the question about the nature and justification of technogenic transformations of man? At present, there are two main directions. According to one of them, industrial technologies are a special case of social technologies: technology is understood as a set of labor tools (created to meet socially recognized needs and used in accordance with social norms), implemented in given sociocultural conditions, sociocultural codes of work with natural reality (through its processing by technical practices). into an artificial one) and subjectively invested by a person in this process of meanings [7]. Seeing in technology a variety of social structures (not dependent on the consciousness of a person, but forming his consciousness in the course of socialization), this approach reduces the development of technical reality not to the personal will of

people, but to the self-development of the social field. A person is not able to control technology because it is the creation of a society, and not a separate individual; the cause of technogenic problems is the alienated state of social reality. According to another direction, technical change in nature is just a variety of the biogenic current of atoms that has increased the speed and scale, and technical progress is technoevolution controlled by the laws of nature [6]. Technique is understood here as the next step in the self-organization of the Universe (surpassing biological life in terms of the speed and scale of information processing): its autonomy is a sign that technical reality is evolutionarily more progressive than biological.

The lack of reflection on the discourses used in the discussion of technogenic problems leads to conflicting conclusions regarding the current state of mankind and its prospects. Should one remain human in the traditional, biological sense of this concept, or strive for reckless "improvement" of one's organism and consciousness? Not an autonomous technical or social reality is the subject of this decision, but an individual person. But the modern philosophy of technology, carried away by the global scale of the technosphere, pays little attention to the individual as a subject of technical activity. Therefore, it is necessary to use a new discourse that considers a person as the author of technical solutions, despite all the difficulties with identification. The most promising is the synthesis of the personalistic version of philosophical anthropology with the results of the philosophy of technology. This direction can be called the anthropology of technology.

Materials and methods

The term "anthropology of technology" has already been proposed: it was introduced by A. Huning, H. Sachsse and B. Pfaffenberger in the 80s of the XX century to designate an interdisciplinary field of knowledge at the intersection of philosophy, anthropology and the history of technology. This direction was developed for the analysis of socio-technical systems that are formed with the introduction of new technologies and change social relations. However, the concepts of the anthropology of technology have so far been related to the field of social aspects of technical activity and have not been extended to the analysis of the technical reshaping of man, although in this area they could be of revolutionary importance. What theses of the anthropological analysis of technology were put forward and substantiated by philosophers?

1. Technology is a philosophical category that reflects the degree of human freedom from external restrictions, realized through artificial processes that increase the efficiency of natural processes. This includes both industrial technology and information technology. Technique is everywhere where we transform the elements (natural and social, emotional and physiological), where we improve reality, overcoming limitations and realizing our goals.

2. Nature and human society (generating technology) are the steps of a single ladder of evolution: the common function of all technical objects is mediation

between the natural environment and people. Technical progress is the adaptation of mankind to the objective laws of the external environment (natural and social); Civilizational crises are considered as manifestations of the conflict between regularity and spontaneity of the results of human activity, which is caused by its ontological duality.

3. The construction of a technogenic society is not a fatal mistake of civilization, but a natural step in the development of mankind; the creation of the technosphere is the next stage in the transformation of the planet by living beings. Man continues the transforming mission of living matter by technical activity; one can strive not to reduce the artificial world, but to harmonize the development of mankind and the biosphere, to environmental protection.

4. Technology helps a person to overcome the limitations imposed by nature or society, but the person himself, his biological organism and his consciousness, is their creation. Therefore, opposing external coercion, he fights with himself. Here is the main contradiction of technology: a person, being a socio-natural being, transforms the irrational aspects of his essence, not always understanding the consequences of technological changes.

5. Technique, created as a result of technical mediation of an ever larger area of people's lives, as it becomes more complex, gets out of the control of mankind. What we call the autonomy of technology is in fact partly a consequence of the conflict between the global scale of technical reality and the lack of a single center that manages it (this source of autonomy may eventually be eliminated, but whether this will serve the good of mankind is unknown), partly a manifestation of a common phenomenon for all forms of human activity, called alienation by G. Hegel and K. Marx (and this aspect of autonomy, most likely, will not disappear and will spread even to environmental activities).

So, the anthropology of technology is freed from the extremes of technophobia, which curses technology for the "enslavement" of man, but shows the need to draw boundaries between justified interference in natural processes and transformation that threatens to destroy the human essence. Let's apply the principles of the anthropology of technology to identify the essence and humanitarian justification of technogenic transformations of man.

Results and discussion

The first conclusion of the anthropology of technology concerns the possibilities of technologization of the organism and human consciousness. In principle, two levels of a human being lend themselves to mathematical and technological modeling: bodily and mental. Everything that concerns the soul and spirit, feelings and aspirations, is unformalizable. Therefore, if a creature created by technological means turns out to be viable, then it will be deprived of the sensual and irrational, instincts and ideals. It cannot be called human. Thus, the project of transhumanists is not about the "transition of man into a machine", but about a

new thinking being. However, what will it think about, having neither personal interests nor emotions?

The second conclusion concerns the ontological duality of technical reality: it is designed and implemented by individual people according to their goals, but both the goals and the means of their implementation are determined by the sociocultural environment, which sometimes distorts the results of activities beyond recognition (for example, no one has consciously created technologies for air pollution or the World Ocean, but the fact that the market economy has long ignored environmental costs has led to the neglect of negative environmental consequences when creating new technologies). Thus, conscious aspirations to technologically improve human life (even the most humane ones, aimed at creating new medical technologies), can, refracted in the social environment, have an unforeseen effect (for example, new technologies will be used to create weapons of mass destruction or to manipulate people's minds). This dangerous trend has been recorded too often in the course of history, so that today it is fair-hearted to consider the humane goals of the development of new technologies as a guarantee of the humane results of their implementation.

The third conclusion is a consequence of the latest biological and ecological concepts. Supporters of transhumanism adhere to such scientific paradigms that have already been rejected at the modern, post-non-classical stage of the development of science - for example, they represent living beings in the form of mechanisms. Where does the naive pre-psychoanalytic confidence come from that the personality is consciousness, and the content of consciousness is only information processing? And other living beings (not to mention ecosystems and the biosphere as a whole) are much more complex than machines that process matter and energy. It is worth recalling at least the hypothesis of J. Lovelock that the Earth is a living being. We arrogantly try to improve what we have not yet fully known (and without even proving that such complete knowledge is possible).

The fourth conclusion concerns the impossibility of presenting the results of the technological transformation of man. Optimists see people as rational beings striving for long life, health and other objective benefits; it is concluded that it is enough to reasonably point people to the technological ways to achieve these benefits, how humanity will rush along the path of transhumanism into a bright posthuman future. But a person is an irrational being (as F.M. Dostoevsky showed), dreaming of "living according to his own stupid will": at least the situation with vaccination shows how the arguments of reason can control his behavior. Even if the promised technologies are developed and implemented, people's reaction to them cannot be predicted, and what kind of social conflicts may arise between their supporters and opponents is hard to even imagine.

The fifth conclusion concerns the autonomy of new technologies: all the experience of technical (not counting political, economic, etc.) human activity testifies

that any innovations (no matter how good goals they may be called and no matter how much benefit they bring) always had, in addition to the expected and positive consequences, unexpected and negative consequences (for the elimination of which new technologies had to be introduced, and so on). It can be considered proven that the discussed technologies for improving a person will have such negative consequences. Therefore, before embarking on the implementation of new projects, it is necessary to identify possible undesirable results and outline ways to neutralize them. Too often, optimistic promises have turned out to be false and have led people who believed these promises to social and environmental disasters.

Conclusion

Having carried out an assessment of the sociocultural and anthropological consequences of man-made transformations of a person, which transhumanism calls for, with the help of anthropology of technology, it will be necessary to state the presence of at least three degrees of uncertainty:

a) the uncertainty of the results of new technologies (there will be negative consequences of their implementation, but it is not yet possible to foresee them, as well as to assess their scale);

b) the uncertainty of the application of new technologies (we cannot guarantee that new possibilities for changing people will not be used to the detriment of humanity);

c) the uncertainty of the reaction to these technologies (sociocultural conflicts between "traditional" people and "post-humans" can be very serious).

For the most part, modern humanity does not use even traditional, long-known technologies intelligently enough: the political and economic events of recent years have shown this quite convincingly. Giving people the latest technologies that allow the alteration of the very human body or consciousness is the same as handing weapons to a child. Having not learned to harmonize personal interests and the requirements of society, ignoring the simplest requirements of medicine and ecology, not being able to live in peace either with each other or with nature, most modern people simply have not grown up to the measure of responsibility that is required to make decisions about reshaping their body. The biotechnological revolution may seem arithmetically sound, but in the end lead to a loss for all participants. Here you need not seven, but seventy-seven times to measure and only then cut off. How many people do not want to admit this shows that the human mind has not yet developed enough to leave its shell: it still has a long way to improve, for example, to develop responsibility for its ambitious projects.

Since the prediction of the negative consequences of transhumanism projects using the available scientific methods cannot give a verifiable result, and the existing social mechanisms are aimed at gaining control over nature and people, it

is likely that the negative consequences of biotechnological transformations will prevail over the positive ones for a modern technogenic society. Further development of the anthropology of technology (as a philosophical direction that studies the relationship between man and technology, showing their mutual conditionality and creating new forms of their representation) is a necessary step for the development of philosophical knowledge and the creation of a theoretical basis for building the future. Thus, it is necessary to form a new philosophical picture of the world, in which the traditional concepts of nature, technology, and humanity will be rethought. On this basis, new types of social action will be proposed. Until then, radical projects for the transformation of human nature will be too risky.

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DOI 10.34660/INF.2022.46.58.016

THE MAIN DIRECTIONS OF RELATIONS BETWEEN UZBEKISTAN AND THE UNITED NATIONS

Nizomiddinkhujayev Otabek Ruslanovich
Basic doctoral student
Tashkent State University of Oriental Studies, Uzbekistan

Abstract. *The article analyzes the role and tasks of the United Nations in supporting the development of civil society institutions in Uzbekistan, the large-scale socio-political, socio-economic, judicial, legal, democratic reforms and transformations carried out in the country.*

Keywords: *Civil society of Uzbekistan, the United Nations, civil society institutions of Uzbekistan, development of civil society.*

United Nations Development Programme (UNDP) opened its office in Uzbekistan in January 1993 and has been actively supporting the country's development ever since. UNDP conducts a wide range of activities aimed at assisting the Government of Uzbekistan, civil society institutions, and ordinary people in overcoming numerous difficulties of the country's transition period. UNDP helps governmental and non-governmental institutions gain access to knowledge, experience and resources that are necessary for the successful implementation of economic and social reforms as well as the well-being of Uzbek people [2].

In Uzbekistan, UNDP's assistance under the current Country Programme Action Plan (2016-2020) focuses on two interrelated objectives. These objectives are to support the Government in implementing economic and democratic reforms, and to expand as well as foster the participation of civil society institutions in the development process at the national and local levels. UNDP's work in Uzbekistan focuses on two subject areas, namely good governance and sustainable development [12]

UNDP maintains mutually beneficial relations with many government ministries of Uzbekistan in the areas of environment and energy, public administration and economic management. UNDP is active in supporting the Government in creating an enabling environment for small businesses, in particular, UNDP assists in establishing Business Support Centers and One Stop Shops to provide public services to the population.

In the public administration sector, UNDP contributes to improving the ef-

ficiency, transparency and accessibility of public services at the national, regional and local levels. UNDP plays an important role in creating an e-government system in Uzbekistan, particularly through the development of a national electronic document management system, thereby enhancing the quality of public services. The agency also advocates for the adoption of the WHO protocol on the introduction of antiretroviral therapy (ART) by the Government of Uzbekistan, ensuring access to treatment for an additional 3,000 people with HIV [9].

Moreover, UNDP implements projects aimed at solving environmental problems and advocates for the rational use of energy resources in the country. UNDP plays an important role in drafting the Law of the Republic of Uzbekistan "On Water and Water Use", which embodies an important transition of the country from a fragmented to an integrated approach to water resources management. Over the last decade, UNDP has been actively supporting the creation of Uzbekistan's first biosphere reserve. UNDP has also assessed and mapped the unique flora and fauna of the republic on the Ustyurt plateau.

In today's complex circumstances, while the pandemic increases in its scope, threatening peace and stability, the role and responsibility of the UN increases as it is a universal international organization designed to bring member states together to promote peace and security, stability, protection of human rights, and sustainable development [1].

In Uzbekistan, human rights protection is seen as one of the priorities of interaction with the UN. At present, our country has established a stable political system that meets modern criteria of democracy and human rights, the legislative, executive and judicial authorities of all levels are actively working. But most importantly, respect for the principles of the rule of law and human rights is being established in society.

One of the most important priorities of state policy is increasing the culture of tolerance and humanism, strengthening inter-ethnic and civil understanding as well as harmony. Today, representatives of more than 130 nations and nationalities live in Uzbekistan as one family. In the country, religious organizations of 16 denominations operate freely. State educational institutions teach in seven languages, the National TV and Radio Company broadcasts its programmes in 12 languages, whereas newspapers and magazines are published in more than ten languages.

Uzbekistan highly appreciates the efforts of the Office of the United Nations High Commissioner for Human Rights (OHCHR) to strengthen the protection of human rights around the world, as without ensuring human rights it is impossible to solve the problems of socio-economic and spiritual as well as humanitarian development of the state.

Any society can achieve social progress and prosperity only when it is based on peace, the observance and protection of human rights, democracy, and the rule of law.

Civil society institutions are playing an ever-increasing role in ensuring human rights. It is impossible to imagine a modern, open, strong civil society without a developed system of stable and effective political parties that represent the interests of various social groups and broad segments of the population, non-state non-profit organizations, independent mass media, and other civil society institutions [7].

Currently in Uzbekistan there are more than 9,000 non-governmental organizations, 2,239 religious organizations, and 1,400 media outlets. These figures clearly demonstrate the role played by civil institutions in the life of our society.

The key motives leading to all ongoing reforms in the country are clearly education and enlightenment. Uzbekistan has been actively participating in the UN World Programme for Human Rights Education. All government agencies, civil society institutions, media outlets and educational institutions are involved in the process of disseminating universal ideals and values as well as the principles of respect and observance of human rights among the population.

It is not a coincidence that 7 percent of the country's state budget goes to education. In 2016, the Parliament passed a new Law "On State Youth Policy" to deepen our involvement in this area [5].

The texts on human rights of the main international documents of the UN, ILO, and UNESCO have been translated into the state language and are widely used in school, specialized secondary, vocational, and higher educational systems. Human rights classes are held during the preparation and advanced training of judges, prosecutors, lawyers, jurists, law enforcement officers, military personnel, and representatives of the business community.

Uzbekistan joined the United Nations (UN) as a new, sovereign, independent state in 1992. A year later, a UN office opened in Tashkent. Currently, the UN country team in Uzbekistan consists of 24 UN agencies, funds, and programs that work together to advance national development priorities in accordance with the 2030 Agenda and the Sustainable Development Goals [5].

Cooperation between UN agencies and the Republic of Uzbekistan is carried out within the UN Development Assistance Framework (UNDAF) 2016-2020, aligned with the national Action Strategy 2017-2021. Priority areas of cooperation are:

- Inclusive economic development with a focus on employment and social protection;
- High-quality health care and education for the full realization of human potential;
- Environmental protection to ensure sustainable development;
- Good governance to improve the quality of public services and the protection of rights.

In September 2020, the UN Insurance Team finalized the UN Cooperation

Framework for Sustainable Development (2021-2025). The Cooperation Framework articulates the UN's collective response to support Uzbekistan in achieving the national SDGs with a focus on ensuring that no one is left behind. The Cooperation Framework is the main tool for planning and implementing all UN development activities in support of the 2030 Agenda for Sustainable Development in Uzbekistan. It was prepared in close consultation with the Government, Parliament, and civil society of Uzbekistan [10].

The Sustainable Development Goals are a global call to action to eradicate poverty, protect the earth's environment and climate, as well as to ensure that people all over the world can enjoy peace and prosperity. Goals that the UN is working toward in Uzbekistan are: [4]

- Poverty Eradication: The widespread eradication of poverty in all its forms;
- Good Health and Well-Being: Ensuring healthy lives and promoting well-being for people of all ages;
- Gender Equality: Ensuring gender equality and the empowering all women and girls;
- Quality Education: Ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for everyone;
- Reducing inequalities: Reducing inequalities within and among countries;
- Decent Work and Growth: Promoting progressive, inclusive and sustainable economic growth, full and productive employment and decent work for everyone;
- Partnership for Sustainable Development: Strengthening the means of implementation and revitalizing the Global Partnership for Sustainable Development;
- Peace, justice and effective institutions: Promoting peaceful and inclusive societies for sustainable development, ensuring access to justice for everyone and building effective, accountable and participatory institutions at all levels.

Therefore, one can confidently say that over the past 29 years the relations between Uzbekistan and the UN have been full of significant events and are dynamically developing in all directions. The world community fully supported all proposals put forward by Uzbekistan within the framework of the United Nations, and today they make a tangible, practical contribution to global peace, stability and sustainable development. Our country remains committed to continue expanding and deepening mutually beneficial cooperation with the UN [3].

The period under consideration was characterized by the organization of meetings, round tables, surveys, expert and public discussions with broad participation of representatives of civil society institutions, media outlets, academia, and foreign specialists.

Some of the most significant international scientific-theoretical and scientific-practical events of 2017-2019 include events on the topics as follows: "Combating terrorism: cooperation without borders", "The role of women in the democratic

renewal and modernization of the country: the experience of Uzbekistan and international practice", "Improvement of electoral legislation and democratic elections: the experience of Uzbekistan and international practice", "Ensuring decent employment in the context of the Sustainable Development Goals: international practice and experience of Uzbekistan", "The role of citizens' self-government in strengthening families and raising the younger generation", "Action strategy and strong social policy: international practice and experience of Uzbekistan", "The role of youth in preventing and countering violent extremism and radicalization leading to terrorism", "Preservation of tangible and intangible heritage: current problems and strategies for their solution", and numerous of other topics [8].

These events were held with the participation of experts from the UN, the OSCE, and other authoritative international organizations, scientists as well as specialists from the United States, the EU, the CIS, and developed democratic countries [10].

It is important to take into account the proposals expressed by the foreign participants of the aforementioned events and also in the publications of authoritative foreign academic publications on the following topics: empowerment of women in the agricultural sector; "master-student" relations in production processes; mental tools of stability; empowerment of youth to study abroad; Islamic education; growth of youth self-identification as a result of the spread of advanced ICTs; attitude towards the facts of world history; nutrition in families with high religiosity, etc.

According to experts it is necessary to expand the range of discussed topics, the number of participants and their geography, to use interactive methods in the organization, to create a bank of expressed suggestions and comments, and to cover these events more widely in the media [11].

As it is known, informing society about the activities of state and economic management bodies, ensuring their accountability to the population is a necessary condition for implementing the norm of the Constitution of the Republic of Uzbekistan stating that "The people are the only source of state power". The concept put forward by the President Sh. M. Mirziyoyev conveys that "Not the people must serve state bodies, but state bodies must serve the people" [6].

An objective and critical analysis of the civil society condition reveals that the course of democratic reforms was generally based on the implementation of the most important constitutional norms that are social justice, continuous dialogue with the people, the openness of public administration, and the development of the mass media as the "fourth estate".

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DOI 10.34660/INF.2022.15.61.017

THE FRANKL RELEASE EFFECT − A MECHANISM FOR INCREASING THE SERIOUSNESS OF TRANSPORT ACCIDENTS BETWEEN COVID-19 PANDEMIC WAVES

Talalaeva Galina Vladlenovna
Doctor of Medical Sciences, Full Professor
Ural Federal University named after the first President of Russia B.N. Yeltsin,
Ural Institute of State Fire Service of EMERCOM of Russia
Permyakov Kirill Andreevich
Cadet
Ural Institute of State Fire Service of EMERCOM of Russia

Abstract. *The correlations between the statistical data of road traffic accidents and the dynamics of the number of people infected with COVID-19 in 2021 were studied. It was found that the number of trips of employees of the MES of Russia to incidents and the number of participants in accidents did not depend on the waves of the pandemic. The number of injured people and their share among road accident participants were characterized by a statistically significant inversely proportional dependence on the number of infected people. A delayed effect was recorded: the maximum number of injured was observed in the third month after the peak of the pandemic wave. The result obtained is interpreted from the standpoint of behavioral analysis as the effect of V. Frankl's release. It is proposed to take into account these facts in the preparation of employees of the Ministry of Emergency Situations of Russia.*

Keywords: *traffic accidents, pandemic waves, COVID-19, correlation analysis, behavioral analysis, delayed behavior, release effect.*

Problem statement

The current COVID-19 pandemic has marked a new stage in the organization of integrated security for the population and territories. This novelty, in addition to epidemiological protection measures, is associated with a qualitative change in the role of the human factor in the emergency situations (ES) of various nature. Experts in the field of social psychology associate the growing role of the human factor as a trigger mechanism for the development of emergencies and the prolongation of pandemic waves with such widespread psychological phenomena of the pandemic as anxiety, aggressiveness, depression, stress, and burnout syndrome

[1–4]. In a pandemic, an increase in abnormal forms of behavior is recorded not only among adults, but also among children, adolescents and students [5, 6]; as well as among doctors and rescue workers, designed to minimize the negative consequences of the pandemic [7]. Thus, in the last year there has been an increase in the number of accidents among employees of the Ministry of Emergency Situations of Russia during sports events and training camps. The reason for such dynamics of statistical indicators, according to experts, is the loss of safe behavior skills and personal negligence.

The change in the mental state of the population as a whole and the spread of negative psychological phenomena among socially active groups manifested itself in an increase in cases of aggressive driving. The problem of aggressive driving during the pandemic became so urgent that it became the subject of a legislative initiative and was considered in the State Duma of the Russian Federation, which introduced criminal penalties for reckless drivers [8, 9].

Employees of the Ministry of Emergency Situations of Russia carry out their activities in the regulatory field and at the same time are guided by the motto "Prevention, Rescue, Assistance", striving to be proactive in order to minimize damage from possible emergency situations (ES). The same strategy applies to road traffic accidents (RTA), for the elimination of which the duty units of the State Fire Service of the MES of Russia are involved. The implementation of the warning principle in this case requires knowledge of the characteristics of the risky behavior of people on the roads during a pandemic.

Relevance of the topic

The problem of minimizing the consequences of abnormal behavior of people in the era of a pandemic is of global importance. Studies of this kind in 2020-2021 are performed in many countries, including Italy, Spain, Germany, USA, Turkey, Great Britain, China, France, Brazil, Saudi Arabia, the Netherlands, and other countries. An in-depth study of 2,189 articles by researchers from foreign countries, performed by the staff of the Moscow State University of Psychology and Education, showed that “the short-term mental health consequences of COVID-19 are equally high for various countries where studies were conducted ... up to 61% of those infected face serious mental problems during disease, and 14.8 to 76.9% experience these problems afterwards” [10].

The practical significance of minimizing the prevalence of depressive-aggressive motives of people's social behavior during a pandemic is obvious, and therefore, in the publications of a number of specialists, the question of finding technologies that stop this phenomenon is raised. So, in [10] it is shown that today two technologies of coping behavior are mainly used: a rational explanation of the need for self-isolation and an emotional technology of cyberbullying, aimed at creating fear of infection and, as a result, reducing people's social contacts. In the same work, the lack of effectiveness of rational technology was noted and the

aggravating effect of the emotional technology of intimidation on depression was recorded. These indicators were positively correlated with each other.

The ineffectiveness of rationally-oriented and emotionally-oriented coping strategies for correcting abnormal forms of social activity of people in a pandemic was proved by the work of American researchers who revealed a direct relationship between the severity of depression and "the degree of disruption of the usual way of life, the inability to "enter "the fact of the pandemic into one's sphere" and thus proved the importance of using behavioral analysis to develop technologies for correcting abnormal behavior of the population during the COVID-19 pandemic [11]. The experience of using behavioral analysis to ensure security goals is well known and fairly widespread [12, 13]. Behavioral analysis has been successfully integrated into the comprehensive monitoring of the territorial mobility of contacts for COVID-19 in China, when conducting this monitoring, technologies of large databases, artificial intelligence, interactive and dialogue models of communication with target population groups are used [14].

However, existing databases, algorithms for their functioning and replenishment are aimed at identifying criminals and offenders. According to open sources of information, in these databases there are no special blocks devoted to describing the patterns of development of abnormal behavior among law-abiding citizens in the context of the long-term deprivation of social contacts in a pandemic. From a practical and theoretical point of view, it is for this reason that it seemed important to us to study the existence of possible relationships between indicators of traffic accident statistics and the wave-like dynamics of the number of infections with the COVID-19 virus.

Purpose and objectives of the study

The purpose is to study the variability of road accident indicators depending on the stages of the wave course of the COVID-19 pandemic in order to optimize the service training of employees of the Ministry Emergency Situations of Russia and increase the effectiveness of their subsequent work with the population to prevent and minimize damage from transport emergencies.

Research objectives: 1) to analyze the reports of the on-duty unit of the State Fire Service of the Ministry of Emergency Situations of Russia in Yekaterinburg to identify stable and variable indicators in them; 2) to systematize the data of the reports and bring them into a tabular form for subsequent in-depth analysis; 3) to substantiate the possibility of using the epoch superimposition method for a comparative chronological analysis of the monthly dynamics of road accident indicators and medical statistics; 4) to conduct a correlation analysis between road accident rates and the number of COVID-19 infections for the period of 2021 from January to December; 5) to develop practical recommendations for optimizing the service training of employees of the State Fire Service of the Ministry of Emergency Situations of Russia, taking into account the patterns of dangerous behavior

of the population identified during the study.

Sources of empirical data

Information on the wave dynamics of infections during the COVID-19 pandemic, as well as quantitative information on the number of infected people in Russia in 2021 by months from January to December, was taken from open Internet sources [15, 16]. According to these sites, the number of COVID-19 infections in Russia in 2021 amounted to 7,340,685 cases. Infection data presented on sites with a cumulative total was transformed by us into monthly infection statistics and summarized in an Excel table format.

Information about the accident was received by a fourth-year cadet of the Faculty of Fire and Technosphere Safety, junior lieutenant of the internal service Permyakov K.A. during his industrial (technological) practice on the basis of the 8th fire and rescue unit of the 60th fire and rescue squad of the Federal Fire-Fighting Service of the State Fire-Fighting Service of the Main Directorate of the EMERCOM of Russia in the Sverdlovsk Region. The information from the on-duty reports for 2021 was integrated into the tabular form of the Excel program with a step of one month.

Primary statistical processing of empirical material

The empirical database on road accidents included information on the date of departure, the number of departures (n=61), the number of participants in road accidents (n=390), the number of injured and dead (n=56). The primary statistical analysis of the empirical data was to summarize the report data by months. In addition to the indicators shown in the reports, we calculated the indicator of the severity of the accident. The indicator of severity of road accidents was calculated as the ratio of the number of injured and dead to the number of accident participants. This indicator was a relative value and was expressed as a percentage of the number of road accident participants for the analyzed period of time. The data obtained were structured in the format of monthly reports and summarized in a table format (Table 1).

Table 1.

Monthly characteristics of accidents included in the analytical development

Months of 2021	Number of trips to an accident	Number of participants in the accident	Number of dead and injured	Accident severity rate (%)
January	3	6	3	50,0
February	5	12	7	53,3
March	2	6	3	50,0
April	9	70	9	12,9
May	8	41	9	22,0

June	7	16	5	31,3
July	3	94	5	5,3
August	5	18	4	22,5
September	2	9	1	11,1
October	7	37	3	8,1
November	3	7	2	28,6
December	7	74	5	6,8

Analytical processing of secondary data

The secondary analysis of empirical data was carried out by the method of paired correlation analysis, based on the methodological techniques of chronological studies conducted in the format of superimposing epochs. Pair correlations were calculated between the number of infections in a certain month of the year and the numerical values of road accidents in the same month. The results of the correlation analysis are presented in Table 2.

Table 2.

Relationship between COVID-19 infections and accidents rates

Accident rate	The value of the correlation coefficient
Number of trips to an accident	-0,25
Number of participants in the accident	0,05
The number of dead and injured	-0,61
Accident severity rate (%)	-0,35

A qualitative analysis of the nature of correlations showed that the relationship between road traffic accidents and cases of COVID-19 infection is described mainly by negative relationships. This fact indicates that the maximum severity of road accidents occurs during the inter-wave period of the pandemic, when the number of infected people decreases and the transport activity of the population increases.

Quantitative analysis of the calculated correlation coefficients made it possible to clarify the conclusion made and to rank the indicators of road accidents according to the strength of their links with the dynamics of pandemic waves. In accordance with the data in Table 2, the analyzed indicators of road accidents form the following decreasing series: 1) the number of dead and injured, 2) the severity of road accidents as a percentage of injured and dead from the number of participants in road accidents, 3) the number of trips of employees of the EMERCOM of Russia to eliminate road accidents, 4) the number of participants in the accident. It is

obvious that the last two indicators in this series refer to weak links, which allows us to clarify the above conclusion and as follows: the organizational characteristics of road accidents (the number of accidents and the number of participants in accidents) are invariant indicators that do not depend on pandemic waves. A significant relationship between pandemic waves and road accident rates is recorded by those characteristics that reflect the qualitative aspect of accidents, their medical component, namely, the number of injured and dead.

To clarify the role of the behavioral component in the formation of links between pandemic waves and the dynamics of road accidents, empirical data were checked for the presence of hidden structures in them, namely, the phenomenon of delayed behavior and its version of the V. Frankl release effect [17]. It is known that the transformation of people's behavior patterns in many cases is characterized by a certain inertia and is not implemented immediately in response to an external stimulus, but with some delay in time. In the book "Man's Search for Meaning", its author V. Frankl notes that people who regained their freedom lost their sense of danger, committed risky and insufficiently considered actions. "The liberation itself, the sudden removal of mental oppression is psychologically dangerous," notes V. Frankl and compares the effect of liberation with decompression sickness, the consequences of which can be detrimental to the human body. He added on his own behalf that during the interwave period of the pandemic, euphoria from the illusion of freedom, temporary removal and / or reduction of social restrictions is superimposed on the phenomenon of detraining and reduced driving skills caused by prolonged self-isolation.

However, until now, the release effect described by V. Frankl has not been confirmed by quantitative indicators and has not been used to explain the mechanisms of variability in the severity of road accidents during the wave course of a viral pandemic.

Using the method of epoch overlap and chronologically shifting the curve of infection dynamics relative to the curve of the severity index of road accidents, we obtained the following results. The phase shift of the road traffic severity indicator relative to the COVID-19 infection curve by one, two, three and four months changed the strength of the links between these indicators from the initial -0.35 to -0.59; -0.71; -0.87 and -0.64 respectively. In other words, an increase in the time lag between the waves of COVID-19 infections and the severity of road accidents by one, two, and three months leads to an increase in the negative relationship between these indicators, followed by a decrease in the strength of the relationship with a further increase in the time lag between events.

Conclusion

Based on the results obtained, the following conclusion was made. The increase in the severity of road accidents in the interwave period of the pandemic is

a manifestation of the release effect; and is implemented with a time lag of three months relative to the peak values of the number of infected in the previous wave of COVID-19.

Practical recommendations

It is proposed to inform employees of the Ministry of Emergency Situations of Russia about the existence of delayed forms of risky behavior of citizens between the waves of the COVID-19 pandemic, to optimize the service training of employees of the State Fire-Fighting Service of the Ministry of Emergency Situations of Russia, including the basics of behavioral analysis; as well as to update the skills of providing first aid to the victims, timing these classes to the peculiarities of the interwave course of the pandemic.

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DOI 10.34660/INF.2022.71.99.018

ABNOTIVISM OF A TEACHER IN THE FORMATION OF CREATIVE THINKING OF STUDENTS

Akhmetova Galiya Mutievna
Master of Pedagogical Sciences, Lecturer
Caspian University of Technology and Engineering named after S. Yessenov
Dzhumabayeva Araylym
Student
Caspian University of Technology and Engineering named after S. Yessenov

Abstract. *The article considers the teacher's psychological readiness to work with schoolchildren as an integral characteristic, as a set of functional, operational and personal components.*

The author's definition of abnotivism is given as the teacher's ability to adequately perceive, understand and accept the student's creativity, the ability to notice a gifted student and provide him with the necessary support in developing his creative potential by constructing such an educational environment, the conditions of which become the means of self-development of the student.

Keywords: *giftedness, abnotivism, diagnostics and formation of abnotivism.*

Introduction

The role of a modern teacher differs from the role of a traditional teacher: to promote the development of the student's creative potential, and not as a repeater of educational information. Not just education, but the disclosure of their capabilities by the student. However, in real conditions in schools there is a tendency to suppress the creative activity of students by the teacher and there are often cases when students are unsure of themselves, ambiguous. "Everyone is keen to test everyone in everything" M. Makataev [1]. As N. S. Leites notes, children deliberately try to hide their achievements and talents and in most cases they can begin to blame themselves, because in most cases a high grade is put in the first place at school. [2]

Purpose of the study

Since direct opposition to resistance in pedagogical systems is ineffective, the teacher needs indirect methods that increase the potential of the student. A.G. Asmolov considers the traditional, unified school system as "dominant or in the zone of developmental delay" [3], i.e., not able to have a significant positive impact on

the realization of the student's potential. Thus, on the one hand, the child's giftedness is dictated by society, and on the other hand, giftedness falls into a crisis of impossibility of realization. All this is noted in the works of many scientists today. According to E. I. Shcheblanova, in elementary school, society loses about 30% of the most capable students with cognitive needs and abilities [4]. The attention of researchers is directed to students who have achieved high results in their studies or other activities. Outstanding achievements will undoubtedly become a symbol of talent and perseverance. Their manifestation in childhood or adolescence guarantees creative success in adult life and professional career.

Materials and methods

The theoretical basis of the approach aimed at the continuous creative development of the subject is acmeology, which is the science of the highest achievements in the professional and personal development of a person, the stages of a person's movement to his heights and the conditions for their achievement. Only a teacher who thinks and acts creatively can bring up the creative personality of a student. Therefore, modern acmeology and psychology emphasize the need to justify the fact that the teacher should play a leading role in maintaining and developing the child's creative potential [5; 6; 7; 8]. In this regard, it is advisable to raise the question of the existence of a particularly complex component of the teacher's creative professional thinking, which will help him to identify and develop the creative potential of students. This mental ability exists as a special intellectual quality of the teacher, manifested in the ability to find a vocation that will help the creative development of each student. Combining this quality, it can be determined that its presence is necessary for the formation of creative thinking of teachers, especially those who influence the educational policy of an educational institution. This quality is called abnotism, adequate perception through the intellectual abilities of the teacher, understanding and perception of the student in creativity, the ability to observe and demonstrate a gifted child, the necessary psychological and pedagogical support in the development of his creative potential.

Being an important component of psychological readiness to work with a child, abnotivism promotes professional and personal growth, as well as the development of students' creative thinking and creativity of students. A special role in the formation of abnotivism is played by the level of professional thinking of the teacher. The higher the professional level, the higher the thinking. Such a direct dependence is due to the need to update and implement the teacher's thoughts, since a close connection is formed in the process of interaction. In this regard, various communication strategies are considered, based on the following conditions:

1. gifted students with creative thinking ask their mentor questions that are especially in demand for an answer, resourcefulness;
2. sometimes students test the subject competence of the teacher;
3. most often, students ask questions, expecting support from the teacher. In

this case, there is a favorable opportunity to become like-minded people. The level of independence, its connection with professionally significant ones make it possible to assess the degree of psychological readiness of the teacher to work with gifted children capable of creative thinking.

Based on the ratio of criteria indicators in the structure of abnoctivity, the following levels of formation of this type of competencies are described: low, medium, high. They manifest themselves in different ways in the process of actualization of creative potential, which includes:

a) removal of emotional stress;

b) search and release of vital resources;

c) demonstration of feedback results. This potential is revealed at three levels:

1. cognitive – recall a similar situation that happened before, and note what was taught. Be able to see the main problem in the course of problems.

2. emotional – remember the very comfort of your life situation; feelings; calm thinking.

3.behaviorism – combining an imaginary image, a desired future, and an action aimed at achieving the desired, and then performing the "confidence, strength" actions. In general, the data obtained will be useful in the work of school psychologists to diagnose the ability of teachers to support and develop creativity in children. Another way to create a favorable atmosphere in communication with students is communication. Communication is a source of development of connections between people, due to the need for uniform activity [9].

Results and discussion

The purpose of the training program is to form the psychological readiness of teachers for work. Organizational conditions of the process of formation of psychological readiness:

cyclicity (training in several stages), the presence of psychological support in the intersessional period. Psychological and pedagogical conditions: subject-subject interaction, centralization, the use of interactive and innovative technologies, the design of the teacher's independent work, the organization of feedback.

1 stage (cognitive) – formation and development of the cognitive component of training students through meaningful reflection of the teacher of his pedagogical position through obtaining theoretical knowledge about the problems and essence, mechanisms for the development of giftedness in children. The criterion for the effectiveness of the stage is the transformation of scientific knowledge into the teacher's personal value.

2 stage (technological) – development of the technological component of teacher training through acquaintance with specific models, systems for organizing the identification and development of intellectually gifted students, approbation of developing technologies in practice. The effectiveness of the second stage is a meaningful expression of the technological skills of the teacher.

3 stage (development of the individual component of training) – seminar-training development of the individual intellect of the teacher. The stage efficiency criteria coincide with the efficiency criteria [10].

Independence is manifested in the process of creating the necessary internal conditions to increase the student's creative potential: the maximum stress of educational and cognitive activity, the provision of maximum freedom, friendly and constructive help, a friendly atmosphere, the transition from motivation to motivation, the adequate use of active and innovative methods of developing giftedness, the possibility of problematization of learned educational information.

Fundamentals of professional thinking:

a) knowledge of the psychological nature of thinking;

b) a positive, constructive approach to this knowledge;

c) the possibility of achieving a productive level in the implementation of their knowledge;

d) orientation in interpersonal relationships.

Conclusion

Professionalization of thinking – is a certain system of cognitive formation of the psyche, providing an understanding of the subject about the properties, functions of thinking, their properties and functions performed. The event component of the professionalization of thinking is characterized by developing situations, which, when realized, sometimes develop into significant events that have a decisive influence on the intellectual and professional development of the subject.

The competence of a teacher is determined by the structure of levels of independence, in our case, situational and supra-situational levels of identifying known and changing problems. It is in these developing situations (triggers) that the mechanisms that start the cognitive and personal business process of the student are launched, that is, the movement is activated. A special role in this case is played by the identification of signs of the situation that are important for the realization of creative potential. If they are not present, then their purposeful formation is carried out by placing reflective characteristics involved in the management of the creative cognitive process.

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DOI 10.34660/INF.2022.67.44.019

COGNITIVE FUNCTIONS IN COVID-19 PATIENTS

Kim Yuliya Vitalyevna
Student
Pavlov First Saint Petersburg State Medical University
Zueva Irina Borisovna
Doctor of Medicine, Head of the Department of Internal Diseases,
St. Petersburg Medico-Social Institute,
Head of the Center "Prevention and treatment of cognitive disorders",
Chief Physician FRESHCLINIC

Abstract.

Background. *There is growing evidence that coronaviruses can affect the central nervous system. However, little is currently known about the long-term effects of coronavirus infection on the brain and its consequences in terms of cognitive functioning.*

Aim of the study. *To study the cognitive functions and emotional status in COVID-19 patients.*

Materials and methods. *The study included n=48 people: the main group (n= 24, mean age 43.72±5.21 years) who had COVID-19 and the control group (healthy volunteers) (n=24, mean age 44.18± 5.32 years). All patients underwent neuropsychological testing.*

Results. *Most of the COVID-19 patients complained of persistent fatigue 24 (100%), poor sleeping 20 (83.3%), heart palpitations 20 (83.3%), memory loss 18 (75%). There was a decrease in the short-term memory score in patients included in the study (6.45±1.14 and 8.97±1.51 points, $p<0.05$), the MMSE test results (27.26±2.10 and 29, 81±2.93 points, $p<0.05$), "coding" test (40.37±9.64 and 48.91±9.86 seconds, $p<0.05$), and increased levels of anxiety (9.34 ±0.45 and 4.12±0.21 points, $p<0.05$) compared with the control group.*

Conclusions. *Deterioration in cognitive functions in general, a decrease in memory and attention, and an increase in anxiety levels have been registered in COVID-19 patients.*

Keywords: *cognitive impairment, memory, attention, COVID-19*

Introduction

Although SARS-CoV-2 mainly presents with respiratory tract infections and flu-

like symptoms, COVID-19 is now recognized as a multi-organ disease, often affecting the nervous system [1-3]. Neurological manifestations of varying severity have been reported in 36.4–82.3% of hospitalized COVID-19 patients worldwide [4,5].

Purpose of the study

To study the cognitive functions and emotional status of COVID-19 patients.

Materials and methods

The study included 48 people: the main group (n= 24, mean age 43.72±5.21 years) who have been diagnosed with COVID-19 and the control group (healthy volunteers) (n=24, mean age 44.18±5, 32 years old). The main group inclusion criteria: COVID-19 within one month before the beginning of the study, which did not require hospitalization. Exclusion criteria from the study: significant cardiovascular diseases, arrhythmias, heart and respiratory failure, use of antidepressants, severe emotional and behavioral disorders, use of psychoactive substances.

Cognitive functions were assessed in all patients included in the study with the use of neuropsychological scales: the Mini-Mental State Examination (MMSE), a number of tests for frontal dysfunction, a clock drawing test, the “10 Words - Luria” test, “encryption". The levels of anxiety and depression were determined using the hospital anxiety and depression scale -HADS. The survey results were processed using the computer program Statistica 6.0. To compare samples that meet the normal distribution criteria, Student's t-test for independent or dependent samples and analysis of variance (ANOVA) were used. The indicators are presented as arithmetic mean and standard deviation (M±SD). When systematizing and statistically processing the data, the differences were considered significant at a significance level of $p<0.05$.

Results

Most of the patients who had COVID-19 complained of persistent fatigue 24 (100%), poor sleeping 20 (83.3%), heart palpitations 20 (83.3%) and memory loss 18 (75%). Patients of the main and control groups did not significantly differ in gender, age, blood pressure, lipid and carbohydrate profiles. In both groups, such factors as smoking and level of education were comparable. In the main group of patients, there was a decrease in the short-term memory score (6.45±1.14 and 8.97±1.51 points, $p<0.05$), the MMSE test result (27.26±2.10 and 29.81± 2.93 points, $p<0.05$), "coding" test (40.37±9.64 and 48.91±9.86 seconds, $p<0.05$), increase in anxiety level (9.34±0 .45 and 4.12±0.21 points, $p<0.05$) compared with the control group.

Discussion

According to the results of previous studies among patients after COVID-19, the frequency of neurological symptoms (headache, dizziness, cognitive impairment) prevailed in elderly patients with concomitant cardiovascular diseases (arterial hypertension, coronary heart disease), in our study, cognitive deficiency was observed in middle-aged patients without a significant comorbid background

[6,7]. According to the results of our study, 75% of middle-aged patients without significant comorbidities who've had COVID-19 complained of deterioration in cognitive functions, in particular, memory loss. Compared with the control group, COVID-19 patients showed a decrease in cognitive functions in general, deterioration in memory and attention.

The mechanisms of development of cognitive impairment in patients after COVID-19 are actively discussed in literature. Among the possible versions are development of vascular endothelial dysfunction, activation of the kallikrein-bradykinin system, leading to a decrease in blood flow, immunological disorders associated with the disease [8,9]. In severe cases of COVID-19, direct damage to the brain by the virus is possible. Thus, SARS-CoV-2 was detected in the cerebrospinal fluid of a patient with viral encephalitis and was observed during autopsy in nerve and capillary endothelial cells of the brain tissue [10,11]. Angiotensin-converting enzyme (ACE-2), the main receptor for SARS-CoV-2, is highly expressed by endothelial cells and pericytes throughout the body [12,13]. An analysis of public databases indicates that ACE-2 is also expressed in the brain (temporal lobe, hippocampus), those areas of the brain that are involved in the process of cognition and memory and are affected in Alzheimer's disease [14, 15]. ACE-2 reduces the risk of stroke and dementia [16]. If intake of SARS-CoV-2 leads to loss of ACE-2, this may increase the risk of cerebrovascular and neurological disorders in patients with COVID-19 and lead to cognitive deficits. However, this mechanism requires further study. Brain hypoxia may be one of the key mechanisms for the development of cognitive impairment after COVID-19. It is known that the white matter of the brain is especially vulnerable to changes in cerebral blood flow, which decreases due to the development of diffuse dysfunction of small vessels in COVID-19 [17]. Damage to the white matter of the brain can lead to the development of cognitive impairment [18,19]. Impaired functional integrity in areas of the brain such as the hippocampus at a 3-month follow-up in patients recovered from COVID-19 was associated with memory loss [20]. Pandemics lead to high levels of stress, and infection control measures such as quarantine and social distancing can further damage mental health. Observations of other epidemics or pandemics (eg, 2003 severe acute respiratory syndrome, 2009 H1N1 pandemic, 2014 Ebola epidemic) have shown significant adverse effects on mental health in a large population [21,22]. Similarly, after the outbreak of COVID-19, there is an increase in anxiety levels [23,24]. This was reflected in our study (58.3% of patients after COVID-19 complained of anxiety).

Conclusion

Thus, in our study, in patients after COVID-19, there was a deterioration in cognitive functions in general, a decrease in memory and attention, and an increase in anxiety levels.

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DOI 10.34660/INF.2022.31.56.020

INFLUENCE OF INTENSIVE THERAPY ON THE HEMODYNAMICS OF PATIENTS DURING THE PERIOD OF BURN TOXEMIA IN CHILDREN OLDER THAN SEVEN YEARS

Muhitdinova Hura Nuritdinovna
Doctor of Medical Sciences, Full Professor
Center for the Development of Professional Qualifications of Medical Workers

Abstract. *With a burn area of 2-3A degree 41±11%, 3B degree 6.6±6%, IF 57±11 units in children older than 7.1 years during the period of toxemia, an increase in the cardiotonic effects of dopamine was revealed through a decrease in HR and BR, AVT (sympathetic influences) with a positive effect on hemodynamics with the transfer of cardiac function to an economically less expensive way of energy metabolism of cells with a decrease in MVP. Increase in mesor GPVR on days 4,5, circadian rhythm SBP on day 8, DBP on day 9, HR on days 7,8,9, MVP on days 7,8,9 and especially AVT by 84%, 115% on days 8,9 indicated an increase in hypersympathotonic activity by the end of the first week of burn toxemia.*

Keywords: *intensive care, burn toxemia, hemodynamics, children older than seven years.*

Relevance

Mortality among children with body burns has recently decreased to 1.86%; however, it remained relatively high in children - 6.8% [1-4]. Due to the ambiguous approach to the feasibility of a complex introduction of a multidirectional mechanism of action of drugs, the doctor often makes a decision without a clear understanding of the dynamics and features of the pathogenetic mechanisms of the development of organ failure in burn disease in children.

Purpose of the work

To study the effect of intensive care on the hemodynamics of patients during the period of toxemia in children older than seven years.

Material and research methods

The clinical material is presented by hourly monitoring of body temperature, hemodynamic parameters: heart rate (HR), impact volume (IV), cardiac output (CO), general peripheral vascular resistance (GPVR), estimation of autonomic tone (EAT), the need of myocardium in oxygen (TNMO), breathing rate (BR), oxyGPVR gen saturation (OS) in 12 children admitted to the republican scientific

center for emergency medical aid (RSCEMA) due to thermal burns at the age of 7.1-18 years.

Results and its discussion.

Table 1.

Characteristics of patients aged 7.1-18 years (12 patients) admitted with thermal burns

Age	Area of 2-3A degree burns in%	3 B degree	IF, units	In ICU, days
11.4±3.2	41±11	6.6±6	57±11	7.3±1.1

Table 2.

Evaluation of the treatment of patients with burn toxemia of moderate severity at the age of 7.1-18 years

days	Kcal.	Intravenous. liquid	Amino acids in ml.	Protein, ml.	Num. of solut. types	Anesthesia, introduction freq.	Anti-inflammatory, freq.	A/B, freq	Anticoagulant, freq.	Vitamin C, freq.	Cytoflavin, ml	Vasodilators, freq.	Dopamine, freq.
1	293 ±122	2657 ±862	70.8 ±18	25.4 ±6.	4.5 ±0.6	8.3 ±2.0	9.7 ±2.4	2.3 ±0.9	3.1 ±0.8	1.2 ±0.7	0	3.3 ±1.0	0.3 ±0.1
2	280 ±150	2813 ±886	129 ±150	69.2 ±9.2	5.1 ±1.1	7.5 ±2.9	7.1 ±2.4	2.9 ±0.8	4.0 ±0.3	2.0 ±0.7	1.7 ±0.8	3.2 ±1.2	0.5 ±0.1
3	233 ±92	2487 ±755	258 ±184	150 ±133	5.5 ±1.2	7.8 ±3.1	7.4 ±2.1	2.8 ±1.0	3.9 ±0.3	2.4 ±1	4.2 ±1.6	3.0 ±1.3	0.5 ±0.2
4	196 ±108	2267 ±629	357 ±141	40 ±16	4.6 ±0.9	7.6 ±1.9	7.4 ±2.5	2.8 ±1.0	3.5 ±1.0	2.3 ±1.0	4.5 ±1.5	3.2 ±1.0	0.4 ±0.1
5	261 ±99	2203 ±609	313 ±169	96 ±15	5.3 ±0.6	8.1 ±3.2	7.5 ±2.1	3.0 ±1.3	3.8 ±0.4	2.8 ±1.4	5.5 ±1.0	3.1 ±1.4	0.3 ±0.1
6	210 ±75	2260 ±577	381 ±98	66 ±6	5.4 ±0.6	8.1 ±2.1	7.8 ±2.1	3.4 ±1.4	3.9 ±0.2	3.5 ±1.1	6.9 ±1.9	3.5 ±1.1	0.3 ±0.1
7	148 ±19	2070 ±544	355 ±134	40 ±6	4.8 ±0.6	6.6 ±1.9	7 ±1.6	2.8 ±1.3	3.2 ±0.9	2.2 ±0.8	2 ±0.3	2.8 ±0.6	0
8	160 ±20	2506 ±471	466 ±44.4	66.7 ±8.9	5.3 ±0.4	9.3 ±4.4	8.3 ±1.1	3.3 ±0.9	4.0 ±1.0	2.3 ±1.8	3.3 ±0.4	3.3 ±1.8	0

The volume of intensive care corresponded to the recommendations of other authors on the management of children with severe thermal injuries during the period of toxemia (tab. 2). Thus, the volume of intravenous infusion ranged from

2657±862 ml on day 1, with some decrease to 2070±544 ml and an increase on day 8 to 2506±471 ml/day. The volume of parenterally administered glucose at a cost of 293±122 kcal gradually decreased to 148±19 kcal on the 7th day. If on the 1st day the minimum amount of amino acid solutions was administered (70.8±18 ml/day), then on the 8th day there was a need to increase to 466±44.4 ml/day. The number of protein media per day was limited due to the need for corrective measures to remove from shock up to 25.4±6 ml/day, followed by an increase in albumin transfusion up to 150±133 on day 3 and up to 8 days 66.7±8.9 ml/day. The qualitative composition of infusion therapy did not change significantly, averaging 4.5-5.5 items of colloids and crisalloids. Also, during the first 8 days of the period of toxemia of burn disease, the frequency of administration of painkillers, anti-inflammatory drugs, antibiotics, anticoagulants, metabolite drugs, vasodilators did not change significantly, with a complete cessation of dopamine administration on day 7 (tab. 2). A special feature is volumetric parenteral infusion therapy by the method of forcing diuresis, aimed at detoxifying the body, which allowed not only the timely replacement of fluid losses through the burn surface, but also corrected perfusion disorders and prevented the development of an energy-deficient state of healthy and reversibly damaged cells of the body, allowing to improve the regenerative capabilities of those damaged by thermal burns on skin surface with a burn area of 2-3A degree 41±11%, 3B degree 6.6±6%, IF 57±11 units.

Table 3.

Changes in hemodynamic parameters

Days	SBP, mmHg	DBP, mmHg	CO, l/ min.	GPVR, dyn.s.cm^5	AVT, units	BR per min.	HR per min.	MVP, %
1	112±3	63±2	4.2±0.3	1052±108	1.55±0.08	21.3±0.8	106±3	121±4
2	116±2	65±1	4.2±0.2	1057±50	1.58±0.05	21.2±0.3	107±2	125±2
3	115±1	65±1	4.1±0.1	1162±51	1.58±0.04	21.1±0.2	107±2	125±2
4	115±2	66±1	3.9±0.2	1209±38*	1.56±0.07	22.1±0.4	110±2	127±4
5	113±2	64±1	4.0±0.2	1342 ±101*	1.58±0.06	22.3±0.3	111±2	126±3
6	114±1	65±1	4.4±0.2	1207±74	1.61±0.05	22.3±0.2	112±2	128±2
7	114±2	66±2	3.8±0.3	1189±75	1.58±0.07	23.0±0.7	117±2*	134±3*
8	122±3*	65±23	3.4±0.4	1153±70	1.84 ±0.13*	22.1±0.9	117±4*	143±6*
9	126±49	70±2*		1175±116	2.15 ±0.25*	23.8 ±0.7*	130±5*	173±10*

*-significant relative to the indicator on the first day

As shown in tab. 3, on the first day in children older than 7.1 years with burns of 2-3A degrees with an area of 41±11%, 3B degrees of 6.6±6%, IF 57±11 units, there were no significant deviations from age normative values of mesors of the circadian rhythm SBP, DBP, CO, GPVR with a slight tendency to increase respiration and heart rate with an increase in AVT by 55%, MVP by 21%. The found indicators characterized the sympathotonic reaction on the first day to a thermal burn of 2-3A degree with an area of 41±11%, 3B degree 6.6±6%, IF 57±11 units, when, due to the consistency of compensatory reactions, CO, GPVR, SBP, DBP, respiration frequency did not change significantly. However, a significantly significant increase in GPVR mesor on days 4,5, circadian rhythm SBP on day 8, DBP on day 9, HR on days 7,8,9, MVP on days 7,8,9 and especially AVT by 84%, 115% on days 8,9 indicated an increase in hypersympathotonic activity by the end of the first week of burn toxemia. The latter was most likely due to insufficiently effectively suppressed systemic inflammatory response to burn damage to the skin surface, what should be taken into account in the process of preventive measures of a high probability of progression with the emergence of new foci of infections with the development of the first failure of the compensatory function of organs (hemodynamics) with the transition to the stage of decompensation and irreversible changes, including the myocardium, parenchymal organs, the development of multiple organ failure syndrome, worsening prognosis.

Table 4.

Correlations of intensive care and hemodynamic parameters

kcal/ Intrav. liq.	0.62	amino ac-s/ CO	-0.59	AB/ CO	-0.23	anesthesia/CO	-0.29	dopamine/CO	0.65	cytoflavin/CO	0.14
kcal/ CO	0.66	amino ac-s/ GPVR	0.61	AB/ GPVR	0.42	anesthesia/ GPVR	-0.05	dopamine/ GPVR	-0.24	cytoflavin/ GPVR	0.76
kcal/ GPVR	-0.29	amino ac-s/ AVT	0.61	AB/ AVT	0.62	anesthesia/ AVT	0.71	dopamine/ AVT	-0.60	cytoflavin/ AVT	0.10
kcal/ AVT	-0.51	amino ac-s/ BR	0.70	AB/ BR	0.38	anesthesia/BR	-0.25	dopamine/ BR	-0.78	cytoflavin/BR	0.34
kcal/ BR	-0.72	amino ac-s/ HR	0.83	AB/ HR	0.57	anesthesia/HR	0.06	dopamine/HR	-0.93	cytoflavin/HR	0.22
kcal/ HR	-0.88	amino ac-s/ MVP	0.79	AB/ MVP	0.62	anesthesia/ MVP	0.32	dopamine/ MVP	-0.81	cytoflavin/ MVP	0.11

kcal/ MVP	-0.83	Intrav. liq./CO	0.19	hepa-rin/CO	-0.04	Antiin-flam-matory/ CO	0.03	vasodila-tors/CO	0.26	metabo-lite/CO	0.14
pro-teins/ CO	0.10	Intrav. liq./ GPVR	-0.80	hepa-rin/ GPVR	0.18	Antiin-flam-matory/ GPVR	-0.39	vasodi-lators/ GPVR	-0.20	me-tabolite/ GPVR	0.69
pro-teins/ GPVR	0.29	Intrav. liq./ AVT	0.10	hepa-rin/ AVT	0.46	Antiin-flam-matory/ AVT	0.17	vasodi-lators/ AVT	0.31	me-tabolite/ AVT	0.16
pro-teins/ AVT	0.04	Intrav. liq./BR	-0.87	hepa-rin/ BR	-0.25	Antiin-flam-matory/ BR	-0.32	vasodila-tors/BR	-0.23	metabo-lite/BR	0.44
pro-teins/ BR	-0.36	Intrav. liq./HR	-0.61	hepa-rin/HR	0.01	Antiin-flam-matory/ HR	-0.24	vasodila-tors/HR	-0.16	metabo-lite/HR	0.36
pro-teins/ HR	-0.22	Intrav. liq./ MVP	-0.27	hepa-rin/ MVP	0.25	Antiin-flam-matory/ MVP	-0.13	vasodi-lators/ MVP	-0.03	me-tabolite/ MVP	0.22

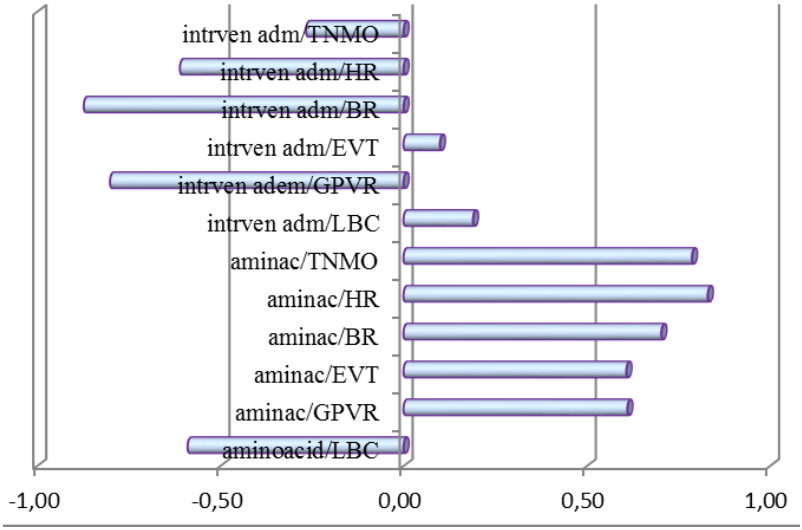

Figure 1.

A direct correlation was found between the amount of amino acids and MVP, HR, BR, AVT, GPVR (tab. 2), that is, an increase in intravenous administration of amino acids was accompanied by a tendency to increase respiration, heart rate, an increase in MVP and GPVR (fig. 1). Perhaps this was due to the optional observance of the minimum rate of administration, perhaps due to the need for a sufficiently volumetric infusion therapy.

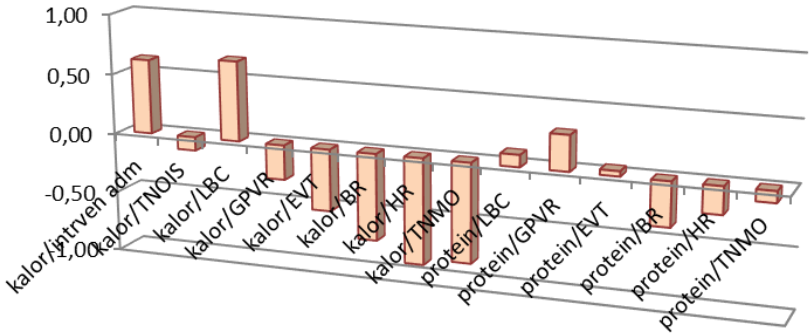

Figure 2.

A tendency to a decrease in HR, MVP, AVT and a tendency to an increase in CO were revealed with the introduction of hypertonic (10-20%) glucose solutions (fig. 2).

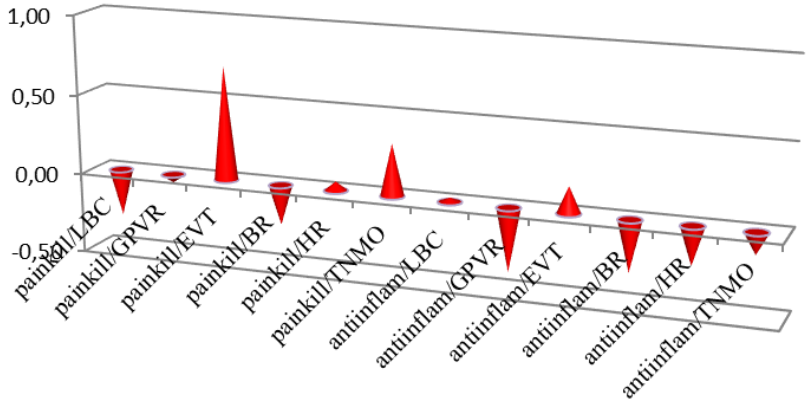

Figure 3.

The use of painkillers (including sedatives) contributed to a slight increase in AVT and MVP, while anti-inflammatory drugs decreased GPVR, BR (fig. 3, tab. 4).

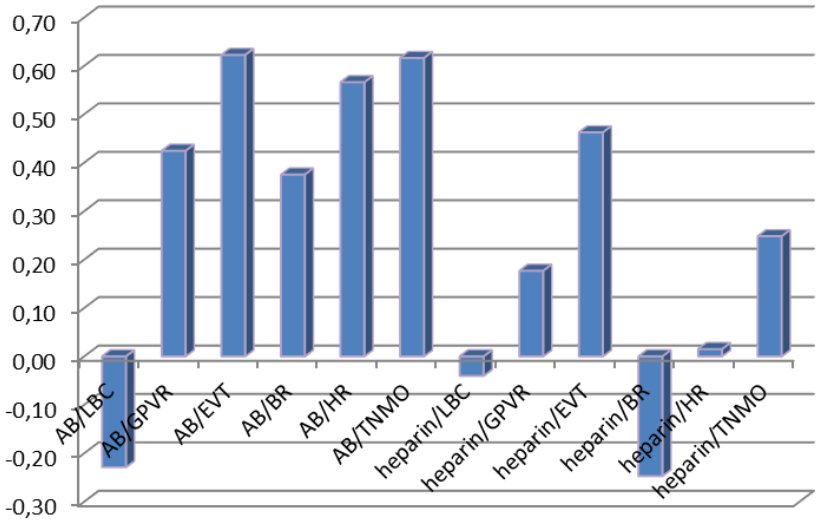

Figure 4.

The direct positive relationship of AB therapy with AVT, HR, BR, GPVR seems to be due to the need for current correction of AB administration in conditions of exacerbation of signs of an inflammatory response. It is also possible to explain the direct relationship between the frequency of administration of heparin and AVT (fig. 4, tab. 4).

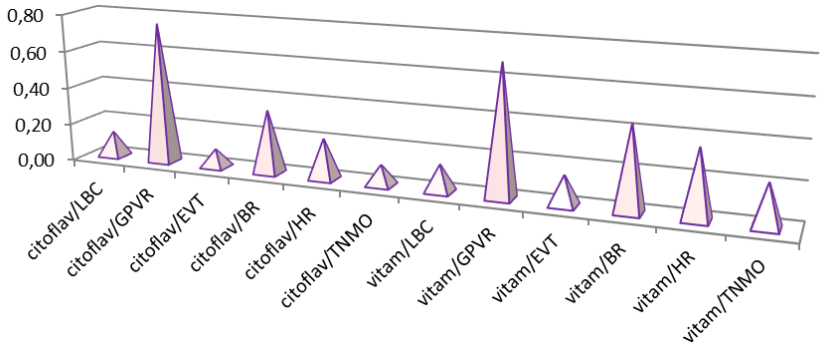

Figure 5.

A direct correlation was found between the amount of injected cytoflavin and GPVR, as well as metabolite drugs (Vit.C., B1, B6) and GPVR (fig. 5, tab. 4), which can be regarded as the effect of the studied drugs stimulating the intensity of metabolism.

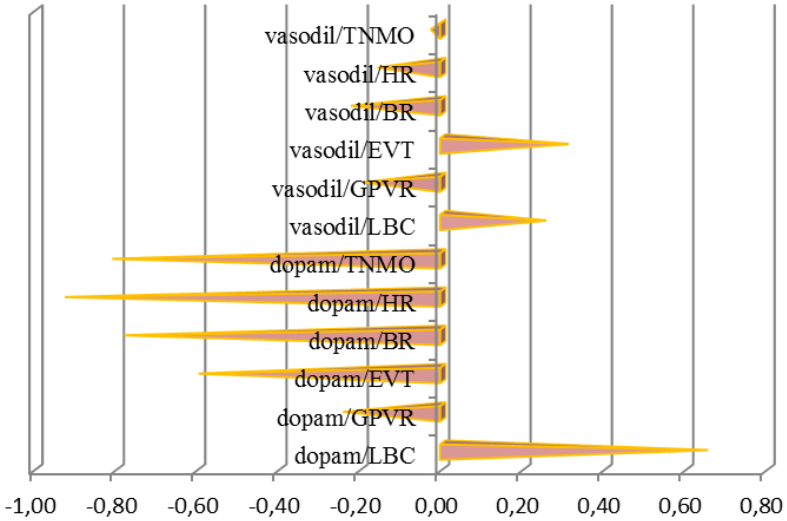

Figure 6.

The inverse correlation of dopamine and MVP, dopamine and HR, and BR can be represented as a tendency to slow down the heart rate, with a decrease in MVP and BR, AVT with a direct correlation of dopamine and CO can be understood as an increase in the cardiotonic effects of the drug by reducing HR and BR, AVT (sympathetic influences) had a positive effect on hemodynamics by transferring the work of the cardiac function to an economically less expensive way of energy metabolism of cells with a decrease in MVP (fig. 6, tab. 4).

Conclusion

With a burn area of 2-3A degree 41±11%, 3B degree 6.6±6%, IF 57±11 units in children older than 7.1 years during the period of toxemia, an increase in the cardiotonic effects of dopamine was revealed through a decrease in HR and BR, AVT (sympathetic influences) with a positive effect on hemodynamics with the transfer of cardiac function to an economically less expensive way of energy metabolism of cells with a decrease in MVP. Increase in GPVR mesor on days 4,5, circadian rhythm SBP on day 8, DBP on day 9, HR on days 7,8,9, MVP on days 7,8,9 and especially AVT by 84%, 115% on days 8,9 indicated an increase in hypersympathotonic activity by the end of the first week of burn toxemia.

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DOI 10.34660/INF.2022.93.42.021

AGE FEATURES OF INTENSIVE CARE OF THE MOST SEVERE BURN TOXEMIA IN CHILDREN

Muhitdinova Hura Nuritdinovna
Doctor of Medical Sciences, Full Professor
Center for the Development of Professional Qualifications of Medical Workers

Abstract. *The most severe condition was observed upon admission to the clinic in children of group 2 (3.1-7 years old with IF-127.5±33.3 units), group 3 (over 7.1 years old 95.8±19.1 units), and 71.3±8.4 units in group 1 (up to 3 years). The greatest frequency of administration of antibacterial drugs was found in children of the 1st group (4-5.5 times a day). The duration of intensive therapy for the period of severe toxemia, despite the differences in the area and depth of damage to the skin surface, was 26.3±2.4 days in group 1, 27.3±3.2 in group 2, and 28.8±4.8 days in group 3. The relatively greater use of vasodilators on days 17-28 in children of group 2 can be associated with a more severe stress response to a larger area and depth of skin surface burn damage in children of group 2. The frequency of administration of the vasopressor corresponded to the severity and depth of damage to the skin surface, which turned out to be the greatest in children of pre-preschool age.*

Keywords: *intensive care, severe burn toxemia, children*

Relevance

The period of toxemia in severe burns occurs within a few hours or within the first day after the burn. Along with the pain factor during this period, the phenomena of intoxication of the body come to the fore. Despite the large number of studies in combustiology, the recommendations are mostly general in nature, do not take into account age characteristics, the severity of burn toxemia [1-4].

Purpose of the work

To assess the age characteristics of intensive care for the most severe burn toxemia.

Material and research methods

In total, the data of studies of 21 children in three age groups were studied: group 1 - 10.1±2.1 months (8 patients), group 2 - 4.4±0.6 years, group 3 - 9.7±1.5 years. Patients were considered depending on the severity and area of damage, age, and the duration of treatment in the ICU for more than 21 days. The severity

of the burn was assessed by calculating the surface area of the damaged skin and using the Frank index. A detailed analysis of reliably significant deviations, intergroup differences of the studied indicators was carried out. Intensive care from the moment of admission was aimed at recovery from burn shock, adequate pain relief and intravenous administration of crystalloids, volemic and other solutions under the control of hemodynamics, diuresis volume.

Results and discussion

As shown in table 1, among 21 patients who were in intensive care in the ICU for more than 21 days, 8 were aged 10.1±2.1 months, 7 - 4.4±0.6 years, 6 - 9.7± 1.5 years. In the 1st and 3rd age groups, the areas of the burn surface of 2-3A degrees were almost equal. The largest area of 2-3A degree burn damage to the skin surface was found in children of the 2nd group, exceeding the 1st group by 121%. Deeper damage to the skin was also found in children of the 2nd group, amounting to 36.7±13.3%, that is, 6 times more than in children of the 1st group and 63% more than in the 3rd group. The most severe condition according to IF was observed upon admission to the clinic in children of group 2, IF-127.5±33.3 units, group 3 95.8±19.1 units, and 71.3±8.4 units in group 1. The duration of intensive care for the period of toxemia, despite significant differences in the area and depth of damage to the skin surface, did not differ significantly, amounting to 26.3±2.4 days in group 1, 27.3±3.2 in group 2, and 28.8±4.8 days in group 3.

Table 1.

Characteristics of pediatric patients admitted with very severe thermal burns

Age groups	Number of patients	Age	2-3 A degrees, %	3 B	IF, units	Number of days in hospital	Number of days in ICU
1	8	10.1±2.1 months	26.7 ±2.2	6±2.7	71.3±8.4	49.3±3.8	26.3±2.4
2	7	4.4±0.6 years	59.2 ±12.2	36.7 ±13.3	127.5 ±33.3	61.8±13.5	27.3±3.2
3	6	9.7±1.5 years	25.8 ±11.4	22.5 ±6.6	95.8 ±19.1	65.4±21.6	28.8±4.8

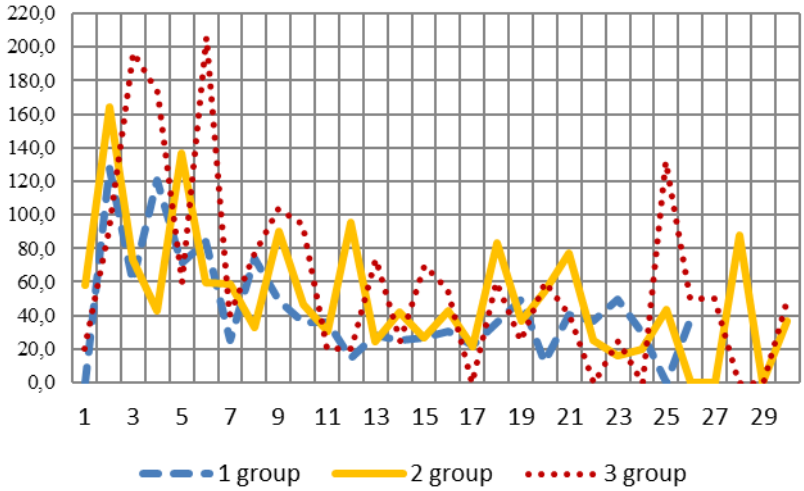

Figure 1. *Introduced protein solutions in ml/day*

The largest volume of albumin transfusion in all children was observed on days 2-6, averaging 120 ml in group 1, 160 ml in group 2 and 200 ml in group 3 (fig. 1). On the following days, the youngest children received 20-40 ml of albumin per day, children in group 2 - 80-20 ml, and in group 3 - up to 60 ml.

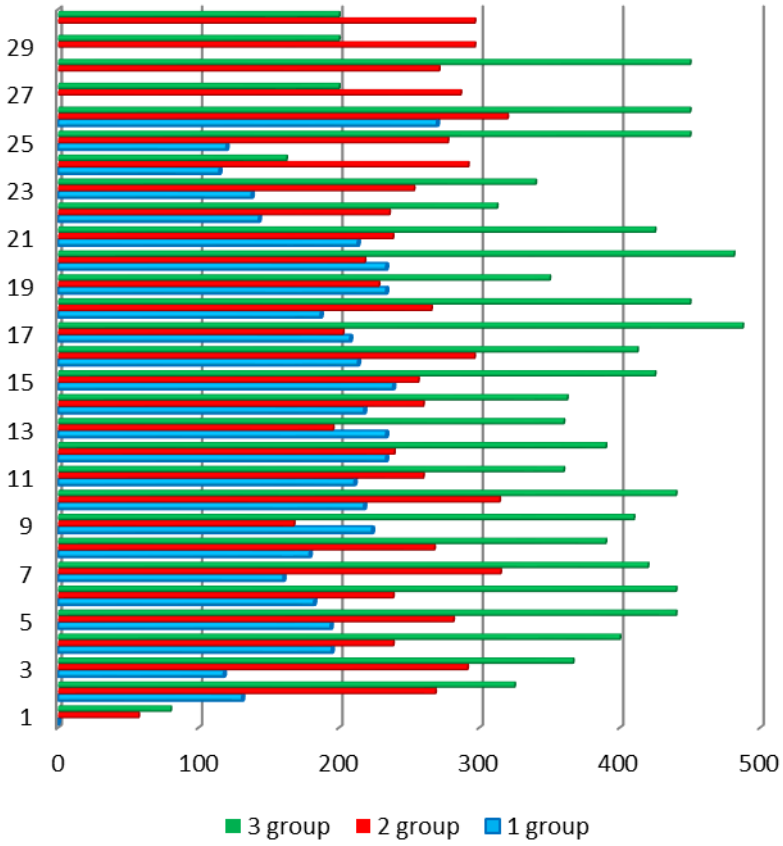

Figure 2. *Amino acid solutions introduced, ml/day*

Additional parenteral nutrition was carried out by introducing amino acids with energy replenishment with hypertonic glucose solutions (energy value was estimated by calorie content). The children of the youngest group received an average of 100-200 ml of amino acids, in group 2 - an average of 250 ml/day and in group 3 - 400 ml/day (fig. 2). Additional parenteral nutritional support led to a significant reduction in the need to administer protein preparations to correct protein metabolism disorders caused by losses through the damaged skin surface, toxic hepatitis, as a rule, accompanied by severe burn toxemia.

In general, the volume of intravenous infusion therapy was determined not only by age, body weight, area and depth of the burn surface, but also by individual aggravating factors that often occurred during the period of toxemia, such as hemo-

coagulation disorders, a decrease or increase in circulating blood volume (CBV), intoxication, or exacerbation of the systemic inflammatory reaction caused by a secondary infection or late necrectomy, transient dysfunction of the gastrointestinal tract, secondary enterocolitis, toxic anemia (fig. 3). The volume of intravenous daily infusion under conditions of enteral feeding averaged 700-1000 ml in group 1, 1200-1600 ml in the second group, and 1500-2000 ml/day in the third group, with a slight tendency to decrease by the 30th day of intensive therapy.

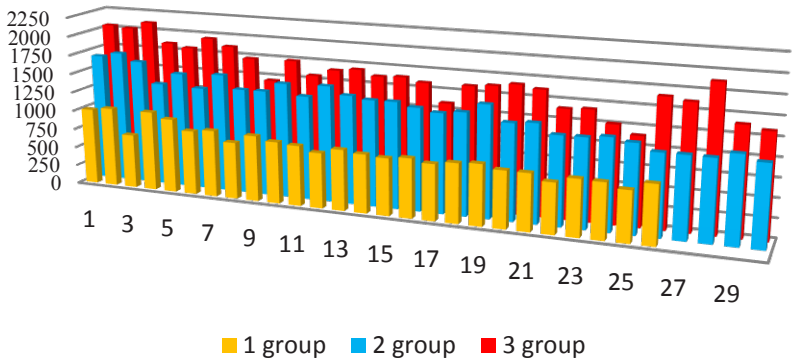

Figure 3. *Volume of daily intravenous infusion, ml/day*

The caloric intake presented in fig. 4 served as an addition to the basic enteral nutrition, was carried out within the limits of 150 kcal/day in the 1st group, 200 kcal/day in the second, and about 150 kcal in the third group of patients.

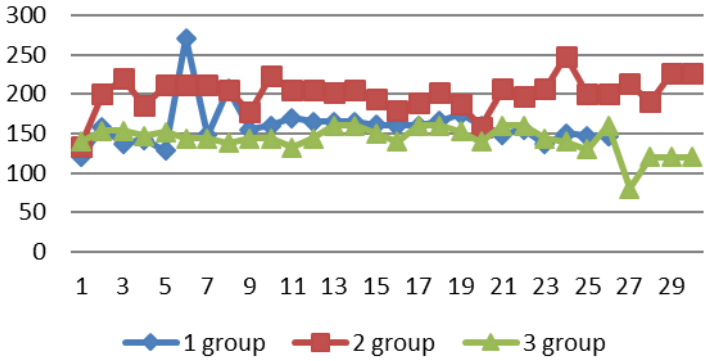

Figure 4. *Introduced calories intravenously per day*

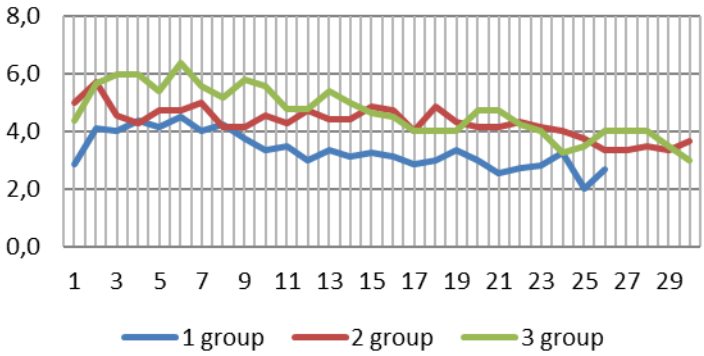

Figure 5. *Number of types of solutions*

The number of types of solutions during infusion therapy was more limited in group 1 (3-4), the largest in group 3 on days 3-6, amounting to 6-7 types. The revealed difference, apparently, is due to the anatomical and physiological characteristics of the inflammatory response in infants, which led to the expediency of limiting parenteral fluid administration.

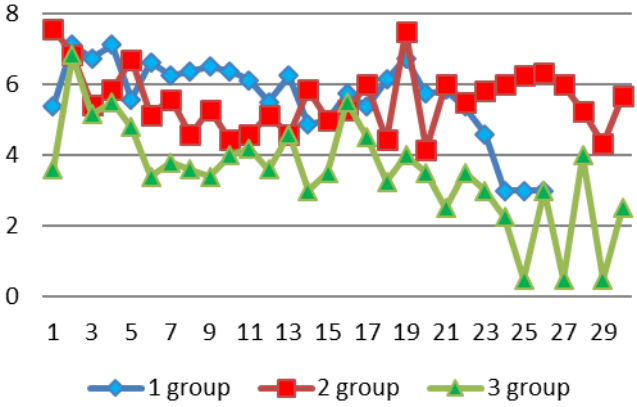

Figure 6. *Painkillers, frequency of administration per day*

The trend towards relatively greater administration of painkillers (including sedatives) in the first 11 days in infants, compared with older children, was due to a high risk of generalization of an excessive stress, inflammatory reaction, and a tendency to convulsive readiness. The latter was prevented by ongoing analgesic, sedative therapy in children (fig. 6). Attention is drawn to the least administration

of painkillers (sedatives) in school-age children. Given the severity and extent of the damaged skin surface, a slight increase in the activity of analgesic therapy would probably contribute to an increase in the effectiveness of general therapy in the studied pediatric patients.

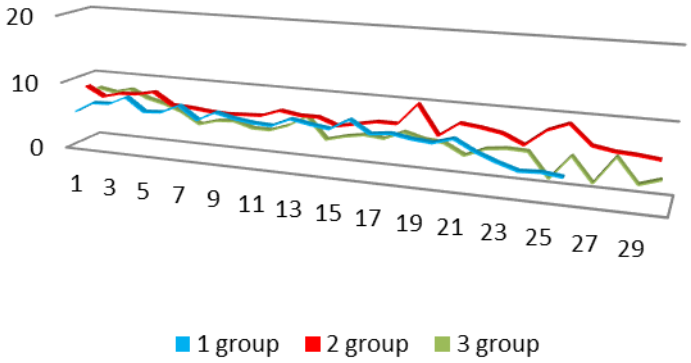

Figure 7. *Anti-inflammatory, frequency of administration per day*

More pronounced anti-inflammatory therapy (fig. 7) in group 2 at a later date of toxemia draws attention (at 18-19, 26 days), which is most likely associated with a secondary exacerbation of the inflammatory reaction due to a larger area of deeper skin lesions (grade 3B - 36.7 ± 13.3%, IF - 127.5 ± 33.3 units).

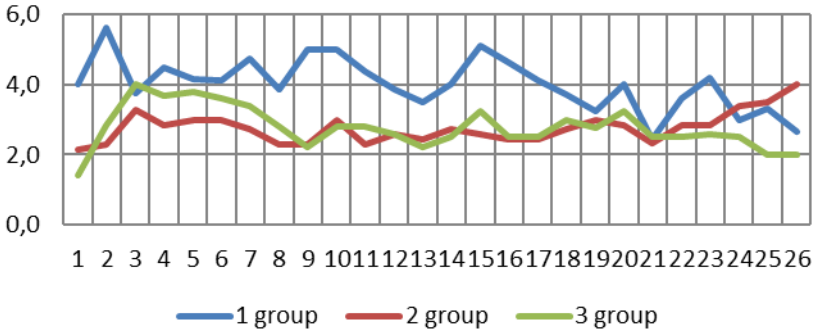

Figure 8. *Frequency of administration of antibiotics*

The greatest frequency of administration of antibacterial drugs was found in children of the 1st group (4-5.5 times a day) (fig. 8).

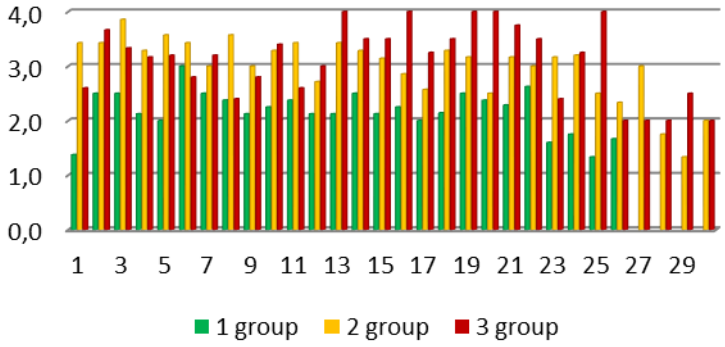

Figure 9. *Heparin, frequency of administration per day*

The frequency of heparin administration in group 1 averaged 2-3 times a day, in group 2 - 3 times a day), increasing up to 4 times in children of group 3 (fig. 9).

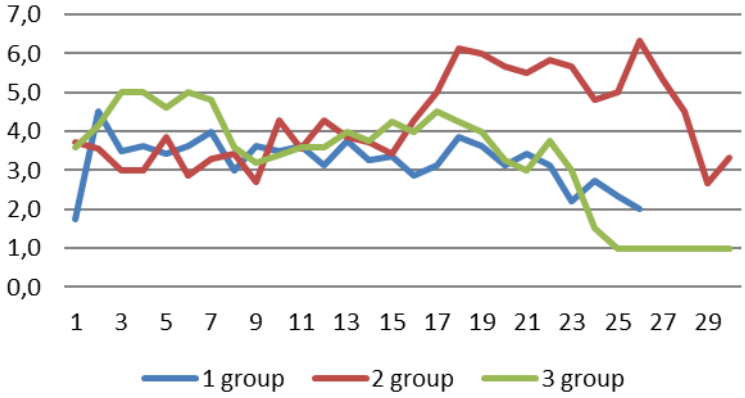

Figure 10. *Vasodilators*

The relatively greater use of vasodilators on days 17-28 in children of the 2nd group can be associated with a more severe stress reaction to a larger area and depth of skin surface burn damage in children of the 2nd group (fig. 10).

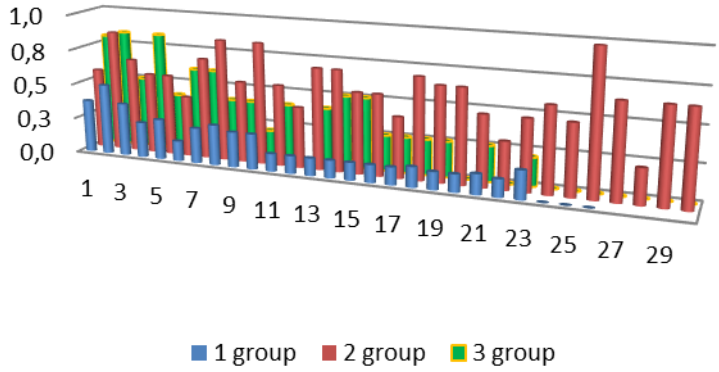

Figure 11. *Dopamine, frequency of administration*

The frequency of administration of the vasopressor corresponded to the severity and depth of damage to the skin surface, which turned out to be the greatest in children of pre-preschool age (group 2) (fig. 11).

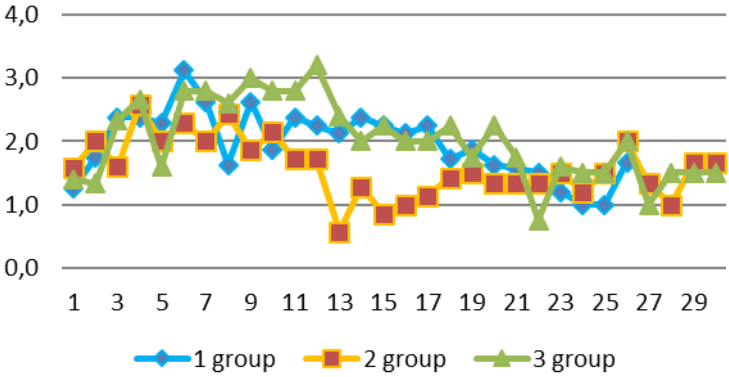

Figure 12. *Vitamin C, frequency of administration per day*

It is possible that an increase in the administration of vitamin C on days 13-17 would probably make it possible to obtain better results of anti-inflammatory, supporting the body's defenses in children under 7 years of age, to achieve more effective results of restoring intensive therapy (fig. 12).

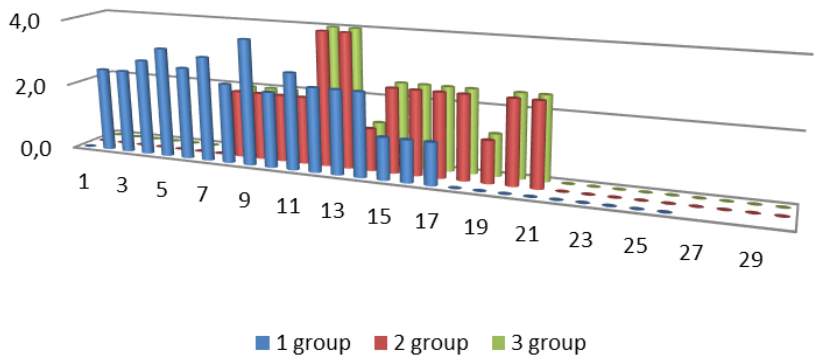

Figure 13. *Cytoflavin, ml/day*

Also, earlier and longer administration of relatively large amounts of cytoflavin would also improve the effects of the ongoing volumetric complex multifocal intensive therapy of very severe burns with IF in group 1 - 71.3 ± 8.4 units, in group 2 - 127.5 ± 33.3 units, in group 3 - 95.8±19.1 units.

Conclusion

The most severe condition according to IF was observed upon admission to the clinic in children of the 2nd group (3.1-7 lut_, IF-127.5±33.3 units, 3 groups 95.8±19.1 units, and 71.3±8.4 units in group 1. The greatest frequency of administration of antibacterial drugs was found in children of the 1st group (4-5.5 times a day). The duration of intensive care for the period of toxemia, despite significant differences in the area and depth of damage to the skin surface, was 26.3±2.4 days in group 1, 27.3±3.2 in group 2, and 28.8±4.8 days in group 3. The relatively greater use of vasodilators on days 17-28 in children of the 2nd group is associated with a more severe stress response to a larger area and depth of skin surface burn damage in children of the 2nd group. The frequency of administration of the vasopressor corresponded to the severity and depth of damage to the skin surface, which turned out to be the greatest in children of pre-preschool age.

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DOI 10.34660/INF.2022.22.77.022

ANALYSIS OF NUTRITIONAL STATUS IN PREMATURE INFANTS WITH VARIOUS TYPES OF FEEDING THOSE

Tatiana E. Taranushenko
Doctor of Medical Sciences, Full Professor
Krasnoyarsk State Medical University
named after Professor V. F. Voyno-Yasenetsky
ORCID: 0000-0003-2500-8001
Tatiana V. Ovchinnikova
neonatologist
Center for Maternity and Childhood Protection
ORCID: 0000-0002-9319-2894
Ekaterina V. Antsiferova
Associate Professor
Krasnoyarsk State Medical University
named after Professor V. F. Voyno-Yasenetsky
neonatologist
Center for Maternity and Childhood Protection
ORCID: 0000-0002-5179-3122
Lika S. Karpova
student
Krasnoyarsk State Medical University
named after Professor V.F. Voyno-Yasenetsky
Russia, Krasnoyarsk

Abstract. *Purpose of the study. Study the indicators of nutritional status (hemoglobin, total protein, albumin, creatinine, urea, glucose in blood plasma) at birth, in dynamics on the 10th, 20th, 30th day of life in premature newborns with very low and low birth weight at birth. Various types of feeding (breast milk, breast milk in combination with a fortifier and artificial feeding) to assess the ongoing measures for successful feeding and the quality of nursing.*

Materials and methods. *A survey of 118 children aged from birth to 1 month of life, who were divided into groups depending on the type of feeding.*

Conclusion. *The study made it possible to present laboratory parameters (hemoglobin, total protein, albumin, creatinine, urea, blood glucose in blood plasma) that characterize the nutritional status of premature infants with very*

low and low birth weight on various types of feeding (breast milk, breast milk in combination with a fortifier and artificial feeding) and propose measures aimed at optimizing feeding in the neonatal period.

Keywords: *nutritional status, premature infants, breastfeeding, fortified breast milk, artificial feeding, very low body weight, low body weight*

Introduction

Nursing and development of newborns born prematurely is a difficult task of modern perinatology. One of the main factors determining the normal growth and development of newborns (especially premature ones) is full feeding [1-3]. The assessment of nutritional adequacy includes not only anthropometric data in dynamics, but also an analysis of nutritional tolerance and, according to indications, a set of laboratory studies, of which the most important are clinical laboratory results (hemoglobin and traditional erythrocyte evaluation parameters) and biochemical parameters characterizing protein metabolism (including an indirect method for assessing visceral protein reserves by the level of urea), iron availability, vitamin status, etc. In the modern scientific literature, data on the nutritional status of premature infants in the neonatal period on different types of feeding are very few and contradictory, which determines the need to continue research on this issue [4, 5].

Purpose of the study – study the indicators of nutritional status (hemoglobin, total protein, albumin, creatinine, urea, glucose in blood plasma) at birth, in dynamics on the 10th, 20th, 30th day of life in premature newborns with very low and low birth weight at birth. Various types of feeding (breast milk, breast milk in combination with a fortifier and artificial feeding) to assess the ongoing measures for successful feeding and the quality of nursing.

Materials and methods

A survey of 118 children aged from birth to 1 month of life was carried out in the department of pathology of newborns and premature babies of the Krasnoyarsk Regional Clinical Center for Maternity and Childhood Protection. The first group included 50 children with very low body weight (VLBW), at birth, 3 subgroups were distinguished depending on the type of feeding: breast-fed (BF) 17 children, on "fortified" breast milk with the addition of a fortifier (BF+F) 17 children, 16 children on artificial feeding (AF), in the second group – 68 children with low birth weight (LBW), respectively, 36 children on breastfeeding, 12 children on BF+F, 20 children on AF.

Results and discussion

Evaluation of the nutritional status of children with VLBW has established predominant changes in AF in the form of the development of early anemia of prematurity (10% of cases), high total protein levels in children by the end of the observation period, combined with an increase in urea at all stages of observation and an increase in creatinine levels on day 20 life. In the group of newborns

with LBW, comparable data were obtained on the incidence of early anemia of prematurity between subgroups on different types of feeding and lower levels of total protein, albumin and urea in the subgroup of children receiving BF+F. Lower levels of total protein, albumin and urea were found in children receiving breast milk in combination with a fortifier (with comparable values of the indicated laboratory parameters in children on breast and formula feeding). It is important that in children on "fortified" breast milk, the worsened indicators of protein metabolism were combined with lower body weight and calculated indicators of weight gain at various stages of observation. The most likely explanation for the obtained features of protein metabolism may be insufficient intake of the protein substrate with food, impaired protein absorption, dysregulation of protein metabolism against the background of concomitant pathology, etc. At the same time, it should be recognized that the fortification of breast milk in routine practice is characterized by standard approaches without taking into account the recommendations (instructions) for analyzing the composition of breast milk, without agreement with a specialist on the need to prescribe a "fortifier" at home, without resolving the issue of the admissibility of taking this product. (burdened history of allergy to cow's milk proteins), etc. In connection with this, an individual approach to fortification is optimal, focused on the actual composition of breast milk (target, target option) and / or assessment of the metabolic “response” of the child (indicators of protein metabolism).

Conclusion

The study made it possible to present laboratory parameters (hemoglobin, total protein, albumin, creatinine, urea, blood glucose in blood plasma) that characterize the nutritional status of premature infants with very low and low birth weight on various types of feeding (breast milk, breast milk in combination with a fortifier and artificial feeding) and propose measures aimed at optimizing feeding in the neonatal period.

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DOI 10.34660/INF.2022.50.50.023

PSYCHOLOGICAL PRECONDITION FOR THE FORMATION OF CLINICAL AND PSYCHOVEGETATIVE PHENOTYPES OF UNDERGROUND MINERS

Maliutina Natalia Nikolaevna
Doctor of Medical Sciences, Full Professor
Paramonova Svetlana Vasilievna
Department Assistant
Perm State Medical University named after Academician E.A. Wagner

Abstract. *The labor activity of underground miners is accompanied by a complex effect of physical, chemical industrial hazards, along with the influence of psychological and psychosocial factors that create conditions for the formation of psychovegetative dysfunction and stress-related somatic diseases, primarily arterial hypertension syndrome (AH). An increase in age, length of service and exposure to a complex of factors leads to the formation of a special clinical and psychological adaptation. Purpose of the study: to study the prerequisites for the formation of adaptive psycho-vegetative phenotypes in a group of underground workers against the background of clinical and functional changes in the cardiovascular system (CVS). The results of the study of the psycho-vegetative status of 60 underground miners with AH syndrome (age 46.8±2.0 years, experience - 22.0±2.4 years) using the following methods are presented: "Determination of neuropsychic stress by T. Nemchin", "Integrative anxiety test", test with the Schulte-Gorbov table, questionnaire "Severity of symptoms of psychovegetative syndrome". Clinical and functional research methods: ECG, day-long blood pressure monitoring (DLBPM), ultrasound examination (ultrasound) of the heart, general and biochemical blood tests. Conclusions: Correlation analysis of the relationship between the parameters of the psycho-vegetative state with age and experience made it possible to substantiate the adaptive psycho-vegetative phenotypes of underground miners with the risk of developing the AH syndrome in the age aspect. The results can be used for the timely formation of a risk group for the development and progression of the AH syndrome.*

Keywords: *psychovegetative status, dangerous underground work, functional changes, psychovegetative phenotype*

Introduction

The labor activity of underground miners is one of the most physically and psychologically stressful, despite the improvement in working conditions. The intensification of production increases the neuropsychic stress (NPS) of workers. There are special requirements for the psychological state: the ability to long-term concentration of attention, adaptability to monotonous work, emotional stability. Psychological adaptation is influenced by the pace of life and unstable social situation, anxiety to lose the right to preferential retirement. Psychosocial ones join the traditional production factors. The complex impact of physical, chemical, psychological and psychosocial factors creates conditions for the development of psychovegetative dysfunction [4]. A distress reaction of the body is formed, stress-related somatic diseases are found in workers, primarily arterial hypertension syndrome (AH) and hypertonic disease (HD) [1,4]. Long-term exposure to a complex of factors creates the prerequisites for the formation of a stable combination of adaptive psychological changes and fixed vegetative reactions, which constitute an adaptive psychovegetative phenotype and may be accompanied by clinical changes in CVS [3].

Purpose of the study: to study the prerequisites for the formation of adaptive psycho-vegetative phenotypes in a group of underground workers against the background of clinical and functional changes in the cardiovascular system (CVS) in the age aspect.

Materials and methods

60 male underground miners were examined, mean age 46.8±2.0 years, experience in the main profession - 22.0±2.4 years. Patients were diagnosed with AH syndrome at a routine physical examination. The AH criterion was the level of systolic blood pressure (SBP) - 140 mmHg or more, diastolic blood pressure (DBP) - 90 mmHg or more in individuals without taking antihypertensive drugs. The study does not include patients who refused to take part, who have a work experience of less than 5 years, patients with diseases listed in the list of general medical contraindications for admission to work with harmful and (or) dangerous production factors in accordance with orders of the Ministry of Health and Social Development of the Russian Federation N 302n dated 04.12.2011 and N 417n dated 04.27.2012. To achieve this goal, the surveyed contingent was divided into 2 groups depending on age. The first (I) group included patients under 45 years old (n=20), age - 38.6±2.9 years, length of service - 12.7±3.0 years. In the second (II) group - 40 underground miners over 45 years old (age 50.90±1.46 years), experience - 26.7±1.9 years. The comparison groups consisted of men, workers of land occupations without harmful factors: 23 workers, average age - 38.0±2.8 years, length of service - 9.3±1.5 years (comparison group <45); and 26 workers, mean age - 49.2±2.1 years, length of service - 24.0±1.8 years (comparison group >45).

The groups are comparable in terms of sex, age, social conditions. Socio-de-

mographic information and anamnesis of patients were studied. The technique of clinical conversation was used to highlight the personal characteristics of patients. An assessment of psychovegetative dysfunction was carried out using a battery of psychophysiological tests (computer complex "NS-Psychotest"). The following tests were used: "Determination of neuropsychic tension by T. Nemchin", 2011 (assessment of mental tension in points); "Integrative anxiety test" (score in points). Arbitrary attention was studied using a test with the Schulte-Gorbov table. Assessment of the subjective reflection of psycho-vegetative dysfunction was carried out according to the questionnaire "Severity of symptoms of psycho-vegetative syndrome", the result in points. Carried out: ECG, DLBPM, ultrasound of the heart. The results of general and biochemical blood tests were evaluated. The scope of the examination was determined in accordance with the National Standard of the Russian Federation GOST - R 52379-2005 "Good Clinical Practice" and protocols.

Statistical processing was carried out on a PC using the built-in spreadsheet analysis package Excel®2016 MSO (© Microsoft, 2016), author's (© V.S. Sheludko, 2001-2016) package of applied spreadsheets (PASS) "Stat2015".

Results and discussion

The main group of surveyed is represented by underground miners (miner, sinker, drilling rig operator, scraper winch operator, blast hole driller). Their work is accompanied by numerous factors of production (industrial noise, vibration, unfavorable microclimate, increased radioactive background and electromagnetic radiation, excessive muscle load, forced body position, increased dust content in the air at the workplace, mental stress, etc.), characterized as "harmful", 3.3-3.4 degrees. During the clinical interview, no pathocharacterological disorders were found in patients. Personal characteristics differed: thoroughness, reliance on external circumstances and moral and ethical convictions when making decisions, focus on well-being.

Table 1.

The results of the study of the psycho-vegetative state, functional changes in the cardiovascular system and biochemical blood tests

Indicators	Group I (n=20)	Comparison group <45 (n=23)	Group II (n=40)	Comparison group >45 (n=26)
Psycho-vegetative state parameters				
Test with Schulte-Gorbov table, sec.	67.2±6.7*	36.4 ± 2.6	70.9±8.4**	43.5 ± 3.4
Neuropsychic stress, points	40.2±1.5*	40.0 ± 1.8	44.0±2.0**	41.0 ± 1.4
Complaints of a psychovegetative nature, points	1.1±0.4*	0.6 ± 0.2	1.7±0.3**	0.9 ± 0.4
Personal anxiety, points	4.85 ± 0.61	4.2 ± 0.7	5.1±0.5**	4.4 ± 0.9

Functional changes in CVS, general and biochemical blood tests				
SBP, mmHg	128.5±3.6*	126.9 ± 2.9	132.6±2.5**	128.4 ± 2.90
Thickness of the interventricular septum (TIVS), cm	0.9±0.1*	0.8 ± 0.1	1.0±0.1**	0.8 ± 0.1
Atherogenic index,	2.04 ± 0.32	1.83 ± 0.16	2.2±0.2**	1.9 ± 0.12
Total cholesterol, mmol/l	5.03±0.41*	4.73 ± 0.29	5.77±0.5**	4.92 ± 0.17
C-reactive protein, mg/l	5.05±1.17*	4.09 ± 0.98	7.23 ± 1.14**	4.2 ± 1.01

Note: **- p<0,05 – statistically significant differences with the comparison group, **- p<0,05 – statistically significant differences with the indicators of group I and comparison group*

In group I, it was noted: a decrease in the function of attention, a higher level of neuropsychic stress (NPS) with sympathicotonia, an increased number of complaints of a psycho-vegetative nature. Significant changes in the levels of personal and situational anxiety have not been identified.

From the functional indicators of CVS: revealed a trend towards an increase in SBP, an increase in the thickness of the interventricular septum (TIVS). There is a tendency to increase total cholesterol (TC), elevated C-reactive protein.

When analyzing the correlation in group I, it was found: a moderate correlation between age and attention dysfunction, a pronounced correlation between the length of service and the NPS level, a pronounced correlation between the NPS level and the number of psychovegetative complaints (an application for an invention has been filed). The correlation between the parameters of the psycho-vegetative state and functional changes in CVS has not been established.

Thus, underground miners younger than 45 years old have a special adaptive clinical-psycho-vegetative phenotype, which is identified as a "psychologically realized adaptive phenotype" based on a decrease in the function of attention, an increase in NPS, an increase in the number of complaints of a psycho-vegetative nature when these indicators are correlated with age and experience.

In group II, there was a decrease in the function of attention, an increase in the level of NPS with sympathicotonia, an increase in complaints of a psychovegetative nature, and a significantly higher level of personal anxiety.

In group II, it was found: an increase in SBP, an increase in TIVS, an increase in the atherogenic index (AI), TC. In addition, the concentration of creatinine, the concentration of potassium and sodium in the blood serum are higher.

In group II, when analyzing the correlation, it was found: a moderate negative relationship between age and the NPS index, age and personal anxiety, a moderate negative correlation between experience and a decrease in attention function, experience and NPS index, experience and personal anxiety. In addition, the atherogenic index has a moderate correlation with TIVS (pending application). Thus,

in workers over 45 years of age, the relationship between indicators of the psychovegetative state changes qualitatively with age and length of service against the background of more pronounced functional changes in CVS and laboratory blood parameters. This allows us to single out a special "psychosomatically realized adaptive phenotype".

Conclusion

Workers under 45 years of age, within the framework of a psychologically realized adaptive phenotype, react to working conditions mainly by a psychological mechanism (increased NPS, sympathicotonia, decreased attention function). In connection with the cumulation of psychological experiences, there is a qualitative change in the type of response with an increase in experience. The correlation between experience, age and psychovegetative parameters is inverted. Continuing work under the same conditions (increase in length of service) does not lead to an increase in psychological changes, but to early manifestations of CVS dysfunction, somatization of psychological experiences.

The transition of one clinical-psychovegetative phenotype to another increases the risk of transformation of functional changes in the cardiovascular system into pathological changes, and the risk of developing AH increases.

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DOI 10.34660/INF.2022.78.61.024

INFLUENCE OF BLOODLESS TECHNOLOGIES ON THE CURRENT OF THE POSTOPERATIVE PERIOD

Teuvov Aslan Alekseevich
Candidate of Medical Sciences, Associate Professor
Baziev Arthur Mukharbievich
Candidate of Medical Sciences, Associate Professor
Teuvova Alina Aslanovna
student
Teuvov Islam Aslanovich
student
Kabardino-Balkarian State University named after H.M. Berbekov

Abstract. *Blood transfusion in surgery often leads to many complications both during surgery and in the postoperative period. A certain way out of this predicament is a combination of acute normovolemic intraoperative hemodilution with reinfusion of ozonized autologous blood with subsequent postoperative therapy. Were analyzed the results of a study of 158 patients with surgical diseases of the abdominal cavity, divided into 2 groups.*

Keywords: *autohemotransfusion, hemodilution, ozone therapy.*

Introduction

The results of surgical treatment of severe surgical diseases of the abdominal organs, arterial vascular system are still unsatisfactory. Thus, resection of the esophagus, stomach, intestines with tumor lesions in 0.28 - 29.6% of cases is complicated by the failure of the sutures of the anastomosis, and mortality during operations on the pancreas, liver ranges from 9 to 30%. It can be assumed that the development of these formidable, sometimes fatal complications, suppuration of surgical wounds is associated not only with the underlying disease, but also with intraoperative blood loss. Replacement of each lost drop of blood with donor blood is not justified because of the pronounced immunosuppression of blood transfusion, as well as because of the terrible consequences of donor blood transfusion. Therefore, the development of methods for saving blood during surgery, reinfusion of modified autologous blood in the postoperative period, which can improve the results of surgical treatment of a very large group of the population,

is an urgent problem in modern surgery. However, the reinfusion of the patient's blood poured into the wound or through the drains with the Cell Saver apparatus is not very accessible due to the high cost of the apparatus, and the preparation and storage of autologous blood by autohemotransfusion according to the "jumping frog" principle unreasonably delays the preoperative preparation period for a long time, i.e. not economically justified.

Certain prospects are opened by blood exfusion before surgery with controlled normovolemic hemodilution.

At the same time, it should be noted that the amount of exfused blood is significantly limited and does not completely solve the problem. Therefore, improving the therapeutic effect of autoblood collected in containers by treating it with ozone before reinfusion can improve the results of surgical treatment of patients, since ozone has powerful antibacterial, detoxifying, immunomodulatory, antihypoxic, and vasodilating effects.

Hemotransfusion, being a technically simple operation accessible to any doctor, has become very widespread. A definite way out of this predicament is the combination of acute intraoperative normovolemic hemodilution with reinfusion of ozonized autologous blood followed by postoperative ozone therapy.

Purpose of the study: to study the effect of acute normovolemic hemodilution (ANH) with reinfusion of ozonized autologous blood (ROAC) and postoperative ozone therapy (POOT) on the course of the immediate postoperative period.

Materials and methods

The results of a study of 158 patients with surgical diseases of the abdominal organs, divided into 2 groups, were analyzed. The first main group consisted of 82 patients who underwent intraoperative normovolemic hemodilution with simultaneous exfusion of 500-750 ml of blood, its ozonation and reverse transfusion by the end of the operation. In the immediate postoperative period, ozone therapy was performed by daily intravenous administration of 200.0 ml of ozonized isotonic sodium chloride solution. The second control group included 76 patients comparable with the main group in terms of the nature of the disease, the volume of operations performed, sex, age and other indicators and who received traditional treatment and transfusion of donor blood in the postoperative period.

Results and discussion

A comparative analysis of the data of both groups in our studies showed that the frequency of suppurative and inflammatory complications in the control group was statistically significantly higher than in the main group, despite the use of 2 or more antibiotics of different groups in the postoperative period for 7-10 days (average 54 ,3±0.5 injections to one patient). In the main group, as a result of the use of bloodless technologies and ozone therapy, 1 antibiotic was used for 3-5 days (8.3±0.4 injections on average) ($p<0.001$).

Of the 76 operated patients in the control group in the immediate postoperative

period, various complications developed in 20 (26.2%) patients. Of the complications of the immediate postoperative period in patients in the control group, hypostatic pneumonia was observed in 6.6% and pulmonary embolism at different levels in 3.9%. Mortality was 5.2%.

In the main group, only 1 (1.2%) patient developed thrombophlebitis of the saphenous veins of the right leg, there were no lethal outcomes.

Nosological and quantitative characteristics of postoperative complications and mortality in the control group of patients are shown in Table 1.

Table 1.

Characteristics of complications and mortality in the control group of patients

Complications	Number of patients		Died	
	Abs.	%	Abs.	%
Failure of seams of duodenum	2	2,6	2	2,6
Acute adhesive obstruction	1	1,3		
Pulmonary embolism at different levels	3	3,9	1	1,3
Acute renal failure	1	1,3	1	1,3
Hypostatic pneumonia	5	6,6	5	6,6
Suppuration of a postoperative wound	6	7,9	6	7,9
Thrombophlebitis of subcutaneous veins of the lower extremities	2	2,6	2	2,6
TOTAL	20	26,2	20	26,2

As Table 1 shows, of suppurative complications in 6 patients of the control group, with concomitant exogenous constitutional obesity of III-IV degree, despite antibiotic therapy with two antibiotics in combination with the use of metrogil infusions of 200.0 ml/day, suppuration of the postoperative wound occurred.

6 patients suffered from thromboembolic complications: 1 patient had pulmonary embolism, 3 had thromboembolism of small branches of the pulmonary artery with infarct pneumonia (hospital stay increased by 12.4 bed-days), and 2 patients had thrombophlebitis of the saphenous veins of the right lower limb for against the background of varicose disease of the lower extremities (stay in the hospital increased by 7 bed-days).

Characterizing the structure of mortality, it should be said that acute renal failure, which led to the death of 1 patient, developed on the 4th day after the removal of the retroperitoneal tumor, which invaded the rectum, ascending colon and right kidney; 2 patients died from duodenal suture failure (one after resection of 2/3 of the stomach, the second after pyloroduodenoplasty), repeated surgical interventions to eliminate the consequences of this complication did not lead to success in

both patients; 1 patient died from pulmonary embolism on the 7th day after right-sided hemicolectomy for stage III cancer of the ascending colon.

In the above 4 patients, hemodilution with reinfusion of ozonated autologous blood was not performed due to initial arterial hypotension and anemia.

In the main group, the bactericidal and immunomodulatory effects of ozone made it possible to use antibiotic therapy in the postoperative period to a lesser extent than in the control group.

The frequency of suppurative and inflammatory complications in the control group was statistically significantly higher than in the main group, despite the use of 2 or more antibiotics of different groups in the postoperative period for 7-10 days (an average of 57.3±0.7 injections per patient), whereas in the main one, 1 antibiotic was used for 3-5 days (average 8.1±0.3 injections).

The analgesic effect of ozone in the main group was expressed in the use of a smaller amount of certain analgesics. Thus, in the control group in the postoperative period, narcotic analgesics were used up to 3 injections per day for 2-3 days (average 6.5±0.3 injections per patient) and then non-narcotic analgesics for 4-6 days (average 14.2±0.2 injections). In the main group, in the postoperative period, narcotic analgesics were used after each operation twice on the first day (average 2.0±0.3 injections per patient) and then non-narcotic analgesics for 2-4 days (average 7.8±0. 2 injections).

Conclusions

Thus, our studies have shown that the use of elements of bloodless surgery with ozone therapy in the postoperative period in patients of the main group contributed to a decrease in the total number of antibiotics used, a decrease in the number of complications and mortality.

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DOI 10.34660/INF.2022.65.85.025

THE MOST IMPORTANT THINGS IN HEALTHCARE ORGANIZATION IN RUSSIAN FEDERATION

Nemstsveridze Iakov Elgudzhovich
Moscow medical university «Reaviz», Moscow

Abstract. *The article discusses the most important aspects of modern health care. Positive aspects and issues requiring additional solutions are highlighted.*

Keywords: *healthcare organization,medicine,dentistry.*

Introduction

The Russian healthcare system has undergone many changes since the collapse of the Soviet Union. The transition from the Soviet health care system to the Russian one required a number of economic and legal reforms. At the moment, there are a number of positive aspects in the Russian healthcare system. There are also issues that require additional consideration in order to further resolve them.

Purpose of the study - Consider the most important aspects in the modern health care system in dentistry and in general. Highlight the main problems requiring additional consideration in order to further resolve them.

Materials and methods

Analyzed domestic literature in this area.

Results and discussion

Analyzing modern legislation in the field of health care, it can be noted that one of the most important rights of Russian citizens is the right to health care and medical care[1]. The lack of medical personnel is one of the system's biggest problems. Provision of the healthcare system with qualified medical personnel is an important condition for accessibility and quality of medical care to the population. medical staff refers to expensive resources, requiring a lot of preparation qualified specialists. But Unlike most resources that decline in value over time, the value of the health workforce with accumulation of professionalism and experience increases[2,3,4,5]. The most acute problem of shortage of medical personnel is observed in the regions of the Russian Federation.

This problem is connected primarily with the fact that the majority of specialists go to get education in large cities and having received it there, they remain

there to work. However, specialists educated in their hometown often also prefer to go to work in the capital and larger cities, thereby creating a personnel crisis in their native regions.

The problem of personnel shortage has affected all specialties of medicine. Including dentistry. In dentistry, there are a number of narrow-profile specializations, which means that patients often have to travel to larger cities for implantation. As a solution to this problem, it is advisable to open additional branches of medical universities in small towns. This will partly solve the problem, since a number of specialists, having the opportunity to get a specialty in their city, will remain to practice there.

An equally important problem is the insufficient level of education of the population of small towns on measures to prevent the occurrence of diseases. This problem is also related to the lack of medical personnel who would be engaged in educating the population. There is a significant shortage of dental hygienists in dentistry. In part, the solution of this problem would be facilitated by the introduction of remote technologies in the field of healthcare.

Also, online webinars began to be held regularly, which talk about preventive measures for various diseases. Such webinars are held both for doctors, which allows them to teach them how talk to patients and educate the population in their cities, and for patients, explaining the basic principles of proper oral hygiene and a number of other preventive measures in order to prevent the occurrence of any diseases.

A way to solve a number of problems is to transfer doctors to a contract that is beneficial for them with incentive payments for work in hard-to-reach cities. This is especially true for narrow-profile specialists. At the moment, the Ministry of Health has implemented a number of projects with incentive payments to doctors in hard-to-reach cities. This program helped to significantly solve the personnel crisis, but, unfortunately, not completely, since the need for medical personnel outside of large cities is huge.

An equally effective measure of a partial solution of the personnel issue is the provision of temporary housing for doctors at the time of work in the region under a contract.

For example, according to the Ministry of Health, provision of the population with doctors Perm Krai is in fifth place in the Volga. The low staffing of health care facilities with medical workers is largely due to the lack of housing[6,7].

This program was also introduced and is currently operating in a number of regions. However, the full provision of absolutely all employees with housing is complicated by a number of economic factors.

The current regulatory framework is aimed more at satisfying the rights of the patient than the doctor. Federal Law No. 323 does not solve all issues of social and

legal protection of medical workers, with the exception of some reservations, for example, in Article 70: doctor" [8,9].

Conclusion

To date, there are a number of unresolved issues in the healthcare system of the Russian Federation, however, new programs and laws are regularly applied and successfully implemented to solve existing problems.

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DOI 10.34660/INF.2022.95.80.026

DIGITAL BLOOD ANALYSIS TECHNOLOGIES

Tikhonenko Zlata Olegovna
CEO
Accofrisk Technology Ltd.
Kalachev Aleksandr Viktorovich
Candidate of Physico-mathematical Sciences, Associate Professor
Altai State University
Tikhonenko Daniil Olegovich
Engineer
Accofrisk Technology Ltd.

Annotation. *The article is devoted to the formulation of a new approach to blood analysis related to differential methods for measuring the number of blood cells and the speed of blood movement based on the use of optical methods and the use of fitness wristband devices that use photoplethysmography to solve these problems.*

Keywords: *blood, blood cells, photoplethysmography, matrix determinant, blood velocity, glucose level, blood composition, linear relations, optics, LED, monochrome radiation, coherence.*

Introduction

Currently, the penetration of digital technologies in medicine is primarily associated with the "digitization" of data and the accumulation of big data. On the one hand, this is an understandable trend of medical digitalization, and on the other hand, it is only qualitative changes that are not yet associated with a new approach to the diagnosis of various conditions.

Blood tests, primarily glucose blood tests are a very effective tool for the diagnostician and therapist [1]. The disadvantage of the modern approach to the analysis is their comparative rarity. Even in a hospital, a blood test is taken once, rarely twice a day. Patients with diabetes also do an independent analysis once or twice a day. This is due to the invasiveness of the analysis when it is necessary to make skin punctures for the blood collection.

Therefore, there is an issue of more frequent blood analysis for such an indicator as glucose, and on the other hand, the transition to non-invasive methods of analysis.

Problem statement and its consideration

The solution to the problem is to use optical sensing of vessels using coherent light sources, coupled with the highly accurate reception of a reflected light signal.

The fact is that blood cells reflect and absorb light radiation to varying degrees. In addition, the blood flow rate changes in various clinical conditions (pregnancy, diabetes, etc.). For instance, when the level of glucose increases, the speed of blood movement increases [2,3].

This effect is partly used in wrist bracelets-heart rate monitors. In this device, there is a period of low reflection (the vessel is filled with blood, systolic pressure) and strong absorption, and vice versa when the vessel is low in fullness (diastolic pressure).

However, both the speed and composition of blood cells in the field of optical sensing can be objectively evaluated only if the probing pulses are sent frequently enough.

Let's assume that we have identified three types of blood cells that absorb light radiation in different ways (to a strong extent) – we will call them "type i cells".

If n_{1t}, n_{2t}, n_{3t} are numbers of blood cells of type 1, 2, 3 at time t, then with the intensity of r_1, r_2, r_3 captured in the optical receiver, we can form a system of linear relations:

$$an_{1t1}+bn_{2t1}+cn_{3t1}=r_1$$
$$an_{1t2}+bn_{2t2}+cn_{3t2}=r_2$$
$$an_{1t3}+bn_{2t3}+cn_{3t3}=r_3$$

where *a*, *b*, and *c* are constant light absorption coefficients for cells of type 1, 2 and 3.

Thus, we have an analogue of a system of linear equations in which the solution (a, b, c) is known, but the coefficients for "variables" are unknown. The only solution is if the determinant of the matrix is not 0.

$$\begin{bmatrix} n_1t_1 & n_2t_1 & n_3t_1 \\ n_1t_2 & n_2t_2 & n_3t_2 \\ n_1t_3 & n_2t_3 & n_3t_3 \end{bmatrix}$$

Fixing the values for time samples (t_1, t_2, t_3) produced quite often, for example, 50-100 times per second, allows you to accurately measure the speed of cell movement in blood vessels. Besides, determining the number of different cells in the field of observation will allow you to draw conclusions about haemoglobin and its changes, the amount of glycated haemoglobin, and other indicators.

State of the problem

There is a CNOGA solution available (Combo Glucometer, Israel [4]). https://cnogacare.co/

Figure 1. *Device image CNOGA*

The Israeli company CnogaCare positions itself as a digital medical company with solutions for remote monitoring of patients. It created a hybrid device – "invasive/non-invasive". The device requires invasive calibration within 3 days and can be configured individually for a person. Its measurement time is about 40 seconds. A trained neural network is used to assess glucose levels.

Technical solution

The blood composition analyzer and glucose meter **Accofrisk™** is a revolutionary mathematical and medical development that helps determine both blood sugar levels and other blood composition indicators. The device is non-invasive (does not require skin punctures) and belongs to the category of high-accurate equipment.

With this device, a person can independently monitor the blood composition and, first of all, the glucose level and monitor deviations. This is an ideal solution for both diabetics and people with a predisposition to this disease. The device can also be used as a preventative solution for health monitoring or dietary adjustments. Early detection of diabetes increases the likelihood of treatment by 95%.

This new solution in the field of medicine allows you to avoid piercing the epidermis several times a day.

This non-invasive equipment has no analogues or cheaper analogues, and the technology of establishing relative parameters of blood flow velocity based on the reference time for which the blood sugar content is known has not been massively mastered to date. An increase in speed and a lighter blood colour indicates an increase in sugar content.

Figure 2. *Fitness bracelet Samsung*

The technical basis is a wrist bracelet for measuring the heart rate (HR – heart rate). The device is equipped with a led that emits monochrome coherent light radiation in a narrow frequency range. Pulse measurement is based on the photodiode receiving radiation reflected from subcutaneous capillaries, which changes synchronously with the pulse. The more blood there is in the capillary, the more light is being absorbed (when it is full, it absorbs light strongly; when it is not full, it absorbs light weakly).

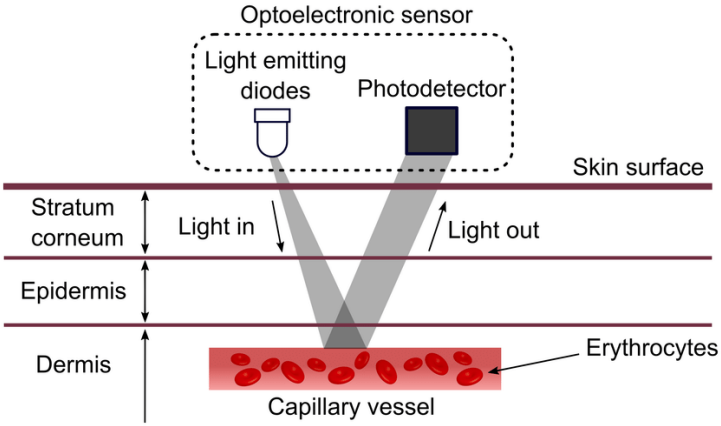

Figure 3. *The scheme of the photoplethysmogram*

The principle of heart rate measurement used in "smart" wrist bracelets differs from that used in conventional medical devices with mechanical or electrical action. This is due to the sensors built into the inner side of the bracelet. For their work, the method of **photoplethysmography** is used [5,6], which allows you to determine changes in blood volume using optical radiation. When contracting, the heart muscle provokes an increase in blood pressure. Capillary blood flow increases, resulting in more light being absorbed. The sensor registers this, and by counting the number of such bursts per minute, the device determines the heart rate.

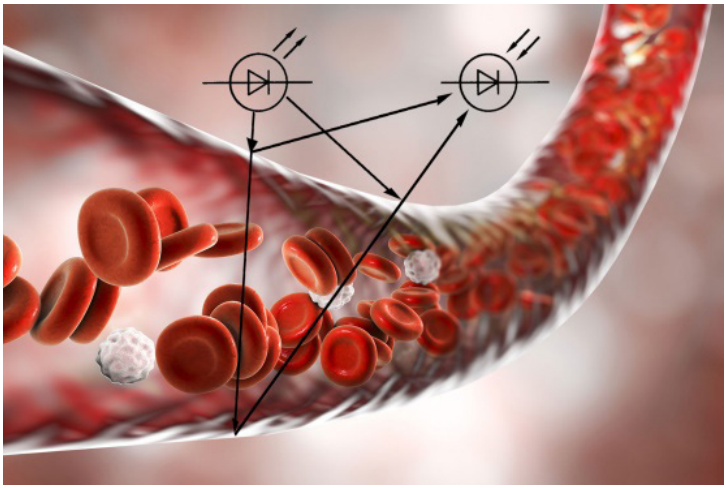

Figure 4. *Blood cells*

The photoplethysmogram is a method for recording blood flow using an infrared or light source and a photoresistor or phototransistor. The greater the blood flow, the more light is absorbed by red blood cells in the body's tissues, so less light comes to the photoresistor.

The rate of blood flow in the capillaries is slow and is about 0.5-1 mm/s. Thus, each blood particle is located in the capillary for about 1 s. the Small thickness of the blood layer (7-8 microns) and its close contact with the cells of organs and tissues, as well as the continuous change of blood in the capillaries, make it possible to exchange substances between blood and tissue (intercellular) fluid.

The photoplethysmogram allows you to measure the volume pulse of blood caused by periodic changes in blood volume with each heartbeat, heart rate, and heart rate variability.

The photoplethysmogram, using a fine spectrum analysis, will also allow you to find out the percentage of glycated haemoglobin since glycated erythrocyte cells absorb light differently than normal ones.

The approximate algorithm is as follows

1. More than 50 light pulses are generated on the led of the wrist bracelet per second (for example, analogues of Delta functions, sawtooth and reverse sawtooth signals, and the response from blood vessels is received with high accuracy on a single time scale) - photo location is performed.

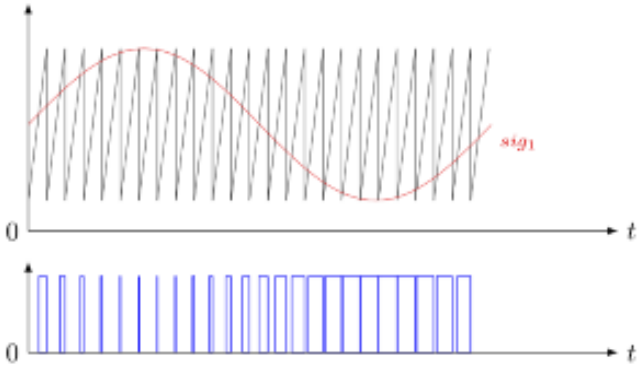

Figure 5. *Delta functions, sawtooth and reverse sawtooth signals*

2. The received signal is subjected to rapid processing by means of the bracelet and hazardous events are highlighted, for example, changes in blood density, its density (at the minimum and maximum of the absorbed signal), or " colour " (changes in the absorption band relative to the main frequency of the photodiode radiation).

3. The received signal is transported to your smartphone, where the Fourier transform is performed with identifying and comparing the emitted spectrum and received signals (a few tens of harmonics) with each other.

4. The "capillary model" is being created and its changes are being monitored. The capillary model is an operator for changing the spectrum of a light signal when light passes through a vessel. In practice, we consider the capillary as a dynamic optical filter and associate its parameters with the parameters of blood flowing through it (see the «Consideration» in this article).

5. The device is calibrated using external parameters (a certain set of parameters corresponds to a certain sugar level, haemoglobin level, etc.).

6. The display of sugar and haemoglobin parameters after calibration on the bracelet occurs in continuous mode.

7. Next, the level of glycated haemoglobin is calculated and displayed.

Conclusions

Compared to other methods of non-invasive assessment of blood composition and glucose levels [7,8], this method allows you to quickly assess the patient's condition and perform diagnostics and monitor blood glucose levels, as well as make recommendations for eliminating identified issues in real-time. At the same time, a fully operational, reasonable and documented conclusion is made about the patient's condition, which may be important for insurance medicine. The method of speed measurement using linear ratios and spectrum analysis reduces external

interference and measurement errors and does not require additional complex devices for assessing blood composition and glucose levels. There is no need as well to pierce the patient's skin or attach sensors to the body, which is convenient for the patient. It also informs you of any increases or decreases in glucose levels and allows you to evaluate glucose levels and other parameters several times per hour.

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DOI 10.34660/INF.2022.47.90.027

WEB APPLICATIONS IN THE CLASSROOM MANAGEMENT USING CLIL TECHNOLOGY

Korazbekova Karlygash
PhD, Associate Professor
Ashym Zhibek
Shondybai Aiman
Tagabayeva Arailym
Dosbol Mansura
Altynsarin Arkalyk Pedagogical Institute (Altynsarin Institute, Kazakhstan)

Abstract. *Content and Language Integrated Learning technology is growing in the process of integration of educational and scientific organizations into the world community. Because, it is an approach for the development of social, cultural, cognitive, linguistic, academic and other reading skills, which in turn contributes to the achievement of both the subject and the language. CLIL teachers need to provide more new and interesting strategies to support and improve students' achievements. Therefore, the effectiveness of the using CLIL-technology in lessons with web applications from the point of view of student-teacher during teaching practice was studied among 27 students of Altynsarin Arkalyk Pedagogical Institute. Our research results show that more about 70% of students know about CLIL technology and half of students practiced CLIL-lessons during teaching practice. Furthermore, CLIL technology is popular among future teachers; most of them have combined CLIL lessons with digital applications (55.6%). And, according to the survey results, Quizizz, Kahoot, LearningApps were the most speeded teaching tools. The ways for improving CLIL technology in Kazakhstan are training of specialists, recommendation and implementation in all schools, using new methods and etc.*

Keywords: *CLIL technology, web application, CLIL-lessons*

Introduction

Today, the English language is of great importance in the system of intercultural communication of different peoples of the world. It is directly involved in the formation and development of cultural, educational, political and socio-economic ties in the international arena. Recently, the role of English in the process of in-

tegration of educational and scientific organizations into the world community is growing significantly [1]. In this regard, there is a need to use modern forms and methods of teaching a foreign language, which will ensure the most effective implementation of the training programs [2].

The term Content and Language Integrated Learning (CLIL) was coined in 1994 by David Marsh, a researcher in multilingual education, in the process of coordinating research on the state of language education in Europe [3]. This led to a pan-European debate with representatives from Finland and the Netherlands. There was a discussion on how to use the best practices of foreign language teaching found in the curricula of certain types of private schools, public schools and colleges.

Spfie Ioannou Georgiou and Pavlos Pavlu conclude that among the features of the CLIL methodology can be distinguished three main things [4]:

a) learning a foreign language integrated into the content of the discipline, such as science, history, geography, biology. Students study a foreign language through the simplified content of the discipline.

b) CLIL comes from different socio-linguistic and political contexts and applies to any language, age and level of education: preschool, primary, higher, vocational education. In this context, CLIL is responsible for all European educational programs for all citizens, where multilingualism and multiculturalism are believed to promote integration, understanding and mobility among Europeans.

c) CLIL is an approach for the development of social, cultural, cognitive, linguistic, academic and other reading skills, which in turn contributes to the achievement of both the subject and the language [5].

Let's take a closer look at the language of biology right now. Kelly and Keith identified three levels of language in their CLIL in Natural Science Subjects: language and task to discuss science classess. The first language is the subject-specific language of science. It is a language that science teachers describe as unsuitable for science. For example, in the context of the subject of biology "cells and tissues", biology teachers can be justified by the opinion that it is impossible to study the topic without knowing the term "epithelium". These specific terms are usually subject-specific nouns that make up the basic concept of science. The second level of language in science is the common academic language. This general academic language is sometimes described as an interdisciplinary language, which is found not only in one area of the curriculum, but also in many subjects. An example of this is the language of "cause and effect". It can be assumed that this language is used not only in science, but in a number of disciplines throughout the curriculum.

The third and final level of language in the classroom is the peripheral language of the class. This language is the language of teacher management, in the classroom it is a "chat" between students and teachers, it is the language of instruction and the subject of random language around.

According to Deller and Price, the methodology of teaching a subject in a foreign language is different from the methodology of teaching a foreign language. . This is because students need constant support, and secondly, they have to overcome cowardice and fear because they are studying the subject in a second language, a language they do not know. In the lower grades, teachers need to pay more attention to sensitivity than to productive, productive skills. The writing component of this level can be simply copying and pasting objects, writing one-syllable answers to questions [6].

Deller and Price also say that CLIL teachers need to provide more strategies to support and improve students' comprehension and reading skills, which means teaching with the most new and interesting strategies. Teachers should use many visual elements, such as pictures, charts, or tables. There should be a lot of repetition and concentration on the language, and ways should be taken to remember the terminology and information. When it comes to writing, the exercises should be done twice, because the second time students will be able to pay more attention to the language [6].

Purpose of the study – to establish the effectiveness of the using CLIL-technology in lessons with web applications from the point of view of student-teacher during teaching practice.

Materials and methods

The study object was 4th year students of I.Altynsarin Arkalyk Pedagogical Institute (Arkalyk, Kazakhstan). A total of 27 students took part in the survey. The questionnaire consists of 10 questions:

1. Do you know about CLIL technology?
2. Have you ever used CLIL technology in your lessons during teaching practice?
3. Do you think it is better to combine subject and language?
4. Why do you think it is better to integrate subject and language teaching?
5. Why do you think it is wrong to integrate subject and language teaching?
6. Have you ever used web applications while learning with CLIL technology?
7. What web applications did you use?
8. CLIL technology has been used abroad since school. This experience is being introduced in our country as well. Your opinion about this ....
9. 1 difficulty and 1 advantage of integrated subject and language teaching
10. What are your suggestions for improving CLIL technology?

Results and discussion

The first two questions provided information about the name and majoring of respondents. Among the students who took part in the survey were 11 students majoring in History, 1 student majoring in Chemistry, 12 students majoring in Biology, 2 students majoring in Geography. Below are given results of survey analysis separately for each question:

1. To the question “Do you know about CLIL technology?”, according to Figure 1, 74.1% (20 students) of students answered yes and 25.9% (7 students) of students answered no.

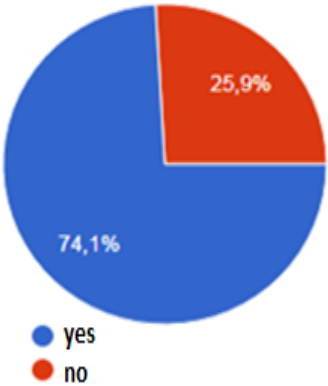


Figure 1. *Results of the survey: 1 question*

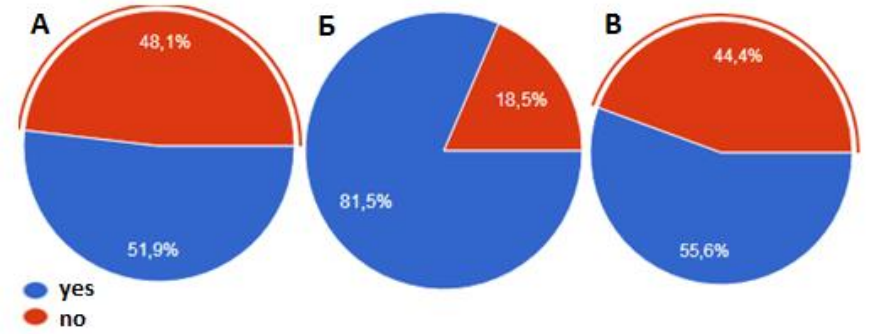
2. Have you ever used CLIL technology in your lessons during teaching practice? According to Figure 2A, 48.1% (14 students) answered no and 51.9% (13 students) answered yes.

3. Do you think it is better to integrate the subject and language? According to Figure 2B, 81.5% (22 students) of students answered yes and 18.5% (5 student) disagreed.

4. There are different critical answers to the question: why do you think it is better to integrate subject and language teaching? Many respond, "It contributes to students' thinking and independent work, innovates and learns through integrated subject and language learning, because it increases students' cognitive activity and motivation, because it is interesting and motivating to perform and corresponds to students' language level."

5. In the following texts, students answered the question: why do you think it is wrong to integrate subject and language teaching? Texts such as "Each subject has its own requirements, it is not a lesson in learning another language", "It can be difficult for low-achieving students".

6. Have you ever used web applications while learning with CLIL technology? 44.4% said no and 55.6% answered yes. According to Figure 2B, 15 students actively used web applications during the lesson, while 12 students did not use them in teaching practice.



А - use of CLIL technology; Б - Integrated teaching of subject and language;
В - Use of web applications

Figure 2. *Results of the survey on CLIL technology*

7. What web applications did you use? In this regard, 13 students used ***Quizizz***, 11 students used ***Kahoot***, 5 students know how to work with ***LearningApps.org***, 3 students are familiar with ***Wordwall***, 1 student tried to work with ***Wooclap***, 1 student planned a lesson using ***Google Classroom***, 1 student replied that he had not tried them.

8. CLIL technology has been used abroad since school. This experience is being introduced in our country as well. Your opinion about this ....

Comments of respondents: Some students said they did not support it, while others said, "I fully support it if it has a positive impact on the education of future generations." "I prefer to use CLIL technology from school, because it affects the student's ability to quickly master not only the subject, but also another language", "I think that innovation is always needed. Because the better the development of the education system, the better it can help to raise the level of students "," This is a language tool that allows students to learn their native language and a foreign language at the same time. I am confident that this experience will have a positive effect in our country. "

9. 1 difficulty and 1 advantage of integrated subject and language teaching. As a challenge, the students suggested that the method be updated daily, that it take a lot of time, that there is a risk of misunderstanding the subject, that students and teachers need to be trained, and that there is a lack of orientation. He noted that the advantage of learning a foreign language is the comprehensive development of the child.

10. Your suggestions for improving CLIL technology -

- It would be easier for both the child and the teacher to include integrated teaching in all subjects, not only in science;
- Training of specialists;

• Recommended and implemented in all schools;

• In order to become a qualified and educated professional, every teacher must constantly improve their knowledge and constantly improve their professional skills in accordance with modern requirements. The more creatively a teacher masters new teaching methods, the more professional the teacher will be;

• add new methods;

• CLİl technology would be available somewhere in every classroom and auditorium.

Analyzing the questionnaire among students, we come to the following conclusion: There are still few professionals who know CLIL technology and use it in every lesson. In our country, in Kazakhstan, a trilingual education specialist is being trained in natural sciences. At the same time, while many science students supported the technology, most students majoring in the humanities, especially history, did not. It should be noted that this also depends on the specifics of the subject.

Conclusion

In conclusion, CLIL teachers need to provide more strategies to support and improve students' comprehension and reading skills, which means teaching with the most new and interesting strategies. One of them is using web-applications, like Quizizz, Kahoot, LearningApps, Wordwall and etc. The effectiveness of the using CLIL-technology in lessons with web applications from the point of view of student-teacher during teaching practice was analyzed by online survey. More about 70% of students know about CLIL technology and half of students practiced CLIL-lessons. Furthermore, CLIL technology is popular among future teachers; most of them have combined CLIL lessons with digital applications (55.6%). And, according to the survey results, Quizizz, Kahoot, LearningApps were the most speeded teaching tools. Training of specialists, recommendation and implementation in all schools, using new methods are the ways for improving CLIL technology in Kazakhstan.

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DOI 10.34660/INF.2022.90.82.028

THE ENVIRONMENTAL ASPECT OF THE ESG AGENDA AS A MECHANISM FOR SUSTAINABLE DEVELOPMENT

Tsypkin Yuri Anatolyevich
Doctor of Economic Sciences, Full Professor, Head of Department
Fomina Anastasia Vladimirovna
Postgraduate
Chuksin Ilya Vitalievich
Undergraduate
State University of Land Use Planning

Abstract. *Domestic companies Sberbank, Lukoil, Gazprom, etc. take a vector towards ESG (environmental, social, governance) development. The new direction in the environmental aspect is characterized by concern for the world around, minimizing the negative consequences on natural objects and resources. In this regard, it is necessary to determine more effectively the levers for implementing the provisions of the ESG agenda. One of the effective mechanisms is the institution of environmental audit.*

Keywords: *ecology, environmental audit, comfortable urban environment, spatial development.*

Introduction

The issues of improving the quality of the environment and the transition of Russian cities to modern development models began to occupy a paramount place in the aspect of the economic beneficial use of the state's territories. The authorized authorities in the field of general planning, strategic master planning are striving to create and develop the latest tools in the areas of "smart" city, ESG factors, the introduction of Big data technologies, artificial intelligence, PropTech.

Purpose of the study

The use of physically obsolete equipment, insufficient attention to environmental protection measures on the part of individuals has led to major environmental problems such as pollution of water resources, soil, and atmospheric air. In this regard, it is necessary to consider the role and essence of environmental audit in the environmental context of the ESG agenda.

Materials and methods

The issues of the institute of environmental audit were analyzed

Results and discussion

The growing demand for a comfortable urban environment requires the full implementation of the set of tools presented, which should be preceded by a procedure for revising the transition of cities to an integrated development path. It is necessary to carry out the procedure for transforming the processes of urbanization, identifying in a global language - to make the transition from urban management to urban governance in the interconnection of decision-making together with citizens, authorities and business, taking into account, first of all, the investment component. This model of city system management should and should cover economic, environmental and social aspects. Their cumulative nature of interaction today, or rather the last 10 years, is interpreted as "sustainable development of the city." However, the St. Petersburg International Economic Forum 2021 (SPIEF-2021) "Urban Habits" within the framework of the international program The United Nations Human Settlements Program secured the importance in the system of formation of "Sustainable Cities" for the environmental, economic and social component as an aspect of long-term spatial development of territories and a factor of acceptance investment decisions within the framework of ESG factors [10].

It should be noted that the development of the ESG agenda (E (environment) - responsible attitude to the environment, S (social) - high social responsibility, G (governance) - high quality corporate governance) has become one of the dominant trends in the modern global economy (knowledge economy - "Industry 4.0") in connection with the accelerating process of "digitalization" and the emergence of new global problems of our time (COVID-19 pandemic).

The system of urban management, more precisely co-management, in the ESG agenda of modernity as a factor in the spatial integrated development of cities, should include the environmental component as the most significant in terms of sustainable development in the light of the current climate agenda (combating climate change) [3, 5, 6, 7]. Issues that may be relevant here include:

- decarbonization (transition to vehicles with zero emissions);
- increasing energy efficiency (transition to hydrogen energy);
- recycling of waste (transition to environmentally friendly materials);
- improving the efficiency of water resources use;
- improving air quality.

The social aspects of the ESG policy for the purpose of the spatial integrated development of cities can be implemented by ensuring the rights and welfare of workers, that is, the regulation of platform employment (paid leave, minimum wage, pension contributions, overtime pay). In addition, ensuring diversity and inclusiveness, which is closely related to the previous one. Particular attention here is occupied by certain social groups, with the aim of maintaining gender equality, increasing inclusiveness and increasing the proportion of various minorities. Much important in the social aspect is the interaction with local communities and

the implementation of "social investments".

Touching upon the last component of the ESG agenda of our time - the management aspect, we note such components of platform solutions in the field of urban spatial development as:

- improving the quality of corporate governance;
- ethical business conduct on the territory of administrative-territorial units;
- protecting the health and safety of consumers;
- cybersecurity;
- observance of human rights.

As part of this article, we decided to study the environmental component of the ESG agenda. The use of physically obsolete equipment, insufficient attention to environmental protection measures on the part of individuals has led to major environmental problems such as pollution of water resources, soil, and atmospheric air. In this regard, it is necessary to consider the role and essence of environmental audit in modern realities.

Foreign countries began to use environmental audit in the 70s of the 20th century as a management tool in the face of tightening environmental legislation and increasing pressure from stakeholders. Currently, foreign countries have already developed a system of environmental audit with the use of control and supervisory authorities for inspections. There is developed legislation regarding the organizational aspects of conducting inspections, requirements for eco-controllers have been established, and a system of public-private supervision has been created. Thanks to this work, a significant, gradual, qualitative improvement in the environmental activities of European companies and organizations has been achieved.

Most environmental problems and disasters can be eliminated if the institution of environmental audit is used. A timely environmental audit allows for a comprehensive audit of compliance with environmental legislation, which will lead to the prevention of negative consequences and penalties. But at the moment, this mechanism is practically not used due to the lack of regulatory legislation [7].

The legislation contains only the definition of environmental audit. So the Federal Law of January 10, 2002 № 7-FZ "On Environmental Protection" contains a definition of environmental audit and means by this "an independent, comprehensive, documented assessment of compliance by a legal entity or an individual entrepreneur with requirements, including standards and regulations, federal norms and rules, in the field of environmental protection, the requirements of international standards and the preparation of recommendations for improving such activities. And further, the legislation does not regulate this type of activity in any way [3, 4].

The development of environmental audit is an essential component of the development of economic and financial mechanisms, improvement of the ecological environment of human life, natural safety, for the implementation of state policy in the field of ecology. The Environmental Doctrine of the Russian Federation

dated August 31, 2002 № 1225-r, the Concept of Long-Term Socio-Economic Development of the Russian Federation for the period up to 2020 dated November 17, 2008 № 1662-r, says that the use of environmental audit is one of the directions for ensuring environmental safety [1,2].

The environmental audit system is defined as one of the main strategic guidelines of the Energy Strategy of Russia for the period up to 2030 dated November 13, 2009 № 1715-r [6].

At the moment, the role and place of environmental audit in the management system of various business entities are not regulated by law, given that the industrial boom has begun in the Russian Federation, which is not accompanied by a positive impact on the environment. The adopted normative-legal acts only on paper have so far created a system of environmental monitoring, which has not been applied. Thus, the development of the institution of "environmental audit" was developed in the draft federal law "On Environmental Audit, Environmental Auditing". [8, 9]

Thus, this draft law eliminates legal problems and will prevent and reduce the negative consequences of economic activity on the environment. It will also allow creating a qualified market for environmental auditors, and will allow the state to build an enterprise management system.

Conclusion

Thus, environmental audit fully complies with the priority areas of activity of the Government of the Russian Federation and is one of the components of improving public administration in the field of environmental protection. An environmental audit can become the basis of an ESG strategy. Accounting for ESG factors in the system of co-management of urban areas will achieve sustainable socio-economic development of the territory and increase the quality and standard of living of the population, achieve the process of adopting a strategy for the spatial development of the municipality, to a greater extent operating with the qualitative characteristics of the territory and objects, the development of which is provided for by quantitative indicators of social economic development and territorial planning of the municipality.

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DOI 10.34660/INF.2022.91.15.029

CARTHAMUS TINCTORIUS L. CHARACTERISTICS EXPRESSION DEPENDING ON THE TIME OF SOWING IN THE CONDITIONS OF TRANSNISTRIA

Mustiatse Karina Valerevna
Postgraduate
Chavdar Nina Semenovna
Candidate of Agricultural Sciences, Associate Professor
Rushchuk Alexander Dmitrievich
Candidate of Biological Sciences, Associate Professor
Zanfirova Mirabella Andreevna
Undergraduate
Shevchenko Transnistria State University

Abstract. *In connection with the warming and aridization of the climate in Transnistria, studies on establishing the optimal sowing dates for Carthamus tinctorius L. as a drought-resistant, heat-resistant oilseed alternative to sunflower are topical. As a result of the studies carried out in 2020 and 2021 according to the spring sowing dates (03.20; 03.27; 03.03; 04.14; 02.05), it was found that the best time for sowing safflower dye for the conditions of Transnistria was the earliest, March 20. The first sowing date had a positive effect on the growth and development of plants, which affected the formation of the highest yield in the experiment: 4.4 c/ha in the conditions of the most severe drought in 2020 and 33.7 c/ha in 2021, which is favorable in terms of climatic conditions.*

Keywords: *Carthamus tinctorius L., sowing time, plant height, number of shoots of the first order, number of inflorescences, seed weight per plant, yield.*

Introduction

Currently, global warming is observed, accompanied by droughts, which leads to a revision of the list of traditionally cultivated crops.

So, for example, in 2020, the most severe drought was observed in Transnistria, the most severe for the entire period of instrumental observations [1]. It had a negative impact on the agriculture of the republic. According to the State Statistics Service of the Pridnestrovian Moldavian Republic, 45.8% of winter crops sown in the fall of 2019 died before the end of the sowing period for spring crops. In Tira-

spol, 95.3% of winter crops perished. The main oil crop of the region, sunflower, was harvested by 88.7% of the sown area in the whole country, in Tiraspol - by 44.8% (the yield was 2.8 c/ha) [2].

In this regard, the introduction of new, most drought-resistant and heat-resistant crops is of great importance. An oilseed alternative to sunflower is safflower (*Carthamus tinctorius L.*). It is a drought-resistant, heat- and cold-resistant culture, characterized by multi-purpose use: in the food and medical industries, cosmetology, and fodder production [3, 4].

This culture is being selected and the cultivation technology is being developed in certain natural and climatic zones [5 - 7]. The Register of Breeding Achievements of Russia for 2021 includes 15 varieties of safflower [8]. Particular attention is paid to this crop in areas with insufficient moisture, which includes Transnistria. There is no safflower in the Register of Plant Varieties Approved for Use in the Pridnestrovian Moldavian Republic. However, in the Republican Botanical Garden (Tiraspol), selection work is being carried out on this culture. Along with this, agrotechnical studies of the elements of safflower cultivation technology in the conditions of Transnistria are being carried out, in particular, in 2020-2021, the spring sowing dates were studied.

Purpose of the study: set the most optimal sowing date for *Carthamus tinctorius L.* for Transnistria conditions.

The ***objectives of the study*** included: to determine the influence of the timing of sowing crops on the architectonics of the bush, the elements of productivity.

Material and methods

Research on the influence of the timing of sowing safflower on the complex of traits was carried out at the Faculty of Agrarian Technology of Shevchenko Transnistria State University. The years of the research were distinguished by their contrast in weather conditions, especially in the amount of precipitation.

Table 1.

Air temperature and precipitation (Tiraspol agrometeorological station)

Months of the year	Indicators					
	Air temperature, °C			Precipitation, mm		
	Long-term average (1881-1980)	2020	2021	Long-term average (1881-1980)	2020	2021
1	-3.0	0.6	-0.6	27	20.3	45.3
2	-1.6	4.2	-0.4	31	22.0	26.5
3	2.7	8.4	3.7	23	23.1	34.4
4	10.1	10.8	8.3	33	3.5	50.3
5	16.2	14.7	15.2	50	79.3	61.6

6	19.9	22.2	20.2	70	52.6	75.2
7	21.9	24.5	23.9	58	20.8	169.8
8	21.0	24.2	21.6	49	0.9	96.8
9	16.2	20.2	15.3	36	53.4	8.5
10	10.0	15.3	9.3	31	37.0	5.1
11	4.7	5.0	6.1	38	32.6	18.9
12	-0.3	2.5	1.6	40	36.9	69.3
Per year	**9.8**	**12.7**	**10.4**	**486**	**382**	**661.7**

An analysis of the temperature regime during the years of the research indicates an increase in air temperature in 2020 and 2021 compared to the long-term average data, both within a month and a year. A particularly significant excess of air temperature was observed in the summer months, during the critical period of plant growth: the phases of budding and flowering. The excess of the average annual temperature in 2020 was 2.9 °C, in 2021 - 0.6 °C.

In terms of the amount of precipitation, the years of research were very contrasting: 2020 is an acutely dry year, 2021 is a wet year. In 2021, 1.7 times more precipitation fell than in 2020. Compared to the average long-term indicators, in 2020 there was 104 mm less precipitation, in 2021 - 175 mm more (table 1).

The source material for research was a collection sample of safflower dyeing Republican Botanical Garden (Tiraspol).

In 2020 and 2021, experience was laid for spring sowing dates: 20.03; March 27; 03.04; 14.04; 02.05.

The scheme of sowing safflower dye: (90+50)x10 cm, which corresponds to the plant density - 143 thous./ha. The experiment was laid in three repetitions.

Before harvesting safflower in the field, biometric observations were carried out: the height of plants, the number of shoots of the first order, the number of inflorescences on plants were measured. Under laboratory conditions, when isolating seeds, the following characteristics were taken into account: the number of inflorescences per plant, the weight of seeds per plant.

The digital data were processed by the method of variation statistics and one-way analysis of variance according to B.A. Dospekhov [9].

Results of the study

The architectonics (habitus) of the safflower bush was influenced both by the timing of sowing and the climatic conditions of the year of research. In 2020, plant height ranged from 55 cm at the first sowing date on March 20 to 35 cm at the fifth sowing date on May 2. At the same time, the number of lateral shoots of the first order varied from 8.7 to 2.8 pieces per plant, respectively. Conditions in 2021 were better. Against the background of high air temperature, 1.7 times more precipitation fell, which favorably affected the growth and development of plants.

Plant height in 2021 was about double that of 2020. The number of shoots of the first order varied from 10 pieces per plant in the first sowing period to 7 pieces per plant in the last, fifth sowing period on May 2 (tab. 2).

Table 2.

Architectonics of the safflower bush depending on the timing of sowing

Sowing term	Characteristic			
	Plant height, cm		Number of shoots of the 1st order, pcs.	
	2020	2021	2020	2021
1). 20.03	55.0±2.3	100.9±0.8	8.7±0.9	10.5±0.3
2). 27.03	41.5±2.4	98.0±0.8	4.5±0.6	9.9±0.4
3). 03.04	38.8±2.1	92.5±0.6	3.6±0.3	9.7±0.4
4). 14.04	37.7±1.6	85.6±1.3	3.2±0.2	9.5±0.3
5). 02.05	35.0±1.1	77.8±0.8	2.8±0.1	7.2±0.2

The formation of yield elements largely depends on the intensity of plant growth and the development of the assimilation apparatus. In 2020, the number of inflorescences per plant when sown on March 20 was maximum and amounted to 14 pieces per plant, with each subsequent sowing period, the number of heads per plant decreased and reached 4 pieces when sown on May 2. In accordance with this, the weight of seeds per plant varied from 2.8 to 0.3 g. In a more favorable 2021, the pattern of formation of yield elements remained, and the number of inflorescences per plant varied from 22 at the earliest sowing date on March 20 to 14 at the last sowing date on May 2. In 2021, plant productivity was significantly higher and amounted to 23.5 g per plant when sown on March 20, 6.6 g when sown on May 2. Plant productivity in 2021 was 8-20 times higher compared to productivity in 2020, a dry year (tab. 3).

Table 3.

Yield elements of dye safflower depending on the timing of sowing

Sowing term	Characteristic			
	Number of inflorescences per plant, pcs.		Weight of seeds per plant, g	
	2020	2021	2020	2021
1). 20.03	14.1±1.9	22.5±0.9	2.8±0.9	23.5±1.1
2). 27.03	5.9±0.7	22.0±1.0	1.1±0.3	20.8±1.1
3). 03.04	4.9±0.5	20.0±0.7	1.1±0.2	18.1±0.7
4). 14.04	4.8±0.2	17.8±0.7	0.5±0.1	16.6±0.8
5). 02.05	4.1±0.2	14.0±0.6	0.3±0.1	6.6±0.2

Table 4.

Yield of dye safflower depending on sowing time, 2021, ATF training field

Sowing term	Productivity, c/ha	
	2020	**2021**
1). 20.03	4.4	33.7
2). 27.03	1.7	30.5
3). 03.04	1.6	26.7
4). 14.04	0.8	24.2
5). 02.05	0.4	10.1
F fact.	22.52	191.9
F theor.	3.84	3.84
NSR $_{05}$, c/ha	**0.95**	**1.85**

An analysis of the data in Table 4 showed that the yield of safflower when sown on March 20 in 2020 is significantly higher compared to the rest of the sowing dates. The yield obtained during sowing in the second - fifth terms is very low, varying from 1.7 to 0.4 c/ha. Taking into account NSR $_{05}$ equal to 0.95 c/ha, the yield of the second and third sowing terms is significantly higher than in the fifth.

The climatic conditions of 2021 favorably influenced the growth and development of safflower, the yield was very high, varied from 33.7 c/ha at the first term to 10.1 c/ha - at the fifth sowing term, the same pattern was observed: the earlier planting, the higher the yield.

Conclusions

The best time for sowing safflower under Transnistria conditions, according to the results of studies in 2020 and 2021, was the first, March 20. The earliest sowing date had a positive effect on the growth and development of plants, which affected the formation of the highest yield in the experiment: 4.4 c/ha in the most severe drought in 2020 and 33.7 c/ha in 2021, which is favorable in terms of climatic conditions.

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DOI 10.34660/INF.2022.42.26.030
UDC 622.283.9

VISCOELASTIC BUFFER FLUIDS FOR WELL CASING ENHANCEMENT

Agzamov Farit Akramovich
Doctor of Technical Sciences, Full Professor,
Loginova Marianna Evgenievna
Candidate of Physico-mathematical Sciences, Associate Professor,
Ufa State Petroleum Technological University

Abstract. *One of the effective mud fluids used in well casing is viscoelastic systems that provide the best displacement of the drilling fluid by the cementing fluid during cementing. At the same time, it is important to correctly assess the characteristics of these systems, which makes it rational to plan their composition.*

To obtain new characteristics of these process fluids, a set of studies was carried out, which made it possible to optimize the concentration of the crosslinker, in this case, sodium dichromate, which gives the highest viscosity of the obtained buffer fluid based on polyacrylamide (PAA). The test procedure can be successfully used for other combinations of polymers and crosslinkers.

The studies used a high-precision HAAKE MARS III rheometer, which made it possible to obtain the rheological characteristics of these systems using the main types of tests, such as shear test, oscillatory and frequency test, creep test and recovery.

Keywords: *buffer fluid, viscoelastic fluids, rheology, polymers, crosslinkers, viscosity and flow curves, viscoelastic behavior.*

Introduction

The term "viscoelastic" refers to materials that have both viscous and elastic properties, i.e. such materials partially return to their original shape when the applied force is removed. Unlike many technological fluids used in drilling, viscoelastic systems have normal stresses, and their flow does not obey Newton's laws, the Shvedov-Bingham equation, or the Oswald power model [1, 2]. Due to normal stresses, viscoelastic fluids are able to move throughout the entire volume of the pipe or annular space, completely filling it. This is very important in the construction of wells with a complex profile and large deviations from the vertical, in which there are serious problems when cementing casing strings, primarily associated with cleaning the wellbore and ensuring the most complete displacement of the drilling fluid by the cement slurry. Traditionally used buffer fluids are not al-

ways effective due to unsatisfactory rheological properties, which do not provide the required flow profile and flow regime of the buffer system in the annulus [3, 4, 5]. The experience of well construction has shown that one of the most effective buffer fluids are viscoelastic systems, which, due to normal stresses, during cementing, displace drilling fluid even from pinched zones [3-5]. At the same time, there are difficulties with the design of viscoelastic fluids (VEF) due to ignorance of their behavior under various loads. The study of the internal structure of the VEF by examining the rheological properties was the task of this work.

Traditionally, viscoelastic fluids are prepared on the basis of high molecular weight polymers crosslinked with salts of polyvalent metals. To impart specific properties, various fillers and additives can be additionally introduced into them. The most widely used polymers are widely used in various industries, including well drilling. The production of polymeric materials is growing every year, the number of types of polymers is increasing, and their properties are improving, making it possible to vary the composition of process fluids depending on the formulated goals [6–8].

Research methods and objects, experimental equipment

The rheological characteristics of viscoelastic fluids were studied using a high-precision HAAKE MARS III rheometer using the plane-to-plane method (figure 1), where shear stress is defined as $\tau = \frac{F}{A}$, and strain as $\gamma = \frac{S}{h}$.

On this equipment, the rheological characteristics of these systems were obtained using the main types of tests, such as shear test, oscillator and frequency test, creep test and recovery.

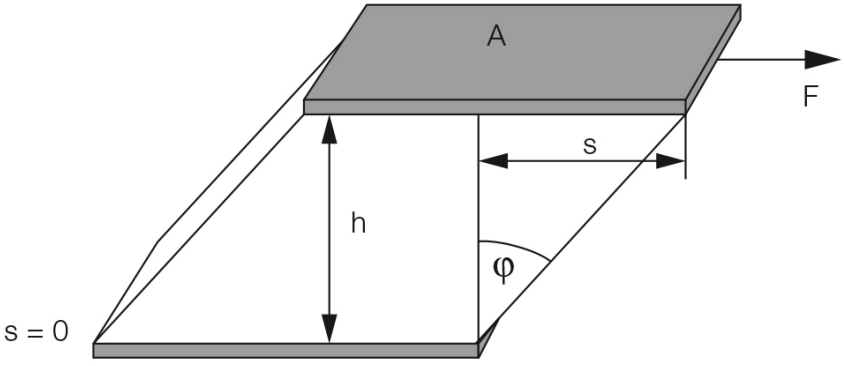

Figure 1. *Two plane model. Shear test*

In the presented work, studies of samples of two solutions based on polyacrylamide (PAA) are presented. Solution №1 – 4.5% PAA with 0.5%$Al_2(SO_4)_3$, and solution №2 – 4.5% PAA with 1% sodium bichromate.

The effect of $Na_2Cr_2O_7$ dichromate concentration on the viscous properties of Flodrill PAM 1040 and Flodrill PAM 705 polyacrylamide (PAA)-based viscoelastic buffer fluid was studied by the shear test method. The solution preparation method included:

- heating of technical water to a temperature of 60-80°C;
- slow introduction of metal salt with constant stirring, at low speeds;
- slow addition of PAA and subsequent intensive mixing, at high speeds;
- holding buffer liquid at rest for 30 min.

When measuring in *oscillation mode*, the material is subjected to a sinusoidal voltage (figure 3).

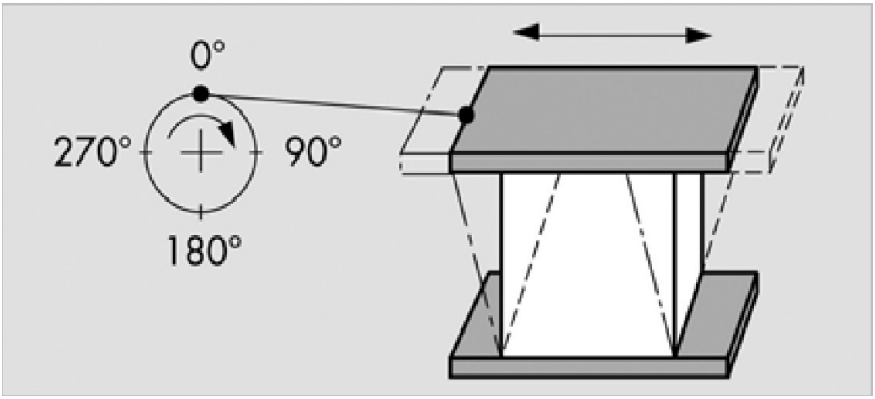

Figure 2. *Oscillatory test*

Figure 2 shows a schematic diagram of the oscillatory measurement process using a two-plane model as an example: the lower plane is at rest, while the upper one is oscillating harmonically. These tests belong to the class of measurements that do not destroy the structure of matter. When reaching a position of 90° or 270°, the upper plane deviates as much as possible from the initial position, called the oscillation amplitude. Other important parameters to be set are shear stress and strain. To find the shear stress, it is necessary to divide the value of the torque applied to the upper plane by its area. The strain value is calculated as the ratio of the displacement of the planes relative to the initial position to the thickness of the gap. Using this method allows you to determine the properties of substances with a three-dimensional structure (gels), or substances with elastic properties (material is not kept in the measuring gap).

In addition, oscillatory measurements help reveal differences in material properties that are not found in steady-flow experiments. It is possible to separately determine the viscous and elastic properties of the material, while in steady flow only integral characteristics are determined.

During the test, the following happens. The sinusoidal action is determined by two quantities: the amplitude τ_0 and the oscillation frequency ω. The oscillation frequency has a great influence on the duration of the experiment. The reciprocal of the frequency determines the time of one period. For example, the period of a sinusoidal oscillation with a frequency of 0.001 Hz would require 1000 s. Applying stress τ to the sample will cause it to deform. In this case, depending on the ratio of viscous and elastic properties of the material, a phase shift will be observed between stress τ_0 and deformation γ_0. In industry, frequency = 10 Hz is used as the value of the constant angular frequency [9, 10]. Angular frequency ω in rad/s or s^{-1}, and frequency ν in Hz, which are correlated by the relation $\omega=2\pi\nu$.

Purely elastic materials have zero shear angle. Purely viscous materials have a phase angle (δ) of 90°.

Viscoelastic materials correspond to average values between 0° and 90°. The following ratio is used for calculations:

$$\tau_0=G^*\cdot\gamma_0. \quad (2.1)$$

G^* is known as the complex modulus calculated from the values of the applied stress and the resulting strain.

The storage modulus G' and the loss modulus G'' are calculated from the value of the phase shift angle, which is determined from the measured time interval between the stress and time strain amplitudes. G' indicates that the voltage energy was temporarily stored during the test and can be returned later. The storage modulus G' characterizes the elastic properties of the material: $G'=G^*\cdot\cos\delta$.

The loss modulus G'' indicates that the energy used to initiate the flow has irreversibly turned into heat. G'' characterizes the viscous properties of the material: $G''=G^*\cdot\sin\delta$.

Changing the oscillation frequency allows you to get a response from the structural elements of different scales, when their characteristic relaxation times correspond to the rate of change in the shear stress (which depends on the frequency). The response of the system may differ from a sinusoid or be strongly distorted as a result of mechanical processes occurring in the sample, which are described by nonlinear relationships. The distorted signal is practically impossible to interpret correctly, so only processes that occur in the range of linear elasticity of the system under study are of value, when the deformation is directly proportional to the applied stress ($\tau = G\gamma$) - the linear measurement range (LMR). This fact leads to the need to determine the measurement mode (oscillation frequency, moment of force) under which the condition of linear viscoelasticity is satisfied.

It has been experimentally established that for polyacrylamide solutions in the concentration range of 4%-4.5%, the following experimental parameters are acceptable: oscillation frequency 1 Hz, moment of force from 5 to 100 mN m. The range of linear viscoelasticity can be considered within the Maxwell model [2]:

$$\tau = \tau_0 \cdot \exp(-t/\frac{\eta}{G})$$

where τ_0 is the initial applied shear stress; G shear modulus; η viscosity; $\eta/G = t_p$ relaxation time.

Within the linear range region, at any given time, strain values are proportional to the applied stress. Assuming that elasticity can be associated with fluctuation engagements of entangled macromolecules, the proportionality between stress and strain can be understood as the ability of a spatial wall to elastically deform while maintaining its integrity. The deformation energy is reversibly accumulated inside the grid and can be released when the stress is removed.

When using higher stresses, the network of fluctuation nodes is deformed above the limit of its mechanical strength, the disentangling of individual macromolecules begins, with a constant change in their relative position, and as a result, the sample flows and its viscosity decreases under the influence of shear stress. Thus, high stresses lead to a decrease in toughness as a result of a disproportionate increase in strain.

During oscillatory measurements, data are obtained on the angle of rotation of the upper platform in the range of 9×10^{-5} – 0.06 rad. For the studied compositions, G* varies in the range of 0 – 300 Pa, τ in the range of 0 – 70 Pa. The device allows measurements with a sweep in voltage amplitude (sweep τ) and oscillation frequency (sweep ω).

Results of the study

The rheological characteristics of the VES were studied at the following ratios (by weight) of $Na_2Cr_2O_7$ to PAA 1:1; 3:4; 1:2; 1:4; 1:6; 1:8; 1:16 at 25°C. The volume of water did not change and remained 150 ml. Shear rates were chosen in accordance with the fluid flow rates that occur during cementing of real wells, namely, in the tubular space (500 s^{1}) and the annulus (227 s^{-1}).

When evaluating the role of the concentration of polyvalent metals, it was found that in order to obtain a structure with the required strength and toughness, it is necessary to take into account the valency of the metal. The greater the valence of the metal, the smaller the amount of this additive must be applied. However, at high concentrations of the additive, especially for polyvalent metals, the polymer quickly coagulates. Since PAA is polycondensed, its network structure becomes more complete, which in turn gives water molecules little space for assimilation [6]. Subsequently, the polymer precipitated in the form of beads.

An evaluation of the role of sodium dichromate on VES viscosity is shown in figure 3.

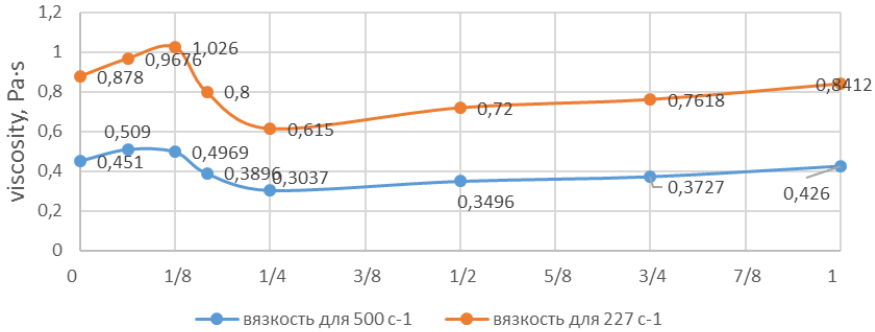

Figure 3. *Effect of $Na_2Cr_2O_7$ on the viscosity of a viscoelastic fluid*

An analysis of the figure shows that at the ratio $Na_2Cr_2O_7$: PAA (1:8), the viscosity of the buffer liquid is optimal [1].

The results of oscillatory tests of solutions based on PAA with two types of crosslinker, namely, sodium bichromate $Na_2Cr_2O_7$ are shown in figure 4 and aluminum sulfate $Al_2(SO_4)_3$ are shown in figure 5).

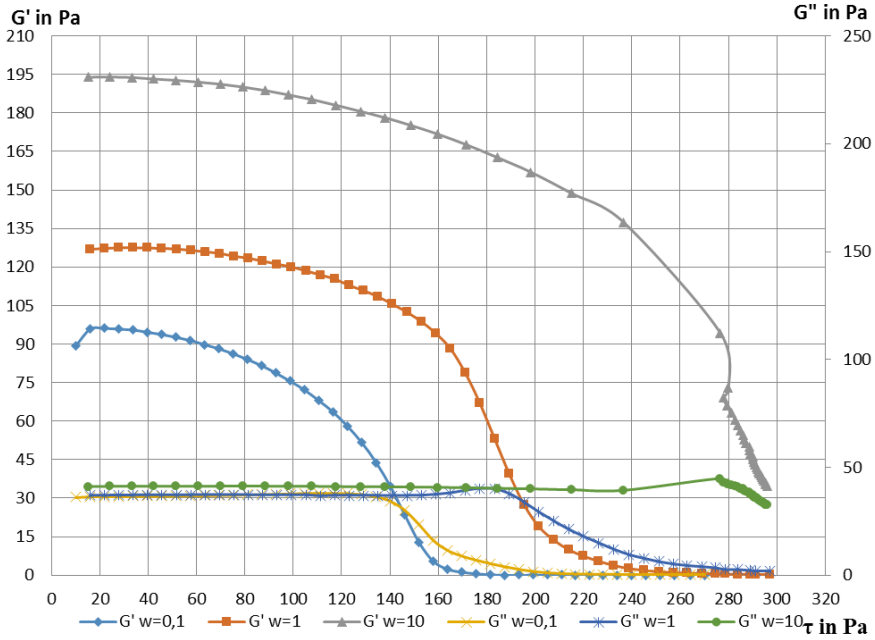

Figure 4. *Oscillation tests (sweep τ) of PAA-based formulations with the addition of sodium bichromate*

When examining a sample in oscillation mode, the first test is always an amplitude sweep, which allows you to determine the range of linear viscoelasticity ((LMR) LVE-range). Knowing this information, it is possible to determine the range of strain values in which the structure of the test sample is not destroyed under external influences. From figure 4, in the amplitude sweep in the LVE range, the graphs of the accumulation and loss modules run parallel to the X axis, i.e. for a sample based on PAA and sodium bichromate, a stress of 40 Pa, showing that for this sample the yield strength is 40 Pa. This is the stress at which strains continue to increase without increasing load. After passing this value, irreversible plastic deformations begin to occur in the solution. In addition, flow points are observed in figure 3 - these are the values at *G'= G''*. At At ω =0.1 Hz τ_F=140 Pa, ω =1 Hz τ_F=190 Pa, ω = 10 Hz τ_F = 300 Pa.

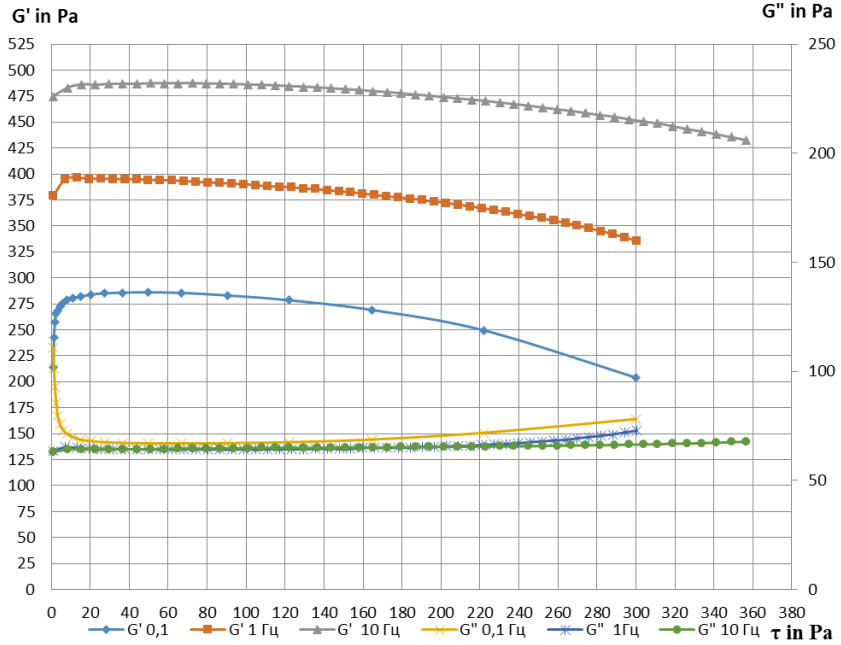

Figure 5. *Oscillation tests (sweep τ)of compositions based on PAA with the addition of aluminum sulfate* $Al_2(SO_4)_3$

In figure 5, in the amplitude sweep in the LVE range for the composition based on PAA with aluminum sulfate, the yield strength is 110 Pa, which characterizes the stress at which the deformations continue to increase without increasing the load. In addition, in figure 5, one flow point is observed in the same coordinates - these are the values at *G'=G''*at ω =0.1 Hz$_{\tau F}$=305 Pa.

During oscillatory measurements, the LMR range was determined and the frequency sweep of the samples under study was built (fig.6-7). Most oscillation measurements are made in the strain control (CSD) mode. Measurements in the oscillatory mode provide unique information about the rheological characteristics of the sample, due to the possibility of separating the elastic and viscous components. The elastic modulus (storage modulus) G' characterizes the accumulated strain energy in the system and reflects the characteristics of the sample as a solid body (the elastic component). The value of the viscous modulus (loss modulus) G" determines the energy dissipation and is responsible for the behavior of the sample as a liquid (viscous component). The measurement of these two parameters is most often of interest to researchers when conducting an oscillation test. The long-term storage stability of dispersions is evaluated at low frequencies, so the PAA dichromate solution is fairly stable. The frequency sweep mode is used to study the behavior of samples at different exposure times. Setting high frequency oscillations corresponds to a short exposure time, and low - to a long exposure. The shape of curves G' and G" gives information about the internal structure of the sample.

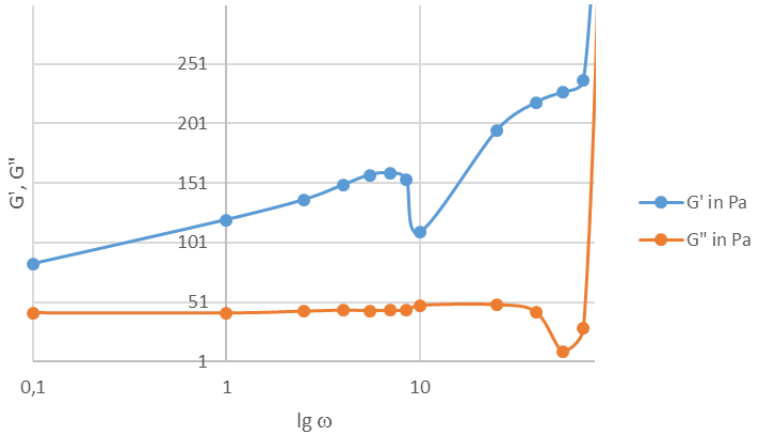

Figure 6. *Frequency sweep (sweep ω) of a PAA formulation with the addition of sodium bichromate*

It can be seen from the graphs that both solutions have *G'>G''*, which indicates a gel-like structure of a viscoelastic liquid, and the elastic properties are better for a solution with a crosslinker of aluminum sulfate $Al_2(SO_4)_3$, since the storage modulus (modulus of elasticity) is higher than a solution with sodium bichromate.

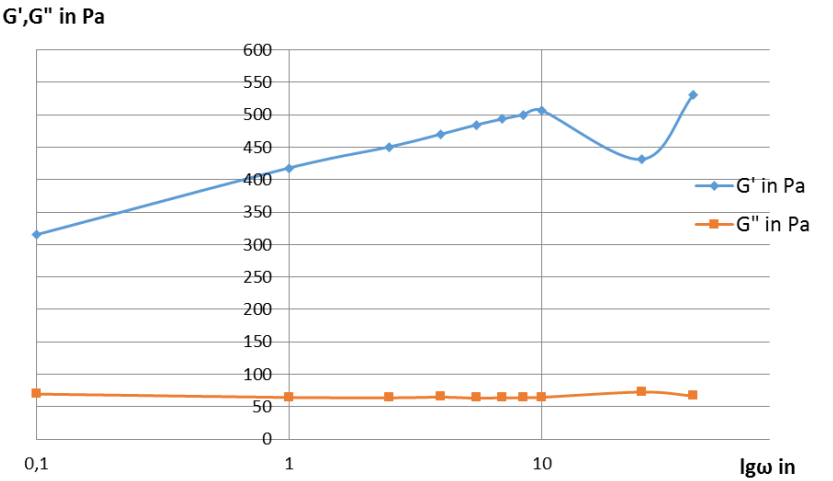

Figure 7. *Frequency sweep (sweep ω) of a PAA-based composition with the addition of aluminum sulfate $Al_2(SO_4)_3$*

From the oscillation measurements, the complex dynamic viscosity *η*,* was also obtained, reflecting the total resistance to dynamic shear, and its dependence on shear rate is presented in figure 8. In the low shear region, the viscosity values in the PAA solution with $Al_2(SO_4)_3$ practically do not change (the Cox-Mertz rule [11–12]), which is not observed in the solution with bichromate. All this shows a certain stability at rest.

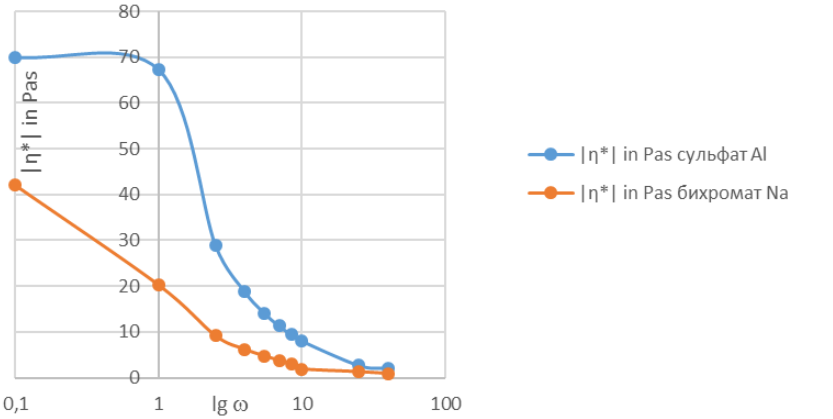

Figure 8. *Frequency curve of the complex viscosity of the studied solutions based on PAA with the addition of 0.5% $Al_2(SO_4)_3$ (blue) and 1% sodium dichromate (orange)*

Using the creep and stress recovery method for the studied viscoelastic fluids, a new indicator was determined - the "response time" of the system. Under the influence of a constant shear stress τ_0 - the yield strength applied to the upper plane of the sample, the latter twists. The angle of such twisting is determined by the modulus of elasticity. Stress and resulting strain are linearly related: doubling the stress results in doubling the strain. For example, when twisted, such a rubber sample behaves like a metal spring that stretches or compresses under load. The deformation persists as long as the stress is applied, and completely and instantly disappears when the load is removed. The strain energy stored elastically in a spring or in a rubber sample can be returned to 100% when the load is removed. The dependence of the load (strain) on the time of solution № 1 is schematically shown in figure 9.

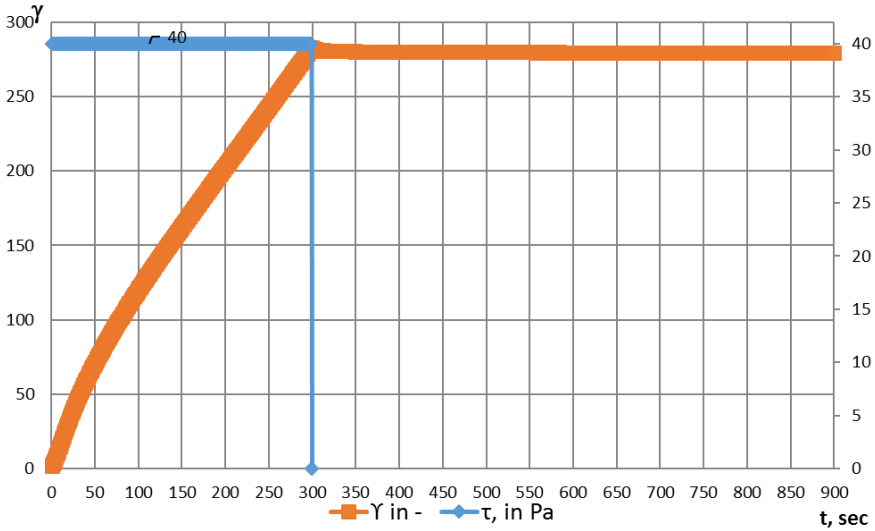

Figure 9. *Dependence of creep and recovery of PAA solution with sodium dichromate*

By the nature of the behavior, this viscous reaction. Simplified, this effect can be shown as follows. Imagine that the solution is poured from the vessel onto the surface of the table and forms a puddle that spreads until the layer becomes thin and the surface tension at the interface stops this process. It is obvious that the kinetic energy of the solution flowing onto the table surface and the gravity of the layers cause the solution to flow, but when this energy is completely spent, it will stop flowing. Lacking elasticity, this solution will not flow back. The energy that set the solution in motion has completely turned into heat, i.e. the energy cannot

be restored. The recovery phase is a straight line.

Figure 10 shows the dependence of creep and recovery of solution №2, which is characteristic of a viscoelastic fluid. Judging by the response to applied stress (110 Pa), viscoelastic fluids, which can be considered as dispersions of macromolecules with spring-like segments in high viscosity oil, are characterized by a behavior that is somewhere between a purely elastic or purely viscous body.

The time-strain curve first increases rapidly, and then its slope gradually decreases. Subsequently, this curve asymptotically becomes a straight line with a constant slope, which indicates a fully viscous response to the applied stress.

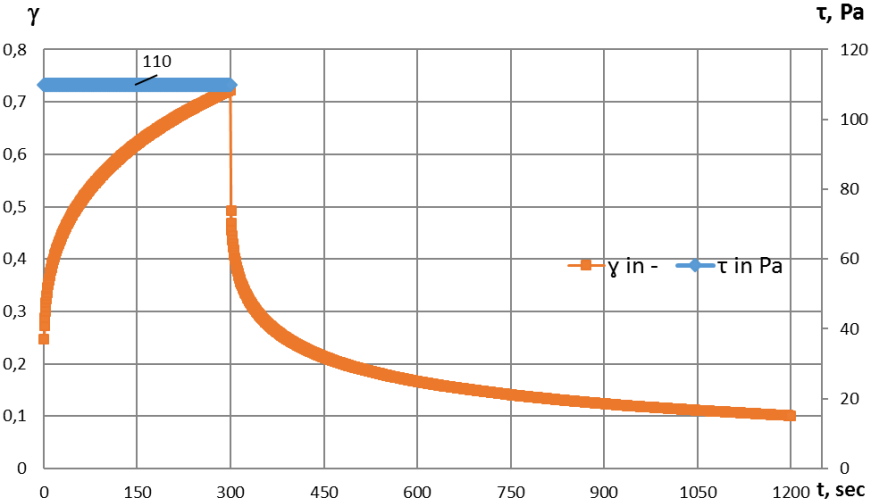

Figure 9. *Dependence of creep and recovery of PAA solution with aluminum sulfate*

If a specimen that is a viscoelastic (viscoplastic) solid is subjected to a stress below the yield point and the strain eventually asymptotically reaches a constant value, the strain curve will be parallel to the time axis.

When measuring the creep of a viscoelastic fluid under the action of an applied stress, the transient processes as a whole are evaluated, while the individual contributions of the elastic and viscous components cannot be clearly established. This is the advantage of the next phase - recovery after stress relief, which makes it possible to estimate the percentage of the viscous and elastic components in the total deformation of the sample. The recovery phase, like the creep phase, is highly dependent on time.

Thus, the complex of studies carried out made it possible to obtain new previously studied characteristics of viscoelastic fluids used in well casing, and will

allow more reasonable design of the compositions of buffer process fluids to improve the quality of casing string cementing in wells drilled in difficult mining and geological conditions.

Conclusions

1. Viscoelastic liquids are a structural network of polymers bonded together by polyvalent metal ions. A feature of these systems is the presence of normal stresses. Due to normal stresses, they are able to move throughout the volume.

2. It has been established that during the movement of a viscoelastic fluid, the concentration of a metal ion and its valence affect its structural properties.

3. In the range of ratios of polyvalent chromium metal and PAA in the ratio of 1:8-1:16, the maximum value of the viscous properties of the test solution is observed.

4. When different crosslinkers are added to the PAA solution, the LMR changes. For solution №1 LMR the LMR is limited to 40-45 Pa and three points of flow are observed, these are the values at $G'= G''$: at ω =0.1 Hz τ_F=140 Pa, ω =1 Hz τ_F=190 Pa, ω =10 Hz τ_F=300 Pa. For solution №2 LMR is limited by a limit stress of 110 Pa and one flow point is observed at $G'= G''$: ω =0.1 Hz τ_F=305 Pa.

5. The yield strengths of the studied solutions based on PAA with the addition of 0.5% $Al_2(SO_4)_3$ -110 Pa and 1% sodium dichromate - 40 Pa were obtained.

The creep and recovery curves of the studied samples showed that solution № 1 has a viscous reaction, and solution № 2 has a viscoelastic reaction.

The obtained new characteristics of viscoelastic fluids will make it possible to design compositions of more effective buffer fluids and improve the quality of well casing.

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DOI 10.34660/INF.2022.73.40.031

THE FALL OF THE CHELYABINSK METEORITE: TELEPHONE TRAFFIC IN AN EMERGENCY SITUATION

Novikov Vladislav Vladimirovich
Associate Professor
South Ural State University, Chelyabinsk, Russia
Novikov Ivan Vladislavovich
Lecturer
South Ural State University, Chelyabinsk, Russia
Novikova Mariia Vladislavovna
Lecturer
Czech University of Life Sciences, Prague, Czech Republic

Abstract. *On February 15, 2013 at 09:20 a large meteorite fell in the Chelyabinsk region. Upon entering the dense layers of the atmosphere at an altitude of 40 km, the meteorite exploded. Many people received shrapnel wounds from broken glass and required medical attention. After the shock wave, the city with a population of one million people froze for a few seconds, and then began to actively and simultaneously call emergency services, relatives and friends. Telephone traffic began to increase. The load on the landline and cellular telephone networks peaked. The purpose of the study was to collect and analyze telephone traffic data during an emergency, choose a mathematical expression to determine the characteristics of telephone traffic during an emergency, and characterize the quality indicators of landline and cellular telephone networks during an emergency.*

Keywords: *Chelyabinsk; meteorite; traffic; telephone; networks.*

Introduction

On February 15, 2013 at 09:20 a large meteorite fell in the Chelyabinsk region [1, 2, 3]. Upon entering the dense layers of the atmosphere at an altitude of 40 km, the meteorite exploded. The explosion was accompanied by a bright flash of light and a powerful shock wave. A bright light illuminated the streets and buildings of Chelyabinsk, and people rushed to the windows. A few dozen seconds later, an air shock wave came to the city. The shock wave broke window panes, damaged the facades and entrances of buildings. The wall of one building was completely destroyed [4, 5]. Many people received shrapnel wounds from broken glass and

required medical attention. After the shock wave, the city with a population of one million people froze for a few seconds, and then began to actively and simultaneously call emergency services, relatives and friends [6, 7].

Telephone traffic began to increase. The load on the landline telephone networks peaked, but the landline networks handled all subscriber calls. Cellular networks were overloaded and could not cope with the load. Subscribers could only get through on their fifteenth or twentieth attempt.

The purpose of the study was to collect and analyze telephone traffic data during an emergency, choose a mathematical expression to determine the characteristics of telephone traffic during an emergency, and characterize the quality indicators of landline and cellular telephone networks during an emergency.

Materials and methods

In Chelyabinsk, there are five telephone operators: one landline telephone operator and four cellular telephone operators. For our study, we collected the telephone traffic data from February 15, 2013 from 9:00 to 10:00 of four telephone operators: one landline telephone operator and three cellular telephone operators [8, 9, 11, 12].

Results and discussion

The data on the average load on the switching equipment of the landline telephone operator from 9:20 to 9:40 with 1-minute intervals are given in Tables 1 and 2.

Table 1.

Average load on the switching equipment of the landline telephone operator from 9:20 to 9:30 at 1-minute intervals

Time	9:20–9:21	9:21–9:22	9:22–9:23	9:23–9:24	9:24–9:25	9:25–9:26	9:26–9:27	9:27–9:28	9:28–9:29	9:29–9:30
Average load, Erlang	20712	21451	22017	23002	23370	23664	23782	23848	23725	23536

Table 2.

Average load on the switching equipment of the landline telephone operator from 9:30 to 9:40 at 1-minute intervals

Time	9:30–9:31	9:31–9:32	9:32–9:33	9:33–9:34	9:34–9:35	9:35–9:36	9:36–9:37	9:37–9:38	9:38–9:39	9:39–9:40
Average load, Erlang	23985	23542	23647	23639	23762	23891	23880	23848	23804	23903

The data on the average load on the switching equipment of the first cellular telephone operator from 9:20 to 9:40 with 1-minute intervals are shown in Tables 3 and 4.

Table 3.

Average load on the switching equipment of the first cellular telephone operator from 9:20 to 9:30 at 1-minute intervals

Time	9:20–9:21	9:21–9:22	9:22–9:23	9:23–9:24	9:24–9:25	9:25–9:26	9:26–9:27	9:27–9:28	9:28–9:29	9:29–9:30
Average load, Erlang	6790	7580	13072	25665	32417	33073	34781	33950	34959	33544

Table 4.

Average load on the switching equipment of the first cellular telephone operator from 9:30 to 9:40 at 1-minute intervals

Time	9:30–9:31	9:31–9:32	9:32–9:33	9:33–9:34	9:34–9:35	9:35–9:36	9:36–9:37	9:37–9:38	9:38–9:39	9:39–9:40
Average load, Erlang	34244	33523	34898	34414	32886	32357	31931	31710	30217	29599

The data of the average load on the switching equipment of the second cellular telephone operator from 9:20 to 9:40 with 1-minute intervals are given in Tables 5 and 6.

Table 5.

Average load on the switching equipment of the second cellular telephone operator from 9:20 to 9:30 at 1-minute intervals

Time	9:20–9:21	9:21–9:22	9:22–9:23	9:23–9:24	9:24–9:25	9:25–9:26	9:26–9:27	9:27–9:28	9:28–9:29	9:29–9:30
Average load, Erlang	7040	6595	13444	27609	32440	33347	34252	34242	34081	34278

Table 6.

Average load on the switching equipment of the second cellular telephone operator from 9:30 to 9:40 at 1-minute intervals

Time	9:30–9:31	9:31–9:32	9:32–9:33	9:33–9:34	9:34–9:35	9:35–9:36	9:36–9:37	9:37–9:38	9:38–9:39	9:39–9:40
Average load, Erlang	34904	33415	34889	32922	32766	32454	31658	31959	30452	29985

The data on the average load on the switching equipment of the third cellular telephone operator from 9:20 to 9:40 with 1-minute intervals are given in Tables 7 and 8.

Table 7.

Average load on the switching equipment of the third cellular telephone operator from 9:20 to 9:30 at 1-minute intervals

Time	9:20–9:21	9:21–9:22	9:22–9:23	9:23–9:24	9:24–9:25	9:25–9:26	9:26–9:27	9:27–9:28	9:28–9:29	9:29–9:30
Average load, Erlang	7058	6523	14905	26737	31653	34315	33606	34471	34040	34462

Table 8.

Average load on the switching equipment of the third cellular telephone operator from 9:30 to 9:40 at 1-minute intervals

Time	9:30–9:31	9:31–9:32	9:32–9:33	9:33–9:34	9:34–9:35	9:35–9:36	9:36–9:37	9:37–9:38	9:38–9:39	9:39–9:40
Average load, Erlang	34844	34544	34702	34186	32857	32415	31732	31829	30100	29298

The results of the analysis of changes in the average load for a landline telephone operator are shown in Figure 1. The average load increases according to the logarithmic law log(t) and stabilizes before reaching the maximum possible value.

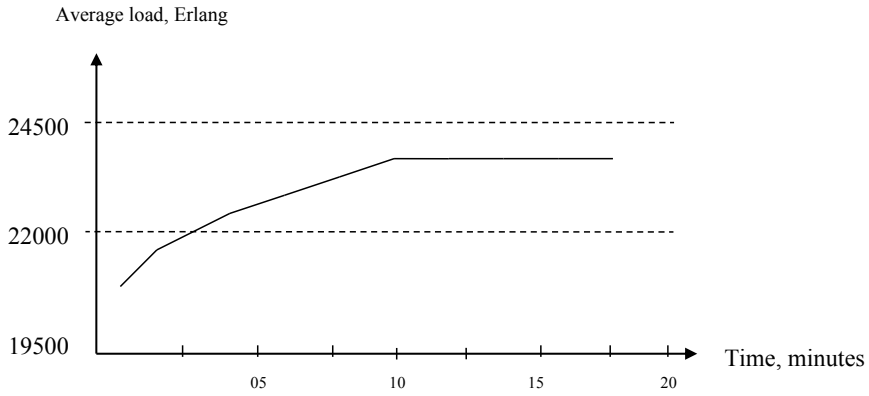

Figure 1. *Results of the analysis of changes in the average load for a landline telephone operator*

The results of the analysis of changes in the average load for the first cellular telephone operator are shown in Figure 2. The average load increases exponentially by the e^t law and, having reached the maximum possible value, enters the limit area.

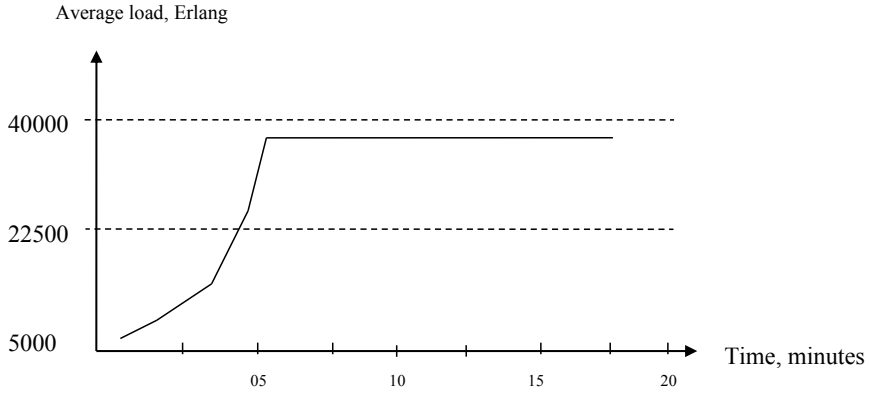

Figure 2. *Results of the analysis of changes in the average load for the first cellular telephone operator*

The results of the analysis of changes in the average load for the second and third cellular operators are similar to the results shown in Figure 2.

Conclusions

Based on the results of the study, the following conclusions can be drawn about emergency situations:

1) landline telephone networks remain operational;
2) landline telephone networks process all incoming calls;
3) cellular telephone networks do not remain operational;
4) cellular telephone networks do not process most of the incoming calls.

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DOI 10.34660/INF.2022.12.36.032

BELASHOV'S WIND POWER PLANT, SELF-REGULATING IN HEIGHT AND INTERLOCKING IN AREA

Belashov Alexey Nikolaevich
Theoretical Physicist
ORCID 0000-0002-4821-8004

Abstract. *The article is devoted to green energy, in particular, a wind power plant with two interlocking sliding farms with numerous identical modules for generating electrical energy from a fluid source consisting of various wind flows in open spaces, which are located on a fixed tower. Self-adjusting trusses with multiple modules can be moved along the entire height of the tower to protect the wind power plant from strong and extreme wind currents, carry out repair or maintenance work at the foot of the fixed tower. A wind power plant is a unified device for generating electrical energy that allows, during operation, to automatically change and adjust the height of sliding farms with a plurality of installed modules, change their surface area, the design size of each module, its load and the number of revolutions of the screws of all modules of the wind power plant. The wind power plant is designed in green energy for use in industry and the national economy as a wind turbine of various capacities.*

Keywords: *wind power plant, wind energy plant, wind turbine, wind engine, power plants.*

Since ancient times, humanity has been interested in ways to obtain energy from natural sources of a fluid medium located on planet Earth and related to green energy, which does not cause much harm to the environment. There are many inventions and scientific discoveries in this area, but there are still a lot of questions in the implementation of these scientific projects. Such numerous issues include the efficiency of wind power plants, the method of obtaining and transmitting the received energy over a distance without unnecessary losses, the noise of wind power plants, their interference with electronic devices, and also how they affect the well-being of living organisms located nearby.

The purpose of this invention is the unification of structural technical structures of identical modules, reducing the cost of their production and increasing the productivity of modular wind power plants operating from a source of fluid consisting of wind flows. Improving the quality and availability of maintenance

and repair of individual modules of wind turbines.

When inventing and manufacturing certain devices, there are a lot of technical and design subtleties that many inventors and designers do not take into account. For example, if a wind power plant performs work at a given movement of the wind flow, at a given humidity and a given distance from the earth's surface, then depending on the type of generator there will be different indicators of the power it gives off.

For example, let's compare two generators producing work = 100 N·m at a given number of revolutions.

We know that the work done by the multi-turn windings of the first generator per unit time is

$$A = F \cdot S$$

where:

A = 100 N·m

F = 10 N

S = 10 m

We know that the work done by the multi-turn windings of the second generator per unit time is

$$A = F \cdot S$$

where:

A = 100 N·m

F = 1 N

S = 100 m

Now a natural question arises, from which generator we will receive more electrical energy without loss. I know from personal experience that in order to get work = 100 N·m from the first generator, we need a generator with a large number of multi-turn windings, which will lead to an increase in internal resistance, both active and reactive, which is unacceptable for us. To get work = 100 N·m from the second generator, we need a generator with a smaller number of multi-turn windings of large diameter, which will lead to a decrease in internal resistance, both active and reactive, which is a positive fact for us.

Belashov's universal electric machine is known, containing a housing with an even or odd number of modules, each module includes a rotor with magnetic systems and magnetic circuits, a stator with multi-turn windings, an automatic tracking and control system, rolling or sliding elements. See patent of the Russian Federation № 2118036, Cl. H 02 K 23/54 - analogue.

Belashov's universal electric machines with a dielectric (diamagnetic) stator have a great advantage over electric machines, in which the stator is made of ferromagnetic material in that they have:

- good cooling
- modular design,

- high degree of reliability,
- reliable insulation resistance,
- small dimensions and light weight,
- generator, can determine the voltage of the incoming signal,
- dielectric stator, generator has no hysteresis losses,
- the dielectric stator has no reactance losses,
- dielectric stator, generator has no eddy current losses,
- the generator module can be easily adjusted for current and voltage,
- the generator module can be manufactured from a few watts to hundreds of kW,
- the consumer can independently complete, from separate modules, any parameters of the machine,
- generator modules can have a monitoring and control system that can automatically change the parameters of the machine,
- generator modules can operate from one or several independent sources of different voltage and current, and in southern countries from the energy of solar panels.

On the basis of Belashov's modular generators, a new Belashov's wind power plant was invented, which allows using separate modules to create high voltage and transmit it without large losses over long distances, where consumer receiving points on site will convert the DC electrical signal into the voltage required for the customer, the specified power and set frequency.

At the same time, it should be taken into account that the transmission of direct voltage over long distances from a variety of wind power plants is the most economical method of accumulating electrical energy in a conductor. If there is no consumption of electrical energy from the DC conductor from consumers, then the DC voltage from the multitude of wind power plants in the conductor will increase and accumulate, which acts as an electrical energy storage device, but this phenomenon can only be ensured if there are many modular Belashov's generators, since when operating modular generators as a generator of direct or alternating current, it is possible to change the design value of low-speed generators during the operation of the wind power plant, namely, during their operation, connect in series or parallel multi-turn windings of each stator and individual generator modules.

Based on the Belashov's wind turbine containing two wind wheels with rotary blades, a generator module, a wind wheel speed synchronization mechanism and a wind orientation device, which are located on the same shaft. Moreover, the cylindrical head is connected with the support washer of the fixed tower with the help of sliding and supporting elements. See the patent of the Russian Federation № 2247860, Cl. F 03 D 1/00. Based on the inventions previously described in this article, a new type of more efficient wind power plant is proposed.

Belashov's wind power plant, Fig.1, consists of a tower 1 resting on the ground 2. Inside the tower 1 there is a chute 3 interacting with the holder 4, on which a truss 5 with a plurality of modules 6 and a truss 7 with a plurality of modules 8 are fixed. The lower base of the holder 4 rests on the movable platform 9 by means of rolling elements interacting with the fixed platform 10, which, moving along the tower 1, has an internal locking device in a given position and a movement mechanism. The upper base of the holder 4, when lifted into the working position, rests against the motion limiter 11. To reduce the cost of manufacturing the tower 1, the wind power plant can be additionally fixed to the base of the soil 2 using braces 12.

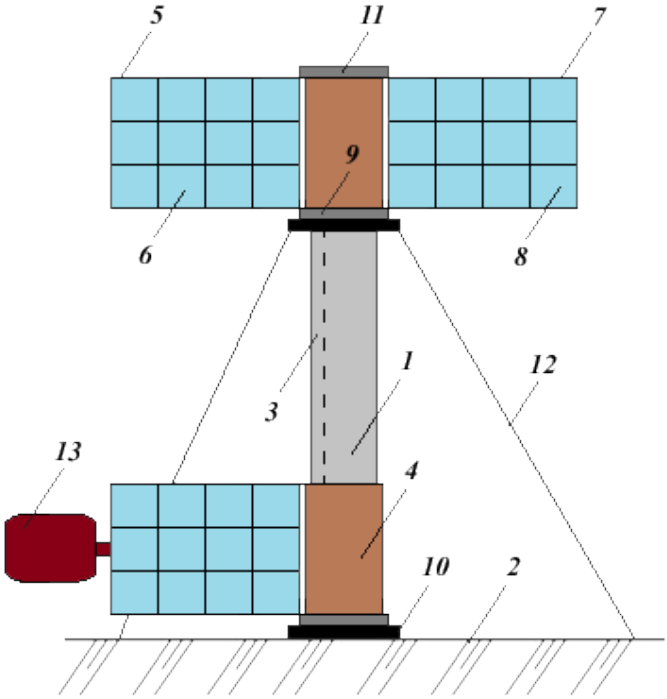

Figure 1.

The wind orientation device can be made in the form of an electronic device or a weather vane 13. In case of large gusts of wind, the farm 5 with a plurality of modules 2 and the farm 7 with a plurality of modules 8 can bend and close, reducing the load on the surface of the wind power plant, and in case of strong hurricanes or carrying out repair and maintenance work, they can sink to the lower level, leaning on the ground 2.

Many identical modules 6 and identical modules 8 of the Belashov's wind power plant, Fig.2, consist of body parts 14. One base of the housing 14 interacts with the generator shaft 16 through the rolling elements 15. A screw 17 is rigidly fixed on the generator shaft 16. The other base of the housing 14 through the rolling element 18 interacts with the generator shaft 16. The screw 20 is rigidly fixed on the generator housing 19. An air flow divider 21 is installed in front of the base of the housing 4.

Moreover, it should be emphasized that the air flows 22 rotate the screw 20 in one direction, and the air flows 23 rotate the screw 17 in the other direction and thereby increase the speed of rotation of the modules of the multi-turn windings of the generator 19.

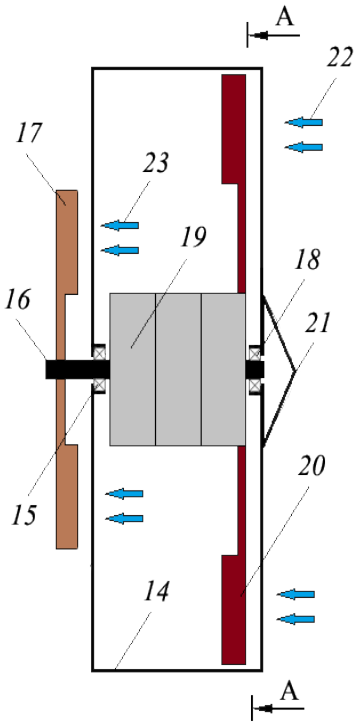

Figure 2.

Many identical modules 6 and identical modules 8 of the Belashov's wind power plant, Fig.3, located in the housings 14, are attached to the truss 5 and the truss 7 with the help of stiffeners 24 and mounting holes 25.

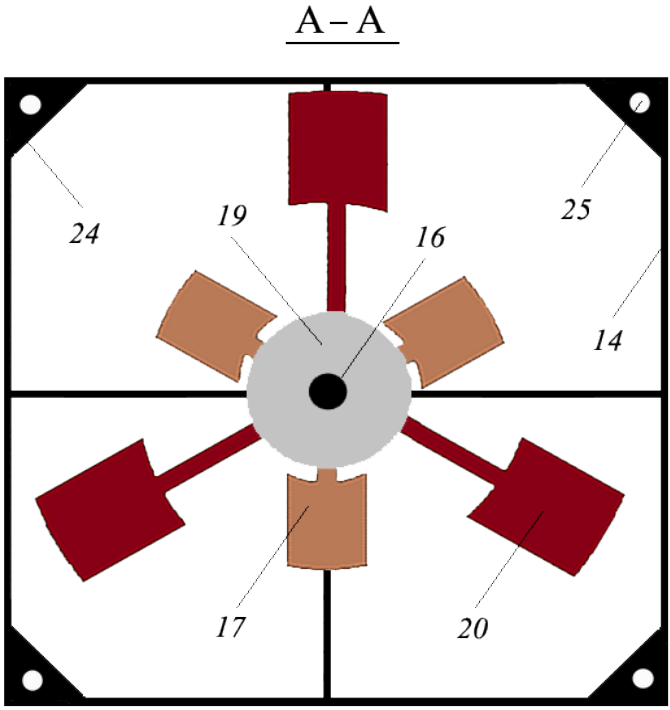

Figure 3.
The Belashov's wind power plant operates as follows

After installing the tower 1 and performing installation and adjustment work near the ground, a plurality of modules 6 are installed on the farm 5 and a plurality of modules 8 on the farm 7 and fixed on the holder 4. Further, with the help of a fixed platform 10 having a guide protrusion included in the chute 3, farms 5 and 7 are raised to the limiter of movement 11. Inside the protrusion of the fixed platform 10 located in the chute 3, there is an electric movement mechanism and a device for fixing the trusses in the working position. Further, with the help of a control and automatic control device, the truss 5 and truss 7 closed together are turned into the working position. During the normal movement of the wind flow, all modules of the wind turbine operate and produce an electrical signal of direct or alternating current of the required voltage. Depending on the speed of the wind flow, farm 5 and farm 7 with many modules can bend and automatically restore their original position. In strong gusts of wind, the truss 5 and the multi-module truss 7 can be closed in the opposite direction of the wind flow or moved down to the surface of the earth.

This invention relates to an autonomous method of production, electrical energy from various independent sources of energy production, having different voltages, different power and transmit it over long distances, where consumer receiving points on site will convert the DC electrical signal into the voltage required for the customer, the specified power and set frequency.

The invention makes it possible to unify the manufacturing process of wind turbines, increase their productivity and reduce their production costs for use in any sectors of the national economy, as an autonomous alternative source of electrical energy that can interact with a large energy system.

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DOI 10.34660/INF.2022.18.49.033

TESTING THE DISPERSION EQUATION OF A LONGITUDINALLY MAGNETIZED ELLIPTICAL GYROTROPIC WAVEGUIDE

Itigilov Garma Borisovich
Candidate of Technical Sciences, Head of the Department
Shirapov Dashadondok Shagdarovich
Doctor of Physical and Mathematical Sciences, Professor
East Siberian State University of Technology and Management

Abstract. *By solving the Dirichlet problem for the Helmholtz equations, for the first time, dispersion equations of a longitudinally magnetized elliptic gyrotropic waveguide were obtained, which need testing. In this paper, one of the obtained dispersion equations is tested - the dispersion equation for even waves by limiting the cross – section of an elliptical waveguide to a circle. Thus, the required dispersion equation is reduced to the known dispersion equation for a longitudinally magnetized circular gyrotropic waveguide. This testing showed the correctness of the obtained dispersion equations for a longitudinally magnetized elliptical gyrotropic waveguide.*

Keywords: *elliptical waveguide, gyrotropy, dispersion equation, Mathieu equation, Bessel equation, testing.*

Introduction

In [1], the dispersion equations of even and odd waves of an elliptic gyrotropic waveguide under longitudinal magnetization were obtained for the first time by solving the Dirichlet problem for Helmholtz equations. New dispersion equations need to be tested.

The purpose of the article is to test the dispersion equations of an elliptical gyrotropic longitudinally magnetized waveguide, which was carried out as follows: 1) Reduction of the dispersion equation for even waves of an elliptical gyrotropic waveguide under longitudinal magnetization by limiting the cross-section of the ellipse waveguide into a circle to the dispersion equation for even waves of a similar circular waveguide; 2) Comparison of the reduced dispersion equation with the known dispersion equation for even waves of a circular gyrotropic waveguide with longitudinal magnetization from [2].

The verification of the dispersion equation for odd waves is carried out similarly.

Limit conversion scheme

The dispersion equation for even waves of a longitudinally magnetized elliptical gyrotropic waveguide obtained by [1] is as follows

$$\left[-\left(k_{\perp}^2-\gamma^2-\frac{4q_1}{e^2}\right)\frac{4q_2}{e^2}\frac{Ce_m^{'}(\xi_0,q_1)}{Ce_m(\xi_0,q_1)}+\left(k_{\perp}^2-\gamma^2-\frac{4q_2}{e^2}\right)\frac{4q_1}{e^2}\frac{Ce_m^{'}(\xi_0,q_2)}{Ce_m(\xi_0,q_2)}\right]+$$
$$+j\left[\frac{\gamma^2\varepsilon k a^2\Lambda_1\Lambda_2}{\mu^2}\left\{\frac{ce_m^{'}(\varphi,q_2)}{ce_m(\varphi,q_2)}-\frac{ce_m^{'}(\varphi,q_1)}{ce_m(\varphi,q_1)}\right\}+\frac{\gamma^3\omega\varepsilon k^2}{\mu^2}\left\{\frac{ce_m^{'}(\varphi,q_1)}{ce_m(\varphi,q_1)}\Lambda_1-\frac{ce_m^{'}(\varphi,q_2)}{ce_m(\varphi,q_2)}\Lambda_2\right\}\right]=0, \quad (1)$$

where j is an imaginary number; $k_{\perp}^2=\omega^2\varepsilon\mu_{\perp}$; ω – cyclic frequency; ε – dielectric permittivity of ferrite; $\mu_{\perp}=\frac{\mu^2-k^2}{\mu}$, $\mu=\mu_0-\mu_0\frac{\omega_0\omega_m}{\omega^2-\omega_0^2}$, $k=\mu_0\frac{\omega\omega_m}{\omega^2-\omega_0^2}$ – components of the ferrite magnetic permeability tensor; $\mu_0=4\pi\cdot10^{-7}\frac{Гн}{м}$ – magnetic constant; $\omega_0=\mu_0\mathrm{Y}H_0$ – ferromagnetic resonance frequency; $\mathrm{Y}=1{,}76\cdot10^{11}\frac{Кл}{кг}$ – gyromagnetic ratio; H_0 – the strength of the magnetizing permanent magnetic field; $\mu_{\parallel}\approx\mu_0$; $\omega_m=\mu_0\mathrm{Y}M_0$; M_0 – magnetization of ferrite saturation; γ – constant propagation; $Ce_m(\xi,q_{1,2})$ – even modified Mathieu functions of the 1st kind (with integer index) and their derivatives $Ce_m^{'}(\xi,q_{1,2})$; ξ_0 – boundary ellipse; ε – focal length; α – the large semi-axis of the ellipse; $ce_m(\varphi,q_{1,2})$ – even ordinary Mathieu functions of the 1st kind of the whole order m and their derivatives $ce_m^{'}(\varphi,q_{1,2})$; $\Lambda_{1,2}$ – roots of equation [1]

$$\gamma\omega\varepsilon\frac{k}{\mu}\Lambda^2+\left(\omega^2\varepsilon\mu_{\parallel}-\frac{\mu_{\parallel}}{\mu}\gamma^2-\omega^2\varepsilon\mu_{\perp}+\gamma^2\right)\Lambda-\gamma\omega\mu_{\parallel}\frac{k}{\mu}=0; \quad (2)$$

parameters of Mathieu functions [1]

$$q_{1,2}=\frac{e^2\left(k_{\perp}-\gamma^2-\Lambda_{1,2}\gamma\omega\varepsilon\frac{k}{\mu}\right)}{4}. \quad (3)$$

The equation of the modified Mathieu functions has the form [3]

$$y^{''}-\left(b-2u^2ch2\xi\right)y=0 \quad (4)$$

where $q=u^2>0$ – Mathieu function parameter; b – separation constant. Due to the fact that the parameter of the Mathieu function, according to (3), takes two values, we introduce the notation $q_{1,2}=u_{1,2}^2>0$.

When the ellipse degenerates into a circle, according to [3] $e\to0$, the eccentricity of the ellipse $E=\frac{e}{a}\to0$ and the foci of the ellipse tend to the origin. By $E\to0$ ecliptic coordinate $\xi=ch^{-1}\left(\frac{1}{E}\right)\to\infty$ and at α =const, the ellipse degenerates

into a circle of radius $r = \alpha$ [3] and

$$e \cdot ch(\xi)\Big|_{\substack{e\to 0\\ \xi\to\infty}} \to e \cdot sh(\xi) \to a = r. \tag{5}$$

Also when $\xi \to \infty$

$$ch\xi = \frac{1}{2}\left(\exp(\xi) + \exp(-\xi)\right) \approx \frac{1}{2}\exp(\xi) \tag{6}$$

Then, when $\xi \to \infty$ taking into account (6), the second term in the parenthesis of equation (4) will take the form

$$2u_{1,2}^2 ch2\xi = 2u_{1,2}^2\left(2ch^2\xi - 1\right) \approx 2u_{1,2}^2\, 2ch^2\xi = u_{1,2}^2 \exp(2\xi). \tag{7}$$

To ensure the limitations (7) by $\xi \to \infty$ it is necessary that $u_{1,2} \to 0$. In this case, for the Mathieu function of integer order m, it follows from [3] that $b \to m^2$. Therefore, equation (4) takes the form

$$y'' + \left(u_{1,2}^2 \exp(2\xi) - m^2\right)y = 0 \tag{8}$$

For the Mathieu function, the condition holds [3]

$$4q_{1,2} = 4u_{1,2}^2 = k_1^2 e^2, \text{ where } k_1 - \text{transverse wave number.} \tag{9}$$

At the same time, it follows from (5) and (6) that $r = \frac{e}{2}\exp(\xi)$ by $\xi \to \infty$, then

$$u_{1,2}^2 \exp(2\xi) = \frac{k_1^2 e^2}{4}\exp(2\xi) = k_1^2 \frac{e}{2}\exp(\xi)\frac{e}{2}\exp(\xi) = k_1^2 r^2. \tag{10}$$

When substituting (10) into (8) and at $\xi \to \infty$ the transition to the cylindrical coordinate system is carried out and equation (7) is transformed into the Bessel equation

$$\frac{d^2y}{dr^2} + \frac{1}{r}\frac{dy}{dr} + \left(k_1^2 - \frac{m^2}{r^2}\right)y = 0, \tag{11}$$

solutions of which are expressed in terms of Bessel functions of the 1st kind $J_m(k_1 r)$ and the 2nd kind $Y_m(k_1 r)$. By $\xi \to \infty$ out of limitation $u_{1,2}^2 \exp(2\xi)$, according to (7), and from (10) it follows that $k_1 r$ has a finite value and the solution of the Mathieu equation (4) differs from the solution of the Bessel equation (11) only by constant factors [3].

Thus, there are the following degeneracy functions for modified Mathieu functions at $\xi \to \infty$ [3]

$$\begin{cases} Ce_m(\xi, q) \to P_m' J_m(k_1 r); \quad m \ge 0 \\ Se_m(\xi, q) \to S_m' J_m(k_1 r); \quad m \ge 1 \\ \dfrac{d}{d\xi} Ce_m(\xi, q) \to P_m' r \dfrac{d}{dr} J_m(k_1 r) = P_m' k_1 r J_m'(k_1 r); \quad m \ge 0 \\ \dfrac{d}{d\xi} Se_m(\xi, q) \to S_m' r \dfrac{d}{dr} J_m(k_1 r) = S_m' k_1 r J_m'(k_1 r); \quad m \ge 1, \end{cases} \tag{12}$$

where P_m', S_m' – constant multipliers.

In the case of ordinary Mathieu functions when an ellipse degenerates into a circle, we have [3]

$$\begin{cases} ce_m(\eta,q) \to \cos(m\eta) = \cos(m\varphi) = \exp(\pm jm\varphi), \quad m \geq 1 \\ se_m(\eta,q) \to \sin(m\eta) = \sin(m\varphi). \quad m \geq 1 \end{cases} \tag{13}$$

It follows from [3] that the solutions of the Bessel equation (11) for a circular waveguide have the form

$$\psi = AJ_m(k_1 r)\cos(m\varphi), \tag{14}$$

where A – constant.

According to (3) and (9) we have

$$\begin{cases} k_{1(1)}^2 = k_\perp^2 - \gamma^2 - \Lambda_1 \omega\gamma\varepsilon\dfrac{k}{\mu} = \omega^2\varepsilon\dfrac{\mu^2 - k^2}{\mu} - \gamma^2 - \Lambda_1\omega\gamma\varepsilon\dfrac{k}{\mu}; \\ k_{1(2)}^2 = k_\perp^2 - \gamma^2 - \Lambda_2 \omega\gamma\varepsilon\dfrac{k}{\mu} = \omega^2\varepsilon\dfrac{\mu^2 - k^2}{\mu} - \gamma^2 - \Lambda_2\omega\gamma\varepsilon\dfrac{k}{\mu} \end{cases} \tag{15}$$

Conversion results

Now we will transform the dispersion equation for even waves of a gyrotropic elliptical waveguide with longitudinal magnetization (1) to the corresponding equation for a circular waveguide by limiting the ellipse to a circle, i.e. for the case $\xi \to \infty$. Then the expressions in the first square using (9) and (15), after the corresponding transformations, will take the form

$$\begin{aligned} &\left[-\left(k_\perp^2 - \gamma^2 - \frac{4q_1}{e^2}\right)\frac{4q_2}{e^2}\frac{Ce_m'(\xi_0,q_1)}{Ce_m(\xi_0,q_1)} + \left(k_\perp^2 - \gamma^2 - \frac{4q_2}{e^2}\right)\frac{4q_1}{e^2}\frac{Ce_m'(\xi_0,q_2)}{Ce_m(\xi_0,q_2)}\right] = \\ &= -(k_\perp^2 - \gamma^2 - k_{1(1)}^2)k_{1(2)}^2 k_{1(1)} r_0 \frac{J_m'(k_{1(1)}r_0)}{J_m(k_{1(1)}r_0)} + (k_\perp^2 - \gamma^2 - k_{1(2)}^2)k_{1(1)}^2 k_{1(2)} r_0 \frac{J_m'(k_{1(2)}r_0)}{J_m(k_{1(2)}r_0)} \end{aligned} \tag{16}$$

where r_0 – radius of the circular waveguide.

The expression in the second square bracket will take the form

$$\begin{aligned} &j\left[\frac{\gamma^2\varepsilon k a^2 \Lambda_1\Lambda_2}{\mu^2}\left\{\frac{ce_m'(\varphi,q_2)}{ce_m(\varphi,q_2)} - \frac{ce_m'(\varphi,q_1)}{ce_m(\varphi,q_1)}\right\} + \frac{\gamma^3\omega\varepsilon k^2}{\mu^2}\left\{\frac{ce_m'(\varphi,q_1)}{ce_m(\varphi,q_1)}\Lambda_1 - \frac{ce_m'(\varphi,q_2)}{ce_m(\varphi,q_2)}\right\}\right] = \\ &= \pm\left[\frac{\gamma^3\omega\varepsilon k^2}{\mu^2} m(\Lambda_2 - \Lambda_1)\right]. \end{aligned} \tag{17}$$

After combining (16), (17) and dividing the resulting result by $k_{1(1)}k_{1(2)}$, we will have

$$-\left(k_\perp^2 - \gamma^2 - k_{1(1)}^2\right)k_{1(2)} r_0 \frac{J_m'\left(k_{1(1)}r_0\right)}{J_m\left(k_{1(1)}r_0\right)} + \left(k_\perp^2 - \gamma^2 - k_{1(2)}^2\right)k_{1(1)} r_0 \frac{J_m'\left(k_{1(2)}r_0\right)}{J_m\left(k_{1(2)}r_0\right)} \mp m\gamma^3\omega\varepsilon\frac{k^2}{\mu^2}\frac{\Lambda_2 - \Lambda_1}{k_{1(1)}k_{1(2)}} = 0 \tag{18}$$

From (15) it can be obtained that

$$\Lambda_2 - \Lambda_1 = \frac{k_{1(1)}^2 - k_{1(2)}^2}{\omega\gamma\varepsilon\dfrac{k}{\mu}}. \qquad (19)$$

Substituting (19) into (18) and multiplying all the resulting expression by -1, we get

$$-\left(k_{1(1)}^2 + \gamma^2 - k_\perp^2\right)k_{1(2)}r_0\frac{J_m'\left(k_{1(1)}r_0\right)}{J_m\left(k_{1(1)}r_0\right)} + \left(k_{1(2)}^2 + \gamma^2 - k_\perp^2\right)k_{1(1)}r_0\frac{J_m'\left(k_{1(2)}r_0\right)}{J_m\left(k_{1(2)}r_0\right)} \pm m\gamma^2\frac{k}{\mu}\frac{k_{1(2)}^2 - k_{1(1)}^2}{k_{1(1)}k_{1(2)}} = 0 \qquad (20)$$

Expression (20) completely coincides with the formula obtained in [2] for a gyrotropic circular waveguide with longitudinal magnetization. Different signs before the last term correspond to waves with different rotations.

Conclusion

The paper tests, for the first time, the dispersion equation of even waves obtained in [1] for a longitudinally magnetized elliptical gyrotropic waveguide (1) by limiting the cross–section of the ellipse waveguide to a circle and comparing the resulting equation with a known analogous equation for a circular gyrotropic waveguide with longitudinal magnetization [2]. The comparison showed the correctness of the dispersion equation (1).

Similarly, the dispersion equation of odd waves is tested for a longitudinally magnetized elliptical gyrotropic waveguide.

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INTERNATIONAL SCIENTIFIC SOLUTIONS 2022

New York 2022

Signed in print 18.02.2022. 60x84/16.
Ed. No. 1. Circulation of 500 copies.
Infinity publishing, LLC. 2022.